

Gelli Ffrydiau Hydro Scheme 1, Nantlle, Gwynedd

Archaeological Desk Based Assessment

Project Code: A0005

Report no. 0004



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Date: 17/01/2013

Client: Greenearth Hydro

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GELLI FFRYDIAU, NANTLLE, GWYNEDD (SCHEME 1) VERSION 2.0: A0005

NON-TECHNICAL SUMMARY

Aeon Archaeology has undertaken an archaeological desk based assessment on behalf of Greenearth Hydro, of a proposed hydro-electric scheme located at Gelli Ffrydiau, Nantlle, Gwynedd. The proposed scheme is to include a power house located at the farm of Gelli Ffrydiau and a 504.0m long penstock (buried pipe), running northeast from the farm to an intake weir located on a tributary of the Afon Drws-y-Coed.

The archaeological desk based assessment identified twelve sites of archaeological and historic interest within, or in close proximity to, the proposed penstock route. The proposed scheme is expected to have a low direct adverse physical impact upon two of these sites, one of which is a drainage gully of unknown importance (feature 12) and one of which is a field boundary of local importance (feature 11).

Site specific recommendations have been given in the report for the avoidance of known archaeology, and where this is not possible, for a watching brief to be maintained during sensitive groundworks. Moreover, it has been recommended that a detailed record be taken of any archaeological remains breached by the proposed scheme and that field wall (feature 12) be reinstated upon the completion of works.

The proposed scheme is not expected to have any indirect non-physical impacts or non-physical visual impacts, except where the intention is to run the penstock along the ground surface for 30.0m in the SAM polygon. In this instance the visual impact when viewing eastward from the historic landscape character area and SAMs is expected to be low adverse to negligible. Where a Scheduled monument will be impacted upon, either physically or non-physically, Scheduled Ancient Monument consent must be obtained from Cadw prior to the commencement of works.

The potential to encounter buried archaeological remains during the groundworks is expected to be high within the most northern field and low for the rest of the scheme. As such recommendations have been made for an intensive watching brief during groundworks within the northern field. Furthermore, Cadw and the SNPA archaeologist have requested that a hand-dug trial trench be placed across the projected route of the relict revetment wall and trackway SAM (feature 4) in proximity of the proposed penstock route. This would be required to be undertaken prior to the commencement of work on site and will ascertain whether there are any unknown buried remains in this area.

1.0 INTRODUCTION

Aeon Archaeology was asked by Greenerth Hydro to undertake an archaeological desk based assessment of a proposed hydro-electric scheme located at Gelli Ffrydiau, Nantlle, Gwynedd as part of a planning application (ref: **NP3/22/29B**). The proposed scheme is to include a power house located at the farm of Gelli Ffrydiau (NGR **SH 52257 53550**) and a 504.0m long penstock (buried pipe), running northeast from the farm to an intake weir located on a tributary of the Afon Drws-y-Coed (NGR **SH 52467 53964**) (Figure.1).

The pipe will be made from 180mm (external diameter) HDPE black plastic buried to a depth of 500mm where possible. Approximately 30.0m length of pipe will be required to run through the Scheduled Ancient Monument polygon of the *Hut Circles and field systems north east of Gelli Ffrydiau* (Cn179) and it had been agreed with the Snowdonia National Park Authority (SNPA) archaeologist and Cadw that this section of pipe will be run overground. The pipe will not require any excavation or anchoring and the pipe will be disguised by covering it with a small amount of soil and hessian fabric impregnated with grass seed.

This desk-based assessment report was updated after consultation with the Snowdonia National Park Authority (SNPA) archaeologist, Cadw, and the client. The impacts of the proposed scheme and the recommendations made are those which are most applicable to the application for Scheduled Monument Consent (SMC). This report is version 2.0 and supersedes version 1.1.

2.0 AIMS

This archaeological desk based assessment is for the proposed development area, which included the intake weir location, penstock route, turbine house, and cable route. Due to the proximity of a number of important archaeological sites to the proposed penstock route, an assessment corridor measuring 60.0m centred on the route was assessed for archaeological remains. Where the penstock route ran close to the tributary of the Afon Drws-y-Coed to the east, the assessment corridor was extended westward to incorporate approximately 60.0m of land take.

As part of the archaeological assessment a 1.0km search area centred on the penstock route was utilised for a search of the Gwynedd Historic Environment Record (HER). This provided a background historical narrative of the area and included source material from the Royal Commission on the Ancient and Historic Monuments in Wales (RCAHMW) and Cadw.

3.0 SPECIFICATION AND PROJECT DESIGN

A detailed brief was not prepared for this project by the Snowdonia National Park Authority (SNPA) archaeologist John Roberts, but verbal recommendation was given by the SNPA archaeologist and Cadw to the client to commission an archaeological desk based assessment (Client email correspondence dated 02/01/2013)

The following report conforms to the guidelines specified in *Standard and Guidance for Archaeological Desk-based Assessment* (Institute of Field Archaeologists, 1994, rev. 2007).

The archaeological desk-based assessment considered the following:

- (i) The history of the site;
- (ii) The assessment of impact of development on archaeological remains;
- (iii) The assessment of impact of development on the setting of sites of archaeological importance;

- (iv) The requirements for further assessment in the form of non-intrusive and intrusive field evaluation.

The archaeological desk-based assessment was undertaken in four stages:

- (i) Archival research
- (ii) Site walkover including environmental hand auger transects
- (iii) Written report
- (iv) Project archive

4.0 METHODS AND TECHNIQUES

4.1 Archival research

The archaeological desk-based assessment involved the study of the following records:

- (i) The regional Historic Environment Record (Gwynedd Archaeological Trust, Craig Beuno, Garth Road, Bangor, LL57 2RT) was examined for information concerning the study area. This included an examination of the core HER, and secondary information held within the record which included unpublished reports, the 1:2500 County Series Ordnance Survey maps, the National Archaeological Record index cards and aerial photography if relevant.
- (ii) The National Monuments Record (NMR RCAHMW, National Monuments Record of Wales, Plas Crug, Aberystwyth, SY23 1NJ) was checked for sites additional to the HER, including aerial photography, and additional supporting information will be examined at the NMR if useful.
- (iii) Information about Listed Buildings and Scheduled Ancient Monuments from Cadw was examined in the regional HER. The Register of Outstanding and Special Historic Landscapes and the Register of Parks and Gardens was checked, as well as the location of World Heritage Sites.
- (iv) The National Library of Wales (Aberystwyth) was checked for information concerning the study area and monuments within close proximity.
- (v) Secondary sources were examined, including the Inventories of the (RCAHMW), and works held within the regional libraries. Indices to relevant journals, including county history and archaeology society journals, as well as national society journals were checked. In addition topographical dictionaries, antiquarian tours and trade directories were examined where relevant.
- (vi) Historic aerial photographs from the Welsh Government were obtained and examined for sites that have been demolished and/or sites which were visible only as cropmarks. All photographs examined are listed in the assessment report.
- (vii) The Gwynedd Archives (Caernarfon) was searched for archive maps, including estate and tithe maps as well as information from Land Tax Assessments.
- (viii) The Denbighshire Archives (Ruthin) was searched for estate maps belonging to the Kinmel Hall Estate.
- (ix) Results from previous archaeological work within the area were also reviewed.

4.2 Site walkover

The site walkover was carried out on Friday 11th January 2013 by Richard Cooke BA MA MIFA, archaeological contractor and consultant at Aeon Archaeology. The weather conditions were ideal for the field search being both bright and clear.

A meeting was held on site on 28th February 2013 with the Snowdonia National Park Authority (SNPA) archaeologist, Cadw, the client, and Aeon Archaeology after the production of the first archaeological desk-based assessment report (version 1.1). After consultation the pipe route was altered to avoid and minimise impact upon known and suspected archaeological remains, the results of which are presented in this version of the report (version 2.0).

4.3 Written report

All identified features were assessed and allocated to categories of international, national, regional/county, local and none/unknown importance as listed in Appendix 2. These are intended to give an idea of the importance of the feature and the level of response likely to be required; descriptions of the features and specific recommendations for further assessment or mitigatory measures, as appropriate, are given in the relevant sections of this report. The criteria used for allocating features to categories of importance are based on existing statutory designations and, for non-designated assets, the Secretary of State's non-statutory criteria for Scheduling Ancient Monuments; these are set out in National Planning Policy Framework (NPPF).

3.4 Definitions

Definitions of Impact, evaluation methods and mitigation methods as used in the gazetteer (section 5 below) can be found in Appendix 2.

4.0 THE STUDY AREA

4.1 Topographic Description

The proposed hydro-electric scheme location, including penstock route, is located in close proximity to the western bank of a tributary of the Afon Drws-y-Coed, on the south-western slopes of Mynydd Mawr, within the Snowdonia National Park Authority (SNPA). The tributary runs from northeast to southwest before feeding into the Afon Drws-y-Coed, which is fed from Llyn Nantlle Uchaf within Dyffryn Nantlle. The turbine house is to be located on the farm of Gelli Ffrydiau which lies at the foot of the slope, and approximately 1.2km east of the village of Nantlle, Gwynedd (NGR **SH 52257 53550** to NGR **SH 52467 53964**). The site lies within the civil parish of Llandwrog (upper).

The proposed penstock route is 504.0m in length and will be orientated from northeast to southwest, following the natural downward slope towards the valley floor. The landscape is dominated by enclosed and semi-enclosed fields utilised for sheep and cattle grazing, and interspersed with occasional rocky outcrops. The vegetation is limited to short upland grasses with occasional wetland sedge towards wetter areas around streams.

The bedrock geology is of the Nant Ffrancon subgroup. A siltstone sedimentary bedrock which formed approximately 449 to 485 million years ago in the Ordovician Period within an environment previously dominated by shallow seas (British Geological Survey).

4.2 Statutory and non-statutory designations

The proposed development area was included within the Caernarfon-Nantlle Historic Landscape Characterisation report by the Gwynedd Archaeological Trust (report 402). The site lies within or in close proximity to the following areas/ sites:

- (i) Within the Snowdonia National Park Authority (SNPA).
- (ii) Listed within the Register of Landscapes of Outstanding Historic Interest in Wales (ICOMOS UK) *Dyffryn Nantlle* Historic Landscape Area (HLW(Gw)9), specifically within the *Mynydd Cilgwyn- Moel Tryfan- Moel Smytho* Historic Landscape Character Area (HLCA 14) (figure 10).
- (iii) Partially within and in close proximity to the Roman *Hut Circles and field systems north east of Gelli Ffrydiau* Scheduled Ancient Monument (CN179; PRN 2791).
- (iv) Approximately 350.0m west of the *Small Fort near Nantlle* prehistoric hillfort Scheduled Ancient Monument (CN178; PRN 2781).
- (v) Approximately 400.0m southeast of the Roman *hut group, Geulan, northeast of Nantlle* (CN179; PRN 2789 and 2794).
- (vi) Approximately 700.0m southeast of the *enclosure southeast of Caeronwy-Uchaf* Scheduled Ancient Monument (CN179; PRN 2798).
- (vii) Approximately 800.0m south of the Roman platform hut southeast of Castell-Caeronwy Scheduled Ancient Monument (CN179; PRN 2792).
- (viii) Approximately 850.0m southeast of the *enclosure northeast of Caeronwy-Uchaf* Scheduled Ancient Monument (CN179; PRN 2797).
- (ix) Approximately 850.0m southeast of the *enclosure east of Caeronwy-Isaf* Scheduled Ancient Monument (CN179; PRN 2799).
- (x) Approximately 1.0km southeast of the *enclosure northeast of Caeronwy-Isaf* Scheduled Ancient Monument (CN179; PRN 2795).
- (xi) Approximately 832.0m southeast of the grade II Listed Building of *Caeronwy-isaf* (ref: 22405).
- (xii) Approximately 835.0m southeast of the grade II Listed Building of the *Cowhouse at Caeronwy-isaf* (ref: 22407).
- (xiii) Approximately 1.4km east of the three *Pen yr Orsedd quarry blondins* Scheduled Ancient Monuments (CN208).

The lists of non-designated sites recorded within the Gwynedd Historic Environment Record (HER) are shown on figure 3. Listed Buildings and Scheduled Ancient Monuments (SAMs) are shown on figure 4. Sites from the National Monuments Record (NMR) housed at the Royal Commission on the Ancient and Historic Monuments in Wales (RCAHMW) are shown on figure. 5. The sites are shown with their reference numbers and are listed in Appendix 1.

5.0 THE HISTORICAL CONTEXT

The following sections describe the known archaeological record within the general area of the proposed development. Sites are identified by their PRN number which is the number by which they are identified in the Gwynedd Historic Environment Record (HER), or by their Scheduled Ancient Monument reference, or Listed Building reference numbers if applicable. The intention of this section is to provide a historic and archaeological context to the site. This aids in establishing the relative importance of an archaeological feature within its landscape, as well as assessing the potential for unknown buried archaeological remains on the proposed development site.

5.1 Prehistoric and Roman Period

There is evidence of human occupation within the Nantlle valley since the Bronze Age, and it is likely that the copper deposits at Drws y Coed, approximately 2.2km to the east of the proposed development area, acted as a catalyst for that occupation. Evidence from the Bronze Age is however mostly limited to a scatter of burial cairns (PRN 599, 138, 2780, 1429, 3345, 1829, and 600) and burnt mounds (PRN 1388, 126, and 1389) across the northern slopes of the valley.

Physical evidence becomes more frequent in the Iron Age and Romano-British periods. Approximately 350.0m to the east of the penstock route lies the *Small Fort near Nantlle* prehistoric hillfort Scheduled Ancient Monument (CN178). The monument is situated on a rocky knoll on the western end of a small ridge and is constructed from large stone slabs laid flat and forming an irregular heptagon measuring approximately 22.0m in diameter. An entrance into the fort is located towards the centre of the western side and is now in a ruinous state.

Numerous hut circle sites are found clinging to the upland slopes between the slate quarry of Pen yr Orsedd in the west and Fron quarry in the east. A large area of the south-western slopes of Mynydd Mawr and in close proximity to the study area is included within the Scheduled Ancient Monument of *Hut Circles and field systems north east of Gelli Ffrydiau* (CN 179), and incorporates several clusters of hut circles with associated relict field walls enclosing paddocks. These sites constitute part of a wider relict historic landscape, in which evidence of various periods of settlement and land-use can be recognised. The group value of these early settlements is of particular importance and can be seen as being of national, if not international importance.

The proposed penstock route runs through approximately 30.0m of the south-eastern limit of the Scheduled Ancient Monument area belonging to the *Hut Circles and field systems north east of Gelli Ffrydiau* (CN 179). This scheduled area comprises a land take of approximately 0.53km² and includes the remains of at least twelve separate hut circle settlements belonging primarily to the Romano-British period.

The extensive remains of Romano-British settlement within the Nantlle valley strongly suggest that the area was being exploited at this time for its resources. This would almost certainly have included the quarrying of slate and most likely the mining of copper ore. Undoubtedly food production both on the valley bottom and slopes would also have taken place, and would likely have played an important role in supplying the Roman fort of Segontium at Caernarfon.

5.2 Early Medieval and Medieval Periods

The Early Medieval period is poorly represented within the Nantlle valley. However, by the 12th and 13th centuries the kingdom of Gwynedd was divided into administrative *commotes*, administered through a network of local centres governed by a royal court or *Llys*. The township of a commote associated with a *llys* was known as the *maerdref*, in which the

Prince's agent would reside. The component parts of a llys included the royal hall and other buildings associated with the residence, as well as the royal demesne worked by bond tenants, and the settlements of these tenants which constituted small hamlets. One such llys was located at Baladeulyn in Nantlle, although the precise location of the llys is not known (Govannon report 277). The llys and royal lands became the property of the English King upon the conclusion of the conquest of Wales.

The nearest surviving remains of the Medieval period to the proposed development site includes a possible long hut (PRN 6495) at SH53705350; a platform house (PRN 1412) at SH53975461; and a Medieval field system (PRN 7986) at SH52255479.

5.3 Post Medieval Period

The property of Gelli Ffrydiau is first mentioned in the will of James David, yeoman of Gelli Ffrydiau, dated 1712 (Bangor probate records 1576-1858), in which he bequeathed the property to his wife Angharad Humphries. In addition to this he bequeathed sums of money to his five children and two grandchildren, the former of which included Angharad James. She was noted as being highly educated and was a celebrated early female Welsh poet. Several of her original manuscripts survive in the National Library of Wales and they include an elegy to her son who had died when sixteen years old and another to her husband in the form of an imaginary dialogue. She was also fluent in Latin and learned in the law of the land. She played the harp and according to local tradition would gather her family and servants together to dance before retiring each night. Angharad James moved to Dolwyddelan when she was twenty years old after marrying William Prichard, a man far older than herself, who farmed Cwm Penammen. She continued to farm after she was widowed until her death in 1749.

Part of the land belonging to Gelli Ffrydiau is Rhos Pawl, which is located on the southern side of the valley. Local tradition has it that a lad from Gelli Farm fell in love with a girl from Talymignedd Uchaf, but the girl's father did not approve of the match. The lad pleaded with the father for his daughter's hand in marriage and in the end he agreed on one condition, that the lad would spend a freezing night naked on top of Rhos Pawl, remaining there until morning. The father expected that the lad would give up on the pursuit of his daughter, but instead he accepted the challenge. The lad took a post with him, as well as an axe and mallet and repeatedly hammered the post into the ground through the night to keep his body warm, while the girl kept a lantern burning in her window throughout the night. He succeeded in keeping his body temperature high and thus presented himself to the father and his daughter in the morning, thus winning her hand in marriage (www.nantlle.com).

The property of Gelli Ffrydiau is next mentioned in a sale catalogue dated the 28th June 1808, when it was put up for sale by auction along with the tenant Robert Davies, a sixty-five year old farmer. The landowner at the time is not mentioned and it is not clear who bought the property.

The Llandwrog (upper) parish tithe map of 1849 (figure 6.) depicts the proposed development area rather similarly to how it exists today. The site is depicted as a long strip of land lying to the north of the farm of Gelli Ffrydiau, and flanked to the east and the west by tributaries of the Afon Drws-y-Coed. The land is shown as being divided into two large fields (2151 and 2152) with common land north of the *fridd* wall. The lower of the two fields (2151) is shown as one large field, whereas today the field is divided in two by a north-south field wall. Two smaller fields (2149 and 2150), both of which are in existence today, are depicted either side of the B4418.

Table 1. The tithe apportionment of 1849

Plot	Landowner	Tenant	Plot Name	A/R/P
2149	William Lewis	Catherine	Buarth	10/3/3

	Hughes, Lord Dinorben	Davies of Gelli Ffrydiau	(pasture)	
2150	William Lewis Hughes, Lord Dinorben	Catherine Davies of Gelli Ffrydiau	Cae'r ardd goch (meadow)	4/1/30
2151	William Lewis Hughes, Lord Dinorben	Catherine Davies of Gelli Ffrydiau	Cae'r allt (pasture)	18/1/4
2152	William Lewis Hughes, Lord Dinorben	Catherine Davies of Gelli Ffrydiau	Nant (pasture)	32/1/34

As can be seen from the 1849 tithe apportionment (table 1), the proposed development site was owned by William Lewis Hughes, Lord Dinorben of the Kinmel Hall estate in Denbighshire. He inherited the estate from his father Edward Hughes upon his death in 1815. Edward Hughes had made the family money after marrying Mary Lewis, the daughter of his employer, the Rector of Trefdraeth in Anglesey. She had inherited on the death of her uncle the house of Llysdulas in Anglesey, as well as a 'baron hill' nearby. This hill later became known as the Mynydd Parys (Parys Mountain) copper mine and jointly earned Edward Hughes and Sir Nicholas Baylys a fortune through the demand for copper. Through this Edward Hughes built up a prodigious Estate, the jewel of which was the purchase of Kinmel in 1786.

William Lewis Hughes was made Baron Dinorben of Kinmel in 1831, as well as being MP for Wallingford, Aide de Camp to Queen Victoria, Colonel of the Anglesey Militia, and a champion of the poor, founding a free school for local girls in the grounds of Kinmel Hall in 1830. He died in 1852 and was succeeded by his only surviving son William Lewis Hughes, second Lord Dinorben. He however was invalided and unmarried, and died with no children only eight months after succeeding his father thus leaving the title extinct ([www.Kinmel Estate.co.uk](http://www.KinmelEstate.co.uk)).

The property of Gelli Ffrydiau is mentioned in the Welsh census of 1841 when the farm was tenanted by Catherine Prichard recorded as an eighty year old farmer. Catherine would almost certainly have been a descendant of the marriage between Angharad James and William Prichard in the previous century or through her marriage into the Prichard family. She is recorded as living with her son William (aged fifty) and daughter Mary (aged thirty-five). The property was also home at this time to six agricultural labourers, one shepherd, and one house servant. By the time of the tithe apportionment of 1849 the primary tenant is Catherine Davies and it can only be assumed that Catherine Prichard had remarried or changed her name at the ripe old age of eighty eight. By the time of the Welsh census of 1851 the farm of Gelli Ffrydiau was tenanted by Mary Davis, presumably the former Mary Prichard, daughter of Catherine Prichard Davies.

The tithe apportionment of 1849 names the southernmost field (2149) as *buarth* or playground. This suggests that the field was being utilised by the local school *Ysgol Baladeulyn* located approximately 500.0m to the west. The names of the remaining fields all relate to the terrain of the site.

By the production of the first edition county series Ordnance Survey map in 1889 (figure 7.) the proposed development site is depicted more like it exists today. The first large field to the north of the farm had been subdivided by a north-south field wall with a sheepfold constructed in its north-western corner. Moreover, the weir (feature 7, see section 5.6) had been built across the stream, which by way of a sluice and leat fed water to an overshot wheel for the churning of butter and the threshing of gorse (pers comm. Geraint Ellis, landowner). By this point the current farm house had been built to the south of the original Gelli Ffrydiau house. This building does not appear to be depicted on the 1849 tithe map and it is probable

that it was constructed sometime in the mid to late 19th century. The original farmhouse became dilapidated and was demolished in 2005.

The second and third edition county series Ordnance Survey maps of 1900 and 1915 (figures 8 and 9) respectively, depict the study area the same as the first edition map, and there appears to have been little development of the farm between this time.

5.4 Aerial Photographs

A range of aerial photographs of the proposed development area were examined from the Welsh Government. This included a high level photograph taken by the Royal Air Force in 1946 and 1948, as well as an Ordnance Survey photographs from 1973. Recent aerial coverage of the proposed development area from 2012 was also inspected. The Royal Air Force photographs did not show any new sites and the known sites, such as the *Hut Group and Mining Adit, N of Gelli Ffrydiau* (PRN 2790), were only just recognisable due to the high altitude of the photographs.

The 1973 Ordnance Survey photograph however was of a high resolution and a number of relict field boundaries relating to the *Hut Circles and field systems north east of Gelli Ffrydiau* (CN 179) could be seen. Some of these boundaries were not visible during the site visit, but have been included within the gazetteer of archaeological features (see 5.6 below) identified through documentary evidence.

5.6 Site Gazetteer

The field walkover discovered eight sites of archaeological and historic interest within, or in close proximity to the proposed development corridor, as listed below. A further three sites were identified on the 1973 Ordnance Survey aerial photograph. Each entry contains an assessment of importance, ranked from International through to National, Regional/County, Local, and None. If it is not possible to assess the importance of the site from the visible remains, then it is ranked Unknown. Identified sites were also assigned a level of impact ranked from high through to medium, and low. Levels of impact can be considered as both adverse or beneficial, and can be direct (physically impacting upon a site) or indirect (visually or indirectly physically impacting upon a site). Where it is expected that a site will be impacted upon by the proposed works then mitigation recommendations are provided. All archaeological/historical sites identified are depicted on figure.1. Direction and location of photographs are shown in figure 11.

1. Relict field boundary enclosure SAM (plates 1 and 2)	Category: National	PRN: 36392 SAM: CN179
SH 52436 53982 – SH 52314 54008	Period: Romano-British	Impact: None
<p>A bank measuring approximately 1.0m in width, 0.4m in height, and 125.0m in length runs from east-southeast to west-northwest across the northern part of the field. The bank appears to be a relict field boundary marking the northern limit of the hut circle settlement PRN 2788 and belonging within the SAM polygon CN179. However, the eastern limit of this feature extends out of the SAM polygon to within approximately 37.0m of the intake weir location. The boundary continues to the west-northwest and turns to the southwest where an entrance measuring approximately 3.0m is located. It continues for approximately 85.0m before turning again and returning back towards the stream on a southeast axis for several metres before becoming unidentifiable.</p> <p>The feature does not appear to run any closer to the hydro location on the ground or on the historic aerial photographs, however it may have done originally. It is recommended that it is avoided by plant machinery and a watching brief be maintained during intrusive groundworks</p>		

in this area.
Recommendations for further assessment: None
Recommendations for mitigatory measures: Avoidance and watching brief during intrusive groundworks

2. Possible hut circle (plate 3)	Category: Unknown	PRN: 36393
SH SH 52351 53844	Period: Unknown (Romano-British)	Impact: None
<p>A possible hut circle is located at this point and approximately 10.0m east of the proposed penstock route. The feature appears to have an internal diameter of approximately 4.0m and possible walls covered in turf with occasional stones projecting. It does not lie within the SAM polygon (CN 179) but if proven to be a hut circle should be considered associated with the scheduled settlement.</p> <p>The feature does not lie within the penstock route but should be avoided by any plant machinery and a watching brief should be maintained during intrusive ground works in this area in case of buried associated remains.</p>		
Recommendations for further assessment: None		
Recommendations for mitigatory measures: Avoidance and watching brief during intrusive groundworks		

3. Relict field boundary enclosure SAM (plate 4)	Category: National	PRN: 36394 SAM: CN179
SH 52330 53893 – SH 52323 53814	Period: Romano-British	Impact: None
<p>A relict field boundary measuring approximately 1.0m in width, 0.2m in height, and 80.0m in length runs from north to south and marks the eastern limit of an enclosure belonging to the hut circle settlement PRN 2788 and partially within the SAM polygon CN179. It is constructed from turf but occasional stones mark its route.</p> <p>The feature does not lie within the penstock route but should be avoided by any plant machinery and a watching brief should be maintained during intrusive ground works in this area in case of buried associated remains.</p>		
Recommendations for further assessment: None		
Recommendations for mitigatory measures: Avoidance and watching brief during intrusive groundworks		

4. Relict revetment wall and trackway (plates 5 and 6)	Category: National	PRN: 36395 SAM: CN179
SH 52305 53726 – SH 52246 53734	Period: Romano-British	Impact: None
<p>Several large angular boulders mark a natural cleft in the hillside. Smaller angular stones appear to have been cleared from the plateau above, creating a revetment wall and flat area that may well be a trackway. The feature runs from east to west across the hillside to the hut group and mining adit (PRN 2790) and may have functioned as a trackway leading to the stream.</p> <p>The feature is mostly within the SAM CN179 except for approximately 10.0m of its eastern limit. The feature does not lie within the penstock route but should be avoided by any plant machinery. Furthermore, it has been requested by Cadw and the SNPA archaeologists that a hand-dug trial trench be placed across the projected line of this feature along the penstock route, prior to the commencement of works.</p>		
Recommendations for further assessment: None		

Recommendations for mitigatory measures: Avoidance; hand dug trial trench across the projected line of feature in proximity to the penstock route.

5. Relict field boundary wall SAM (plate 7)	Category: National	PRN: 36396 SAM: CN179
SH 52194 53748 – SH 52261 53721	Period: Romano-British	Impact: None
<p>A relict field boundary measuring approximately 1.0m in width, 0.4m in height, and 72.0m in length meanders from southeast to northwest up the hillside at this point. The north-western end of this boundary leads to the entrance into the hut circle settlement PRN 2788 and is almost certainly a relict boundary wall associated with it. The feature entirely lies within the SAM CN179.</p> <p>This boundary does not lie within the penstock route and should be avoided by the pipe trench and plant machinery. No further assessment or mitigatory measures are proposed.</p>		
Recommendations for further assessment: None		
Recommendations for mitigatory measures: Avoidance		

6. Quarry scoop (plate 8)	Category: Local	PRN: 36397
SH 52291 53704	Period: Post Medieval	Impact: None
<p>A quarry scoop is located at this point orientated from north to south, and measuring approximately 3.0m in width, 1.5m in depth, and 5.0m in length. A mound of spoil is located at its southern edge. The scoop appears to have been in the pursuit of stone, quite possibly for the construction of the nearby weir (feature 7), probably dating to the latter half of the 19th century.</p> <p>This feature lies approximately 40.0m west of the penstock route and should be avoided during intrusive groundworks and plant machinery.</p>		
Recommendations for further assessment: None		
Recommendations for mitigatory measures: Avoidance		

7. Weir (plate 9)	Category: Local	PRN: 36398
SH 52295 53635	Period: Post Medieval	Impact: None
<p>A weir constructed from medium sized angular stone spans the width of the stream at this point. Its function was to supply water via a sluice and leat to an overshot wheel at Gelli Ffrydiau farm, for the churning of milk and threshing of gorse.</p> <p>The weir is first depicted on the Ordnance Survey map of 1889 and was probably constructed in the latter part of the 19th century. The weir lies outside of the development corridor and will not be impacted upon by the proposed scheme.</p>		
Recommendations for further assessment: None		
Recommendations for mitigatory measures: None		

8. Former field boundary wall (plate 10)	Category: Local	PRN: 36399
SH 52255 53631 – SH 52210 53612	Period: Post Medieval	Impact: None
<p>A former field boundary runs from southwest to northeast at the foot of the slope. The boundary is visible by a rough line of medium sized sub-angular stones, and measures approximately 1.0m in width, 0.3m in height, and 47.0m in length. The boundary leads to the entrance into the farmyard and it is most probably a former field boundary marking a trackway into the farm. It is visible on the 1973 aerial photograph.</p>		

The feature lies outside of the development corridor and will not be impacted upon by the proposed development.
Recommendations for further assessment: None
Recommendations for mitigatory measures: None

9. Enclosure	Category: Unknown	PRN: 36400
SH 52266 53637	Period: Unknown	Impact: None
<p>An enclosure measuring approximately 36.0m in length by 28.0m in width, orientated from northwest to southeast is located at this point. This feature was not visible during the site visit and has been identified on the 1973 Ordnance Survey aerial photograph. It is not clear whether this feature represents a Romano-British enclosure as seen higher up the slopes, or whether its proximity to the current farm and former field boundary wall (feature 8) suggests that it is post-medieval in date.</p> <p>The feature lies outside of the development corridor and will not be impacted upon by the proposed development.</p>		
Recommendations for further assessment: None		
Recommendations for mitigatory measures: None		

10. Relict field boundary	Category: National	PRN: 36401
SH 52351 53856	Period: Romano-British	Impact: None
<p>A relict field boundary was identified on the 1973 Ordnance Survey aerial photograph at this location. The boundary is orientated from west-southwest to east-northeast before turning and heading southwest to the suspected hut circle (feature 2). No visible remains of this feature could be seen during the site visit. The proximity of the boundary to the suspected hut circle as well as the relict field boundaries included within the SAM polygon (CN179) strongly suggests that this feature is of Romano-British date.</p> <p>The western limit of this boundary lies in close proximity to the development corridor and it is recommended that a watching brief be maintained during intrusive ground works in this area and a detailed record be taken of any exposed remains. Furthermore, the size of tracked excavators used should be limited to avoid damage to buried remains.</p>		
Recommendations for further assessment: None		
Recommendations for mitigatory measures: Watching brief; detailed record if buried remains found; limit size of tracked excavators.		

11. Drainage gully SAM	Category: Unknown	PRN: 36402 SAM: CN179
SH 52355 53885	Period: Romano-British	Impact: Low adverse direct physical
<p>A drainage gully was identified on the 1973 Ordnance Survey aerial photograph at this location. The gully is orientated from southeast to northwest, it lies within the development corridor and continues into the SAM polygon (CN179). The feature may be a relict boundary belonging to the Romano-British settlement SAM or it could be natural in origin.</p> <p>The gully will require breaching by the penstock route and it is recommended that a watching brief be maintained during intrusive ground works in this area. Furthermore, the size of tracked excavators used should be limited to avoid damage to buried remains.</p>		
Recommendations for further assessment: None		
Recommendations for mitigatory measures: Watching brief; limit size of tracked excavators.		

12. Field boundary wall (plate 11)	Category: Local	PRN: 36403 SAM: CN179
SH 52321 53811	Period: Post-medieval	Impact: Low adverse direct physical
A dry-stone single skin field wall constructed from medium sized sub-angular stones runs from east to west across the proposed development corridor. It measures approximately 1.2m in height and 0.4m in width. The boundary is depicted on the 1849 tithe map as well as on the first, second and third edition Ordnance Survey maps of 1889, 1900, and 1915 respectively. The wall will require breaching via the penstock route, however the actual physical impact will be low adverse direct. A basic record should be taken prior to work commencing, although the photographic and written description included within this report should be seen as being commensurate with a basic record, and as such no further recording work is required. The wall should be reinstated upon the completion of works.		
<i>Recommendations for further assessment:</i> None		
<i>Recommendations for mitigatory measures:</i> Reinstatement		

6.0 IMPACT AND RECOMMENDATIONS

6.1 General recommendations

6.1.1 Direct physical impact (see table 2)

Construction phase

The proposed Gelli Ffrydiau hydro-electric scheme is expected to have a *low direct adverse physical* impact upon two sites (features 11 and 12) of archaeological and historic significance during the construction phase. Feature 11 is a drainage gully which may be associated with the *Hut Circles and field systems north east of Gelli Ffrydiau* Scheduled Ancient Monument (CN179), which would make it of national importance through its group value. However its origin may be natural and thus it is categorised as being of *unknown* importance. Feature 12 is a field boundary wall which is considered to be of *local* importance.

Completion phase

The proposed hydro-electric scheme is not expected to have any further direct physical impact upon any archaeological features upon completion.

6.1.2 Indirect physical and non-physical (visual) impact

Construction phase

The proposed scheme is not expected to have any *indirect physical* impacts upon any of the sites identified in the report during the construction phase.

The proposed scheme is expected to have a *low indirect non-physical (visual)* impact upon all of the sites identified in the report during the construction phase. This part of the project is however time limited and the overall significance of effect during the construction phase upon the archaeological sites, SAMs, and historic landscape character areas will be *low*.

Completion phase

The proposed scheme is not expected to have any *indirect physical* impacts upon any of the sites identified in the report during the completion phase.

The proposed scheme will not have any *indirect non-physical (visual)* impacts during the completion phase due to the burial of the penstock. Where the pipe is to be placed overground for approximately 30.0m in the *Hut Circles and field systems north east of Gelli Ffrydiau* Scheduled Ancient Monument polygon (CN179) it will be disguised using soil and grass seed impregnated hessian. Once the grass had grown it is expected that the *indirect non-physical (visual)* impact of the overground pipe will be *low adverse to negligible*.

6.2 Site Specific Recommendations

Although it is expected that the proposed hydro-electric scheme at Gelli Ffrydiau will impact physically upon two sites of archaeological and historical importance, feature 11 (drainage gully) may be of natural origin and feature 12 (field boundary wall) is of local importance. When it is considered that both of these features are long linear sites, the potential physical impact of the proposed scheme will be *low adverse*. However, there is a potential risk of damage to buried remains through the use of plant machinery, and it is therefore recommended that a limit be placed upon the size of tracked excavators used to reduce the risk of compression damage to sensitive archaeological remains.

The penstock route is proposed to run through approximately 30.0m of the SAM polygon at its south-eastern end. No archaeological remains could be seen in this area during the site visit; however an enclosure of unknown age was seen in this area on the 1973 Ordnance Survey aerial photograph. After consultation with the planning office, the SNPA archaeologists, and Cadw, it has been decided that the most appropriate mitigation at this point would be to overground the 30.0m of pipe through the SAM polygon. This would remove any potential physical impact to buried remains. Moreover, the pipe would be covered with a small amount of soil and hessian impregnated with grass seed, which once germinated would hide the pipe from view.

The site visit and historic aerial coverage identified several field boundaries and a possible hut circle further to the north which currently lie outside of the SAM polygon, but within proximity of the penstock route. The available evidence suggests that the SAM settlement did in fact extend further eastward to the banks of the stream. Due to the proximity of a large quantity of nationally important archaeology, coupled with the identification both during the site visit and on the historic aerial photographs of sites which may have originally continued into the development corridor, the potential for unknown buried remains to be encountered during the works is considered to be *high* within the most northern field and within the 30.0m of SAM polygon. However, due to the narrow width of the penstock trench the expected direct physical impact is expected to be *low adverse*, although this would be dependent upon the nature of archaeological deposits encountered. It is recommended that an intensive watching brief be maintained during sensitive ground disturbance within the most northern field. Furthermore, it is recommended that a detailed record be taken of any archaeological remains breached or uncovered by the groundworks. The breached section of relict field wall (feature 12) should be reinstated upon the completion of works. The potential for unknown buried archaeological remains to be encountered south of the wall, excluding within the SAM polygon, is expected to be *low* and thus no further archaeological monitoring is proposed in this area.

Cadw and the SNPA archaeologist have also requested that a hand-dug trial trench be placed across the projected route of the relict revetment wall and trackway SAM (feature 4) in proximity of the proposed penstock route. This would be required to be undertaken prior to the commencement of work on site and will ascertain whether there are any unknown buried remains in this area.

Where a Scheduled monument will be impacted upon, either physically or non-physically, Scheduled Ancient Monument consent must be obtained from Cadw prior to the commencement of works.

Table 2: Archaeological features					
Number	Name	Category	Impact	Further Assessment	Mitigation Recommendations
1	Relict field boundary enclosure SAM	National	None	None	Avoidance; watching brief during intrusive ground works.
2	Possible hut circle	Unknown	None	None	Avoidance; watching brief during intrusive ground works.
3	Relict field boundary enclosure SAM	National	None	None	Avoidance and watching brief during intrusive groundworks
4	Relict revetment wall and trackway SAM	National	None	None	Avoidance; hand dug trial trench across the projected line of feature in proximity to the penstock route.
5	Relict field boundary wall SAM	National	None	None	Avoidance
6	Quarry scoop	Local	None	None	Avoidance.
7	Weir	Local	None	None	None
8	Former field boundary wall	Local	None	None	None
9	Enclosure	Unknown	None	None	None
10	Relict field boundary	National	None	None	Watching brief; detailed record if buried remains found; limit size of tracked excavators.
11	Drainage gully SAM	National or none	Low adverse direct physical	None	Watching brief; limit size of tracked excavators.
12	Field boundary wall	Local	Low adverse direct physical	None	Reinstatement

7.0 ARCHIVE

The archive consists of field notes, historic maps and photographs taken on the field visit. It is currently held by Aeon Archaeology under the project code **A0005**.

8.0 SOURCES

OS Maps

1st edition 25 inch Ordnance Survey Map of 1889

2nd edition 25 inch Ordnance Survey Map of 1900

3rd edition 25 inch Ordnance Survey Map of 1915

OS 1:10 000 Series sheet SH 55 NE, SH 55 SE, SH 55 SW, and SH 55 NW

Aerial Photographs

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RAF 3G.TUD.UK 193. Frame 6077. 10th May 1946

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Manuscript Sources

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Govannon Consultancy report 277. Dr David Gwyn. 2011. *Afon Craig Las: Archaeological Assessment.*

James David: Will 1712. Bangor Probate Records 1576-1858

Sale Catalogue. XSC0362. *Sale of Gelli Ffrydiau in 1808.*

APPENDIX 1

Sites within 1km of the proposed development area as listed on the Gwynedd HER

prn	name	form	ngr	type	period	Status
15737	Cae Rhonwy and Gelli Ffrydiau - Landscape		SH51745406	Landscape	Multi-Period	-
20537	Trial, Afon Drws Y Coed	Other Structure	SH53005320	Trial Mine	Post-Medieval	-
2781	Small Fort Near Nantlle	Other Structure	SH52595356	Hillfort	Prehistoric	Scheduled Ancient Monument
2783	Axe Hammer - Findspot, Tal-y-mignedd, Dyffryn Nantlle	Document	SH52905300	Findspot	Prehistoric	-
2788	Hut Circles, Field System, N of Gelli Ffrydiau	Multiple	SH52265392	Hut Circle Settlement	Roman	Scheduled Ancient Monument
2789	Hut Group, Geulan, NE of Nantlle	Building - Ruined	SH51995390	Hut Circle Settlement	Roman	Scheduled Ancient Monument
2790	Hut Group and Mining Adit, N of Gelli Ffrydiau	Multiple	SH52165376	Hut Circle Settlement	Roman	Scheduled Ancient Monument
2791	Hut Circles, NE of Gelli Ffrydiau, Nantlle	Building - Ruined	SH52595413	Hut Circle Settlement	Roman	Scheduled Ancient Monument
2792	Platform Hut, SE of Castell-Caeronwy, Nantlle	Building - Ruined	SH52735438	Hut Platform	Roman	Scheduled Ancient Monument
2793	Hut Group, Enclosed, SE of	Multiple	SH52805435	Hut Circle Settlement	Roman	Scheduled Ancient Monument

	Castell-Caeronwy					
2794	Hut Circles and Enclosure, NE of Geulan, Nantlle	Multiple	SH52075412	Hut Circle	Unknown	Scheduled Ancient Monument
2795	Hut Circle, NE of Caeronwy-Isaf, Nantlle	Building - Ruined	SH52135457	Hut Circle	Unknown	Scheduled Ancient Monument
2796	Hut Circles, NE of Geulan, Nantlle	Building - Ruined	SH51985403	Hut Circle Settlement	Roman	Scheduled Ancient Monument
2797	Enclosure, NE of Caeronwy-Uchaf, Nantlle	Other Structure	SH52145437	Enclosure	Unknown	Scheduled Ancient Monument
2798	Enclosure, SE of Caeronwy-Uchaf, Nantlle	Other Structure	SH52055423	Enclosure	Unknown	Scheduled Ancient Monument
2799	Platform Hut, E of Caeronwy-Isaf, Nantlle	Building - Ruined	SH52115443	Hut Platform	Unknown	Scheduled Ancient Monument
33912	Drainage Feature, Possible, Dyffryn Nantlle	Earthwork	SH52245277	Ditch	Modern	-
33913	Footbridge, Dyffryn Nantlle	Other Structure	SH52305280	Footbridge	Modern	-
33914	Field Walls, Dyffryn Nantlle	Other Structure	SH52365275	Field Boundary	Post-Medieval	-
33915	Trackway, Dyffryn Nantlle	Earthwork	SH52575278	Trackway	Post-Medieval	-
5567	Hut Circle and Enclosure, Blaen y Garth, Nantlle	Multiple	SH51615390	Hut Circle	Prehistoric	-
7319	?Circular Feature, E of Llyn Nantlle	Earthwork	SH52205280	Feature	Unknown	-

	Uchaf					
7986	Field System, Castell Caeronwy	Earthwork	SH52255479	Field System	Medieval	-
8469	Area of Cultivation Ridges, E of Llyn Nantlle	Earthwork	SH52045295	Ridge And Furrow	Modern	-
8470	Cottage and Barn, W of Tal Y Mignedd	Building - Roofed	SH52545281	Cottage	Post-Medieval	-

New sites within 1km of the proposed development area as listed on the Gwynedd HER

Prn	Sitename	Ngr	Sitetype	Period
22531	Ffridd cowshed	SH51805276	Cowshed	Post Medieval
22533	Ffridd footbridge 2	SH51985279	Footbridge	Post Medieval
22532	Ffridd footbridge 1	SH51945278	Footbridge	Post Medieval
15990	Platform/terrace, N. of Gelli Ffrydiau	SH52095375	Terrace	Prehistoric/Romano British
15991	Lynchets/field boundaries, NW of Gelli Ffrydiau	SH51925375	Lynchet	Prehistoric/Romano British
15992	Field system, N of Gelli Ffrydiau	SH52175386	Field system	Prehistoric/Romano British
15993	Field system, NE of Gelli Ffrydiau	SH52845390	Field system	Prehistoric/Romano British
15994	Rectangular structure, E of Gelli Ffrydiau	SH52645355	Long hut?, Building	Undetermined
15995	Cairn? E of Gelli Ffrydiau	SH52635356	Cairn	Undetermined
15996	Relict field boundaries, E of Gelli Ffrydiau	SH52575346	Field system	Undetermined
15997	?Trial, Pont y Gelli	SH52315345	Trial?	Post Medieval
15998	Field Barn/Beudy, SW of Gelli Ffrydiau	SH51905345	Barn	Post Medieval

15999	Field Barn, S of Gelli Ffrydiau	SH52075329	Barn	Post Medieval/Modern
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Sites within 1km of the proposed development area as listed on the NMR

Nprn	Nmrwname	Type	Period	Ngr	Community
16872	Tal-Y-Mignedd Isaf	House	Post Medieval?	Sh52945298	Llanllyfni
24298	Llandwrog: Ancient Agriculture	Field System	Medieval	Sh522541	Llandwrog
95369	Small Hillfort North East Of Gelli Ffrydiau Near Nantlle	Hillfort	Iron Age	Sh52595356	Llanllyfni
301029	Hut Group, Geulan, Ne Of Nantlle	Settlement	Roman	Sh51995390	Llandwrog
301046	Hut Group, Geulan, Ne Of Nantlle	Settlement	Roman	Sh51995390	Llanllyfni
287078	South East Of Llyn Ffynhonnau Enclosure	Enclosure	Iron Age	Sh52495494	Llandwrog
287079	East Of Castell Caeronwy Field System	Field System	Iron Age	Sh52505473	Llandwrog
287080	Bryn Castell Farmstead	Farmstead	Post Medieval	Sh52805486	Llandwrog
287081	West Of Bryn Castell Cairnfield	Cairnfield	Prehistoric;Iron Age	Sh52645485	Llandwrog
287082	South West Of Bryn Castell Wall	Wall	Iron Age?	Sh52695482	Llandwrog
287083	South Of Bryn Castell Wall	Wall	Iron Age	Sh52895465	Llandwrog
287084	South Of Bryn Castell Shelter	Shelter	Post Medieval	Sh52815455	Llandwrog
287085	South Of Bryn Castell Cairnfield	Cairnfield	Prehistoric;Iron Age	Sh52735458	Llandwrog
287086	South Of Castell Caeronwy Shelter	Shelter	Post Medieval	Sh52335463	Llandwrog
287087	South Of Castell Caeronwy Enclosure Boundary	Boundary Bank	Iron Age?	Sh52255463	Llandwrog
287088	South Of Castell Caeronwy Boundary Bank And Ditch	Boundary Bank	Iron Age?	Sh52235455	Llandwrog
287089	West Of Castell Caeronwy Boundary Bank And Ditch	Boundary Bank	Iron Age?	Sh52215469	Llandwrog
287090	North East Of Gelli Ffrydiau Field System I	Field System	Iron Age	Sh52625413	Llandwrog

287091	South West Of Craig Y Bera Sheep Fold I	Sheep Fold	Post Medieval	Sh53305423	Llanllyfni
287092	North East Of Gelli Ffrydiau Field System Ii	Field System	Iron Age	Sh52815437	Llandwrog
287285	North East Of Gelli Ffrydiau Clearance Cairn	Clearance Cairn	Post Medieval	Sh52475356	Llanllyfni
287286	North East Of Gelli Ffrydiau Wall	Wall	Post Medieval	Sh52495349	Llanllyfni
287287	Gelli Ffrydiau Platform House	House Platform	Iron Age	Sh52735438	Llandwrog
287288	North East Of Gelli Ffrydiau Structure	Structure	Post Medieval?	Sh52595356	Llanllyfni
287289	North East Of Gelli Ffrydiau Longhouse	Longhouse	Medieval	Sh52685356	Llanllyfni
287290	North East Of Gelli Ffrydiau Hut Circle Ii	Hut Circle	Iron Age	Sh53035366	Llanllyfni
287291	South West Of Craig Y Bera Wall I	Wall	Post Medieval	Sh53455390	Llanllyfni
287296	South West Of Craig Y Bera Wall Iii	Wall	Post Medieval	Sh53395411	Llanllyfni
287297	North East Of Gelli Ffrydiau Field System Iii	Field System	Iron Age	Sh52875384	Llanllyfni
287298	North East Of Gelli Ffrydiau Hut Circle Iii	Hut Circle	Iron Age	Sh52905377	Llanllyfni
302539	Gelliffrydiau, Homestead	Homestead	Roman	Sh52165374	Llanllyfni
302543	Hut S.E Of Caeronwy-Uchaf	Homestead	Roman	Sh52075412	Llandwrog
302545	Caeronwy-Isaf, Enclosed Hut	Homestead	Early Medieval	Sh52135457	Llandwrog
302544	Hut Circle North East Of Gelli Ffrydiau	Hut Circle	Iron Age	Sh52595412	Llandwrog
302542	Gelli Ffrydiau Hut Circle	Hut Circle	Iron Age	Sh52805435	Llandwrog
302540	Caeronwy-Uchaf, Enclosure	Enclosure	Unknown	Sh52145437	Llandwrog
302538	Gelliffrydiau, Round Hut	Hut Circle	Roman	Sh52265392	Llanllyfni
302524	Caeronwy-Uchaf, Round Huts	Hut Circle	Roman	Sh51965403	Llandwrog
415061	Ysgol Baladeulyn, Nantlle	School	Post Medieval	Sh51635349	Llanllyfni

Listed Buildings within 1km of the proposed development area

Number	Name	Locality	Eastings	Northings	Grade
22404	Hafod Caeronwy	Nantlle	252035	354841	II

22405	Caeronwy-Isaf	Nantlle	251864	354454	II
22407	Cowhouse At Caeronwy-Isaf	Nantlle	251857	354467	II
23685	Milestone	Nantlle	251555	353448	II
23714	Milestone	Nantlle	253067	353354	II

Scheduled Ancient Monuments within 1km of the proposed development area

Sam_No	Sam_Name	NGR_X	NGR_Y	Site_Type	General_Pe	Broadclass
Cn179	Huts & Field Systems Ne Of Nantlle	252081	354077	Enclosure	Prehistoric	Monument
Cn178	Small Fort Near Nantlle	252592	353563	Hillfort	Prehistoric	Defence

APPENDIX 2: DEFINITIONS OF IMPORTANCE AND RECOMMENDATION

1. Definition of Categories of importance

The following categories were used to define the importance of the archaeological resource.

Significance	Description
International (Very High)	Archaeological sites or monuments of international importance, including World Heritage Sites. Structures and buildings inscribed as of universal importance as World Heritage Sites. Other buildings or structures of recognised international importance.
National (High)	Ancient monuments scheduled under the Ancient Monuments and Archaeological Areas Act 1979, or archaeological sites and remains of comparable quality, assessed with reference to the Secretary of State's non-statutory criteria. Listed Buildings. Undesignated structures of national importance.
Regional/ County (Medium)	Conservation Areas Archaeological sites and remains which, while not of national importance, score well against most of the Secretary of State's criteria.
Local (Low)	Archaeological sites that score less well against the Secretary of State's criteria. Historic buildings on a 'local list'.
None	Areas in which investigative techniques have produced no or only minimal evidence for archaeological remains, or where previous large-scale disturbance or removal of deposits can be demonstrated.

2. Definition of Impact

The direct impact of the proposed development on each site was estimated. The impact is defined as follows:

Magnitude	Direct Impacts	Indirect Impacts
High Adverse	Complete removal of an archaeological site. Complete destruction of a designated building or structure.	Radical transformation of the setting of an archaeological monument. A fundamental change in the setting of a building.
Medium Adverse	Removal of a major part of an archaeological site and loss of research potential. Extensive alteration (but not demolition) of a historic building or feature, resulting in an appreciable adverse change.	Partial transformation of the setting of an archaeological site (e.g. the introduction of significant noise or vibration levels to an archaeological monument leading to changes to amenity use, accessibility or appreciation of an archaeological site). Partial adverse transformation of the setting of a designated building.
Low Adverse	Removal of an archaeological site where a minor part of its total area	Minor change to the setting of an archaeological monument or historic

Magnitude	Direct Impacts	Indirect Impacts
	is removed but the site retains a significant future research potential. Change to a historic building or feature resulting in a small change in the resource and its historical context and setting.	building.
Negligible/ Neutral	No impact from changes in use, amenity or access. No change in the ability to understand and appreciate the resource and its historical context and setting.	No perceptible change in the setting of a building or feature.
Low Beneficial	Land use change resulting in improved conditions for the protection of archaeological remains or understanding/ appreciation of a historic building or place	Decrease in visual or noise intrusion on the setting of a building, archaeological site or monument. Improvement of the wider landscape setting of a building, archaeological site or monument.
Medium Beneficial	Land use change resulting in improved conditions for the protection of archaeological remains, or understanding/ appreciation of a historic building or place, including through interpretation measures (heritage trails, etc). Removal of harmful alterations to better reveal the significance of a building or structure, with no loss of significant fabric.	Significant reduction or removal of visual or noise intrusion on the setting of a building, archaeological site or monument; and Improvement of the wider landscape setting of a building, archaeological site or monument Improvement of the cultural heritage amenity, access or use of a building, archaeological site or monument.
High Beneficial	Arrest of physical damage or decay to a building or structure;	Exceptional enhancement of a building or archaeological site, its cultural heritage amenity and access or use

3. Definition of field evaluation techniques

Field evaluation is sometimes necessary when the importance of an identified archaeological feature cannot be ascertained via an archaeological desk based assessment alone. There are several different techniques but the three most common are geophysical survey, trial trenching, and supervised metal detector survey:

Geophysical survey

This technique is a non-intrusive form of archaeological field evaluation. It utilises a magnetometer which detects differences within the earth's magnetic field caused by the presence of iron in the soil. This iron often takes the form of magnetised iron oxides in the topsoil which have been re-deposited into lower archaeological features through cutting and backfill. A magnetometer can also detect iron artefacts within the soil and the presence of burnt stone material such as on hearths, kilns, and burnt mounds.

Trial trenching

Where a site is suspected to contain more subtle archaeological features such as pits, a geophysical survey may not be appropriate due to its lack of sensitivity in detecting these features. Indeed, trial trenching can also be utilised when anomalies have been identified during the geophysical survey and clarification is required in order to identify them. Trial trenches usually measure 20m by 2m although can vary in size if targeting geophysical anomalies. Trenches are excavated using a mechanical tracked excavator and supervised by an archaeologist. The topsoil and subsoil are removed onto buried features or if absent, on to the natural glacial substrata. Any archaeological remains found are usually evaluated and recorded prior to backfilling of the trench, so that further site specific mitigatory recommendations can be made.

Supervised Metal Detector Survey

Some types of underlying substrata and bedrock can mask the results of investigation techniques such as geophysical survey. In such instances an archaeologically supervised metal detector survey can be undertaken. This involves the supervision of metal detectorists by a suitably qualified archaeologist and the spatial mapping of artefacts as they are discovered. This technique can give a geographical spread of metal finds and thus be indicative of 'hotspot' areas which may require further investigation by trial trenching for example.

4. Definition of Mitigatory Recommendations

None:

No further action is required.

Detailed recording:

A photographic and concise descriptive record is required, along with a digital survey.

Basic recording:

A photographic and basic descriptive record is required.

Watching brief:

Monitoring is required by a suitably qualified archaeologist during the proposed development. An archaeological watching brief is divided into four categories according to the IFA, 2001. *Institute for Archaeologists 2001 Standard and Guidance for an archaeological watching brief:*

- comprehensive (present during all ground disturbance)
- intensive (present during sensitive ground disturbance)
- intermittent (viewing the trenches after machining)
- partial (as and when seems appropriate).

Avoidance:

These features should be avoided by the proposed development and any ancillary works including the establishment of compound and material lay-down areas. It may be necessary to surround the feature with a barrier and/or signage to avoid accidental damage.

Reinstatement:

These features should be reinstated to their original location and condition. Supervision by an archaeologist is required.

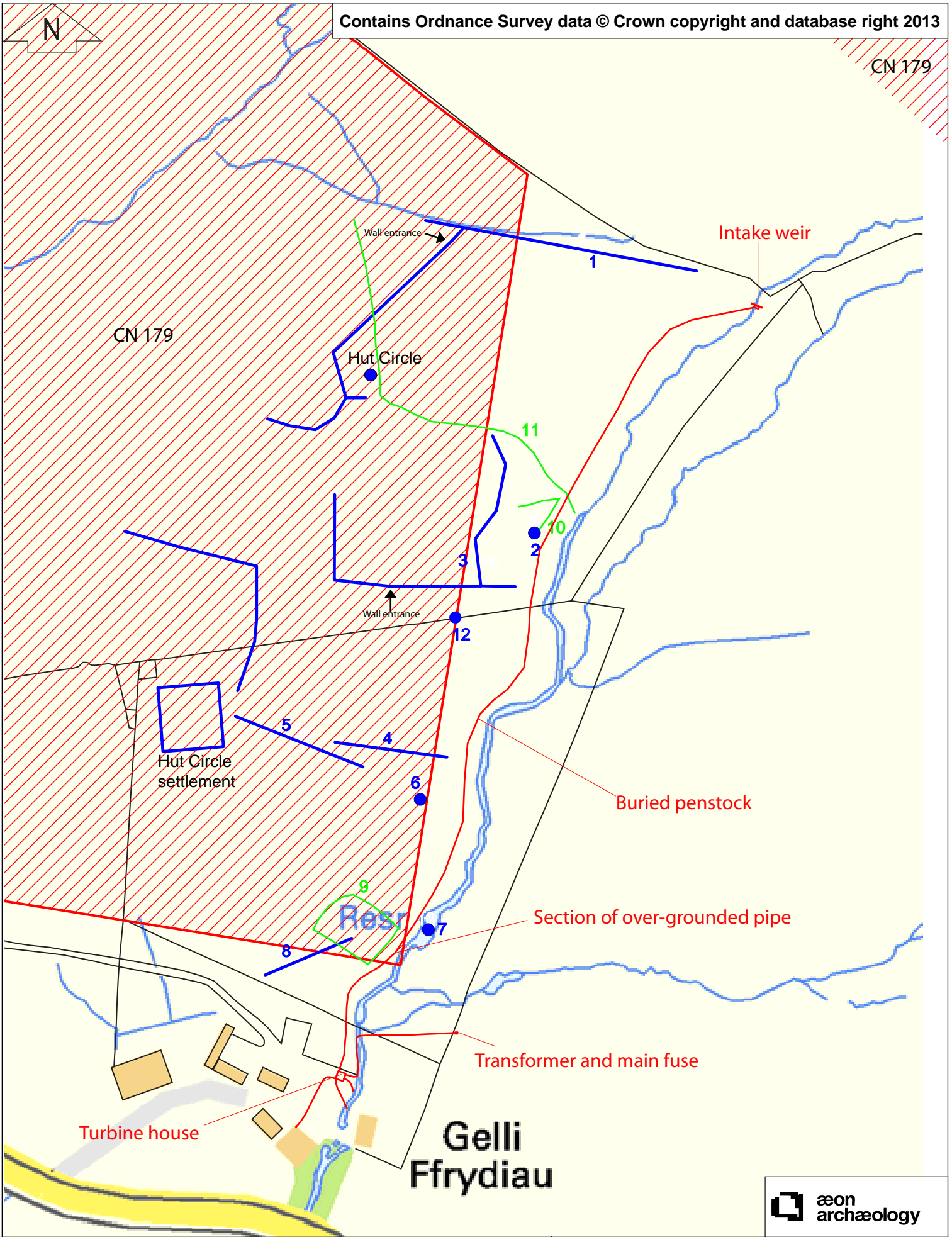


Figure 1: Location of proposed hydro scheme. Scale 1:2,500 at A4. (Sites identified during the field walkover shown in blue; sites identified from aerial photographs shown in green; penstock route shown in red; SAM polygons outlined pink).



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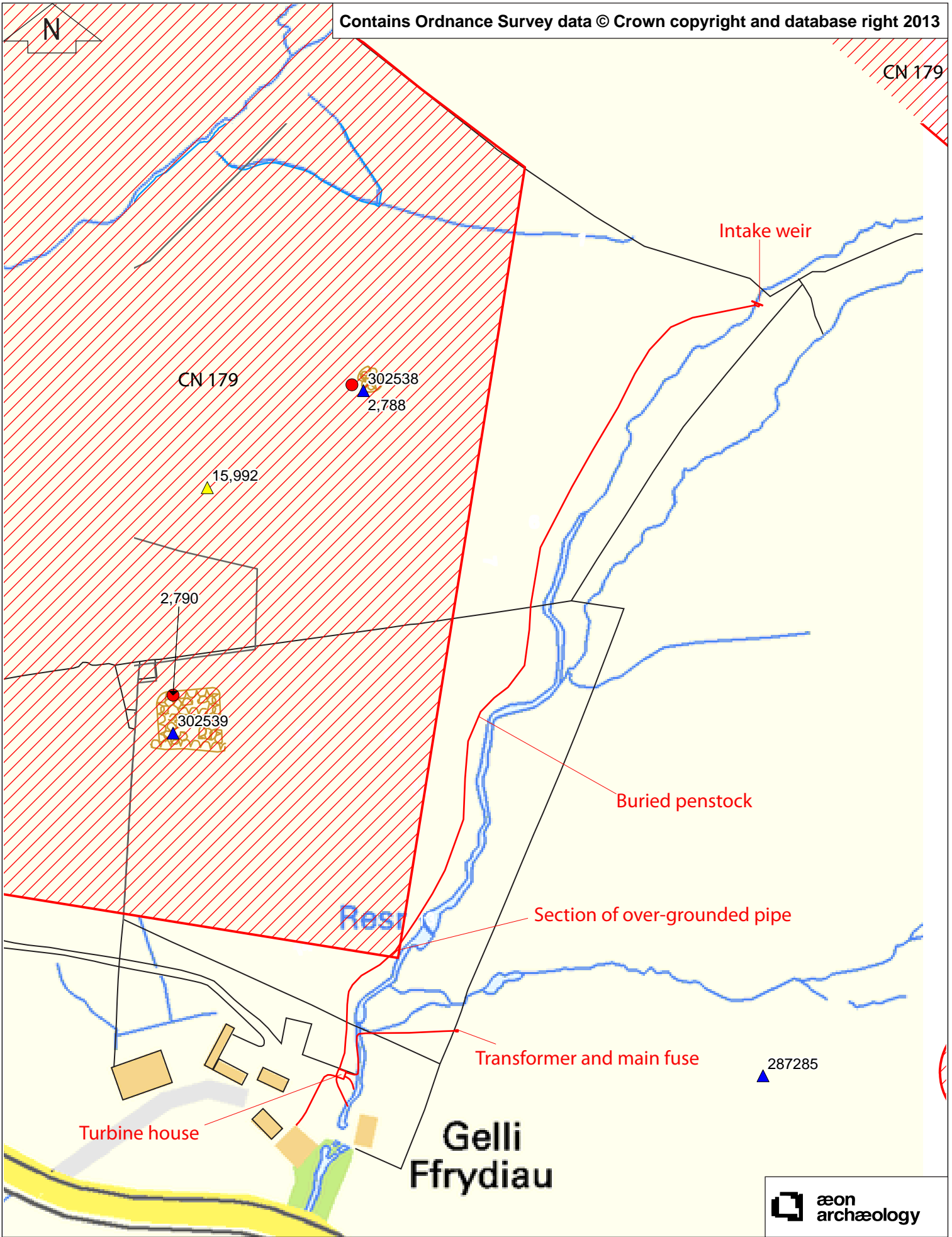
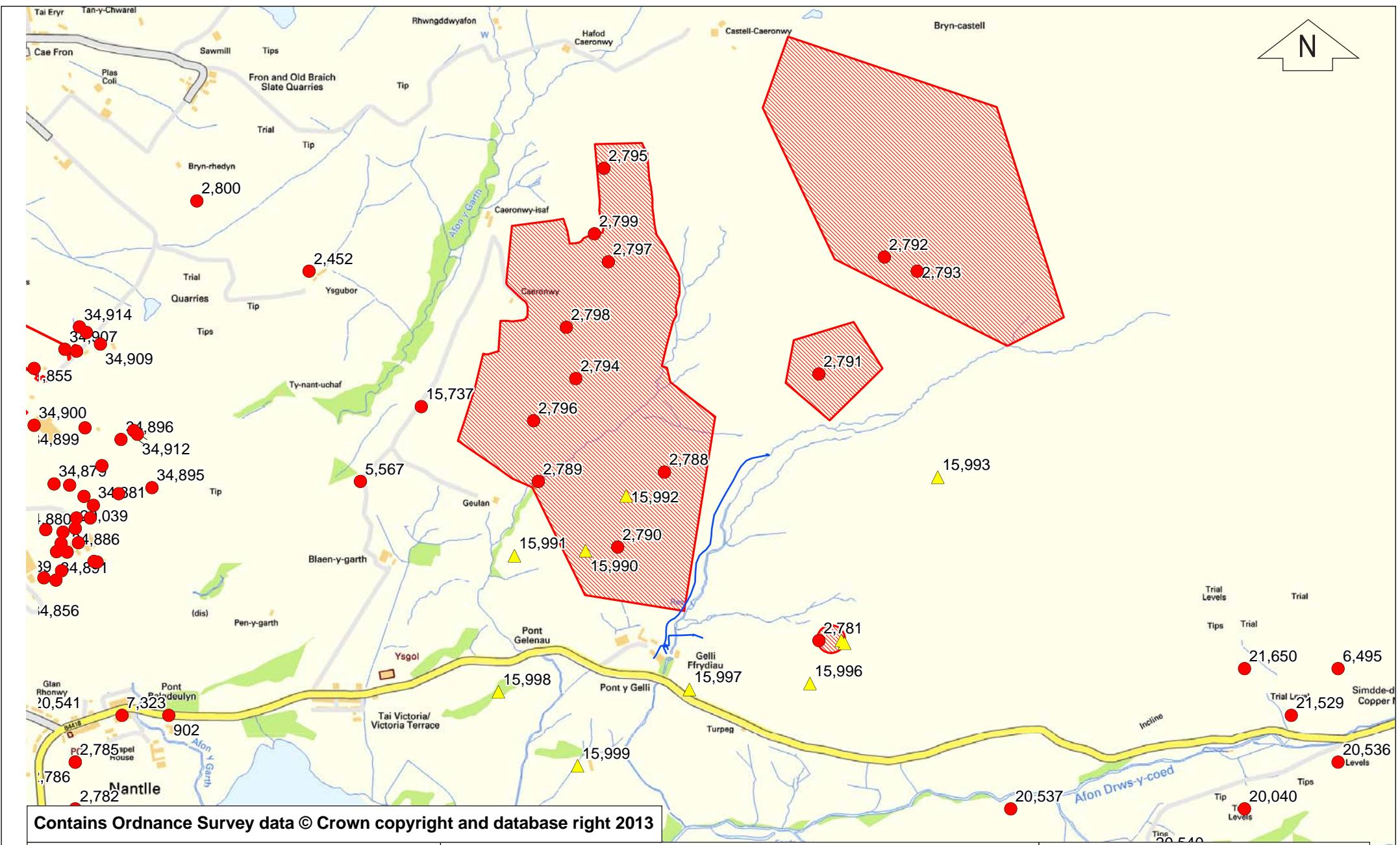


Figure 2: Location of known historic sites (Sites from the HER shown as red dots and yellow triangles; sites from the NMR shown as blue triangles; SAMS shown as red shaded area). Scale 1:2,500 at A4.

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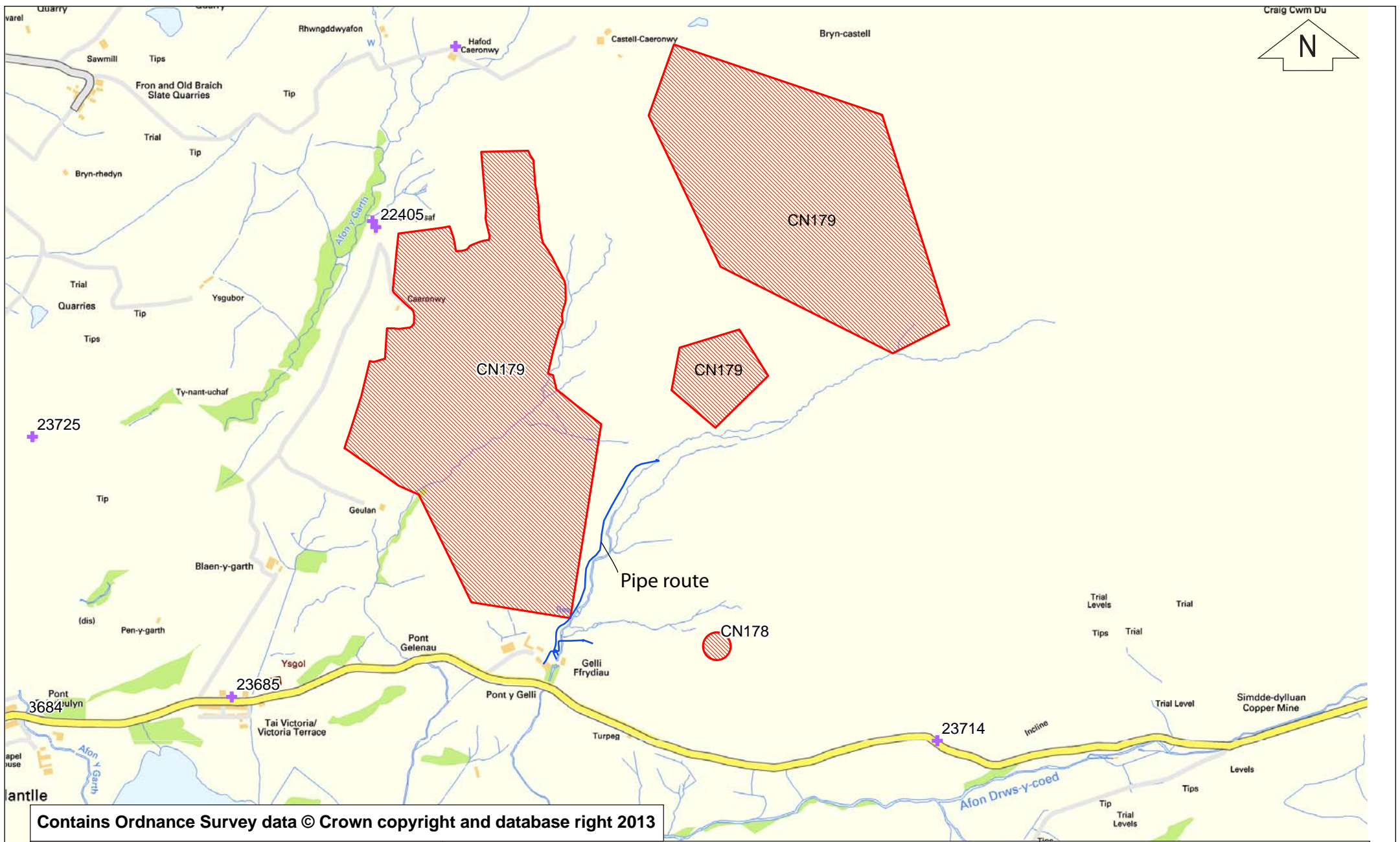


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Figure 3: Location of SAMs and sites from the HER. Scale 1:10,500 at A4. (Sites from the Gwynedd HER shown as red dots and yellow triangles; Scheduled Ancient Monuments shaded red; hydro route shown in blue)

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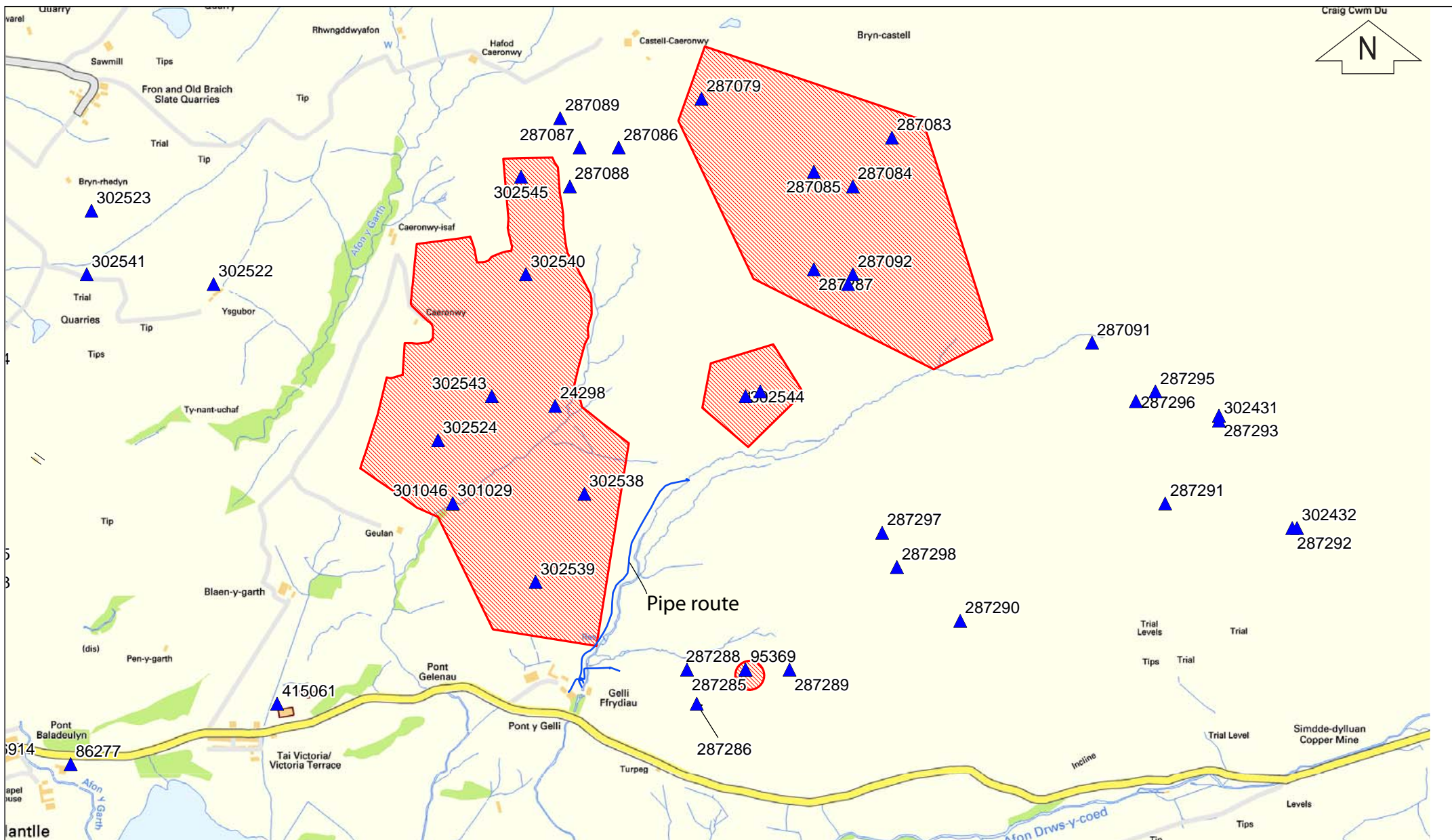


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Figure 4: Location of Listed Buildings and SAMs, scale 1:10,500 at A4.
(Listed Buildings shown as purple crosses; Scheduled Ancient Monuments shaded red; hydro route shown in blue)

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Figure 5: Location of sites from the NMR, scale 1:10,500 at A4.
 (NMR sites shown as blue crosses; Scheduled Ancient Monuments shaded red; hydro route shown in blue)

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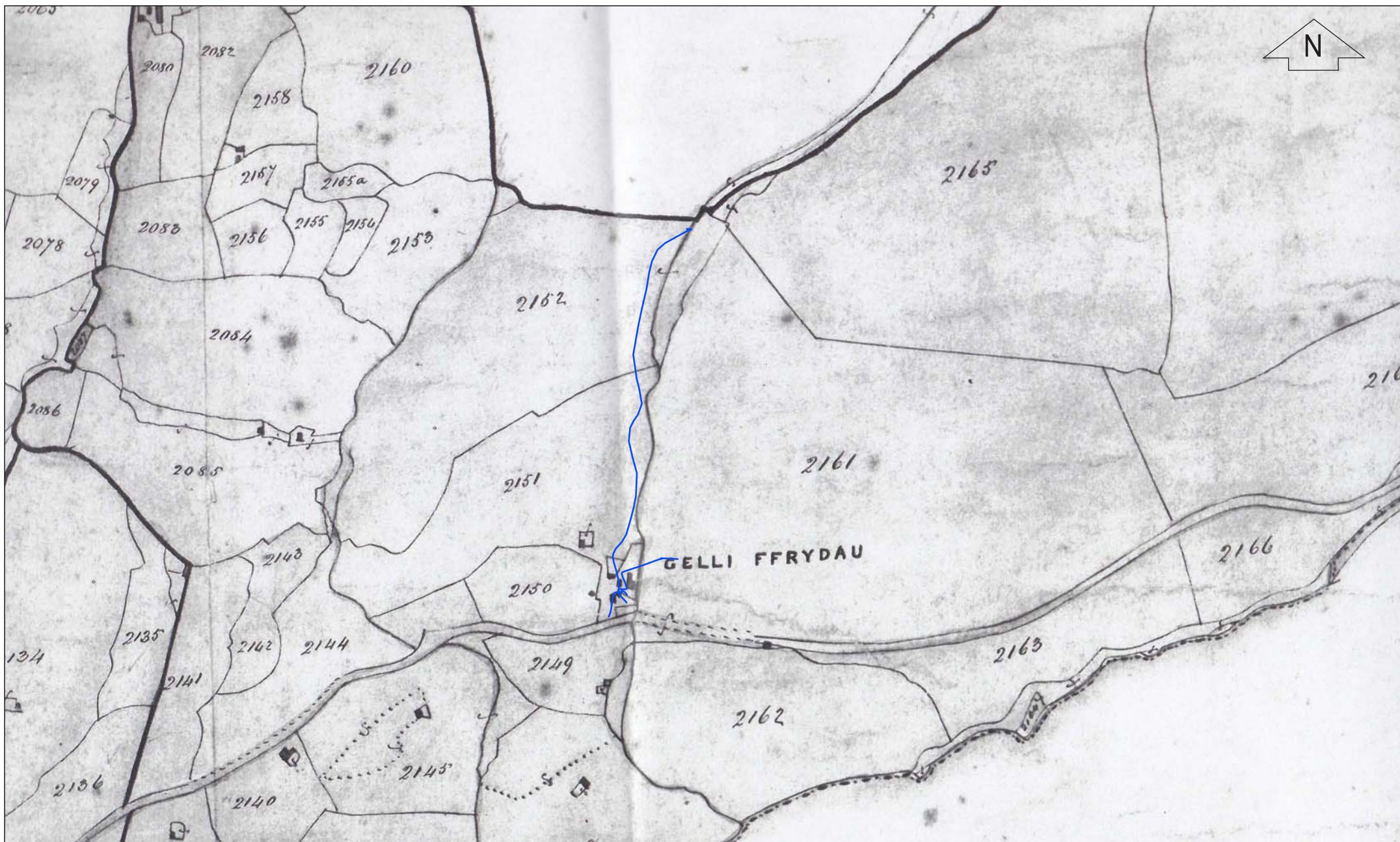


Figure 6: Tithe map of 1849 for the parish of Llandwrog (upper).
(Hydro location shown in blue)

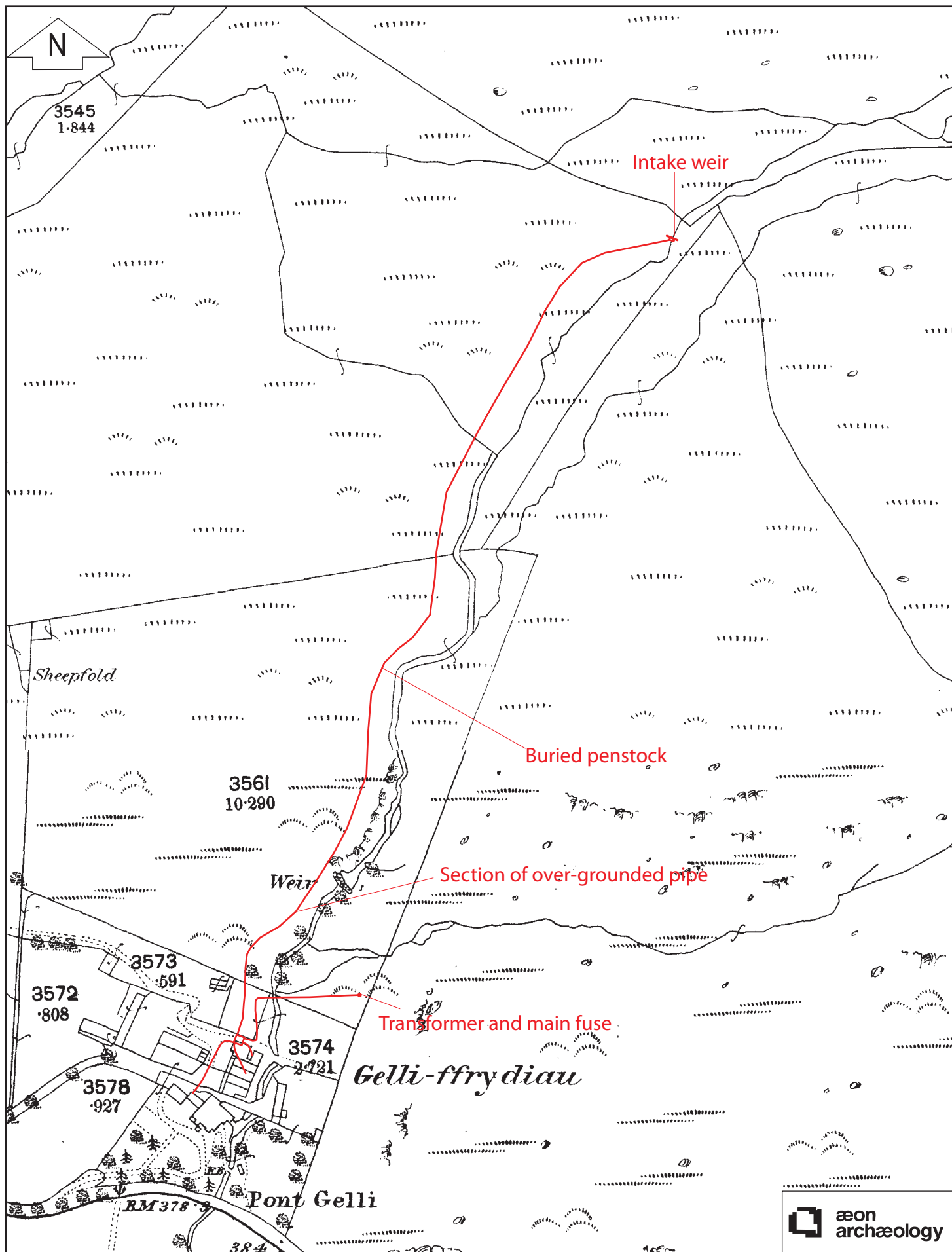


Figure 7: First Edition Ordnance Survey map of 1889 (pipeline route shaded in red). Scale 1:2,500 at A4.

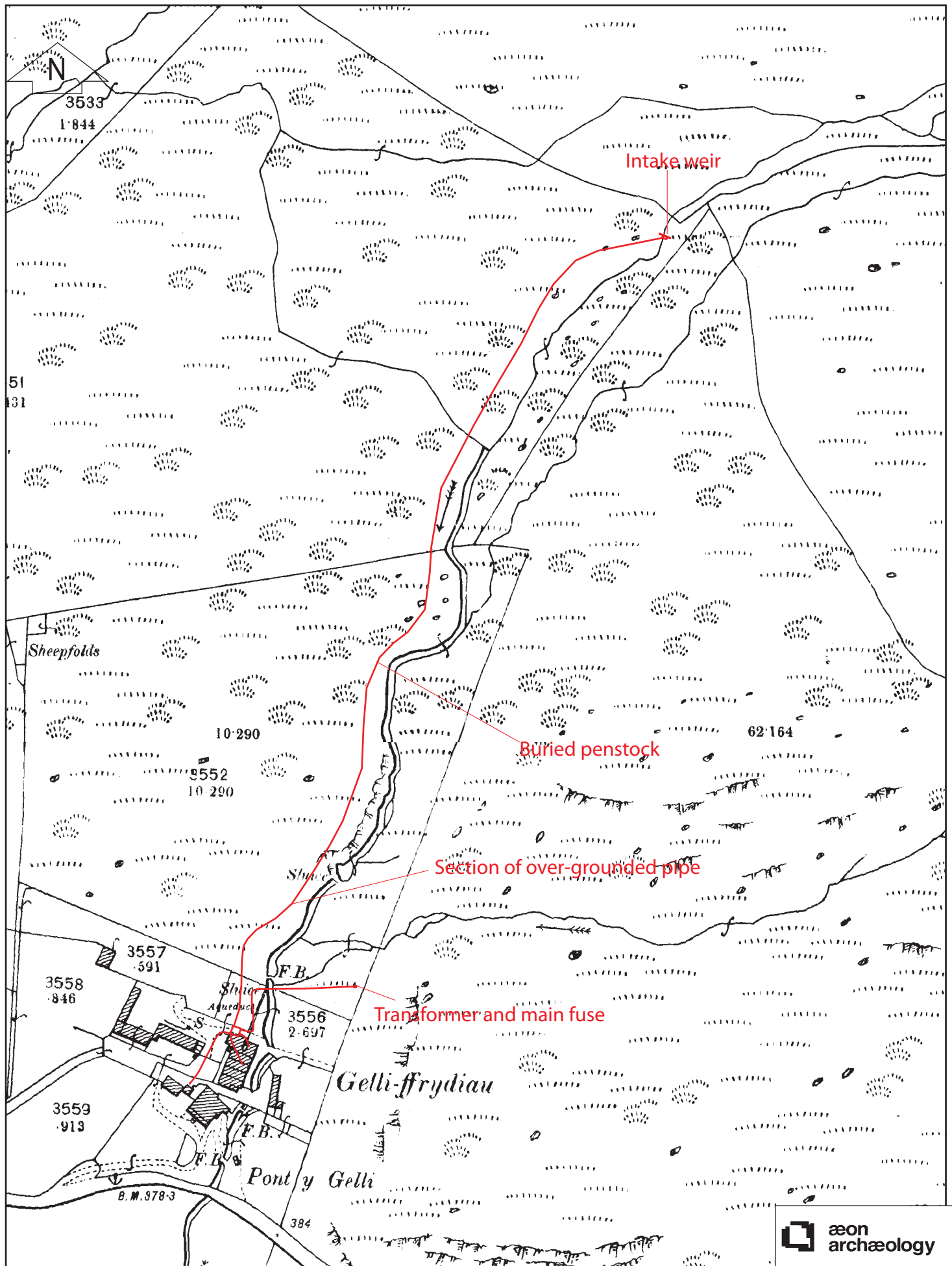


Figure 8: Second Edition Ordnance Survey map of 1900 (pipeline route shaded in red). Scale 1:2,500 at A4.

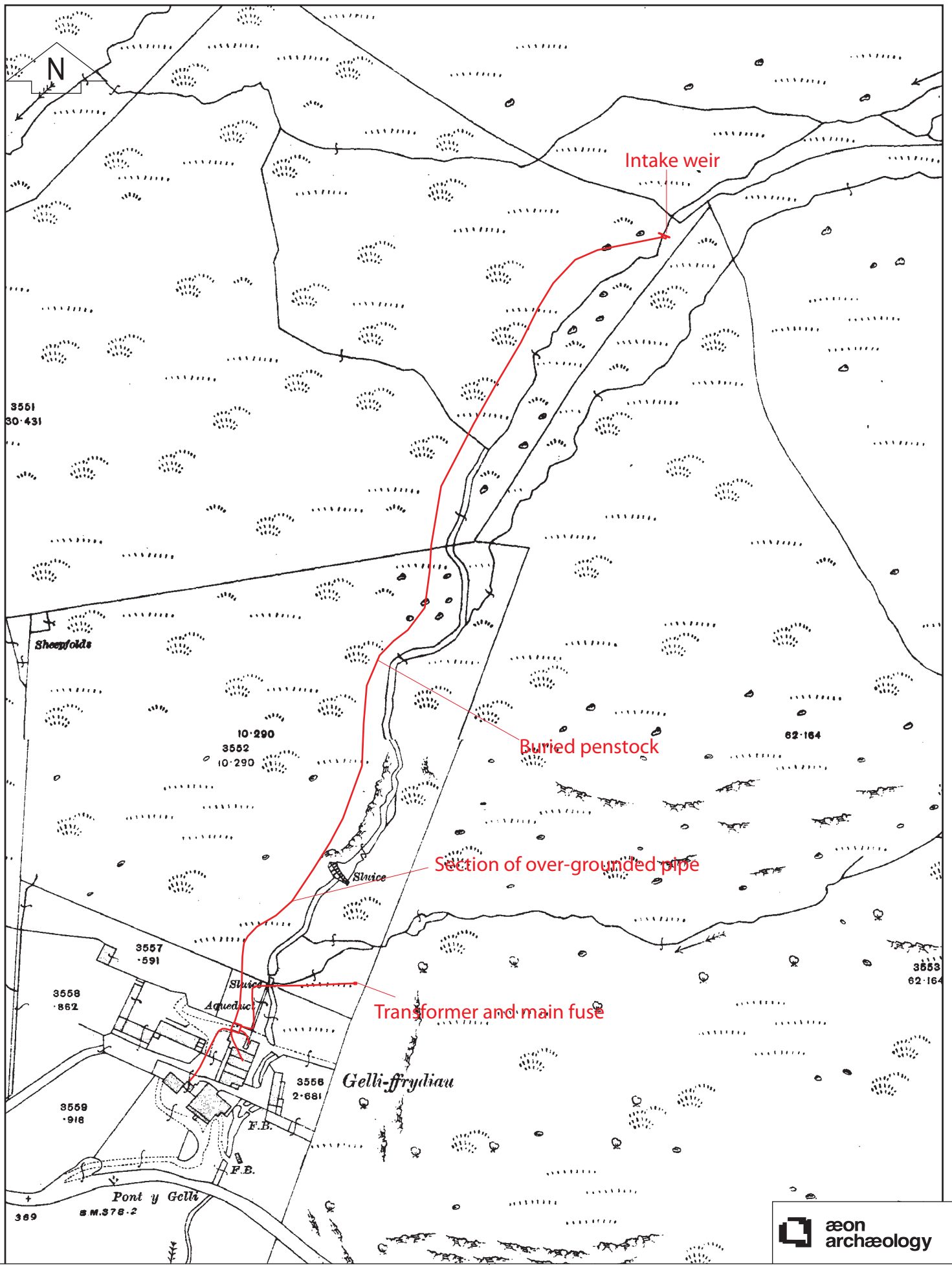


Figure 9: Third Edition Ordnance Survey map of 1915 (pipeline route shaded in red). Scale 1:2,500 at A4.



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Figure 10: Location of Historic Landscape Character Areas (HLCAs). (Hydro route shaded in blue). Scale 1:10,500 at A4.

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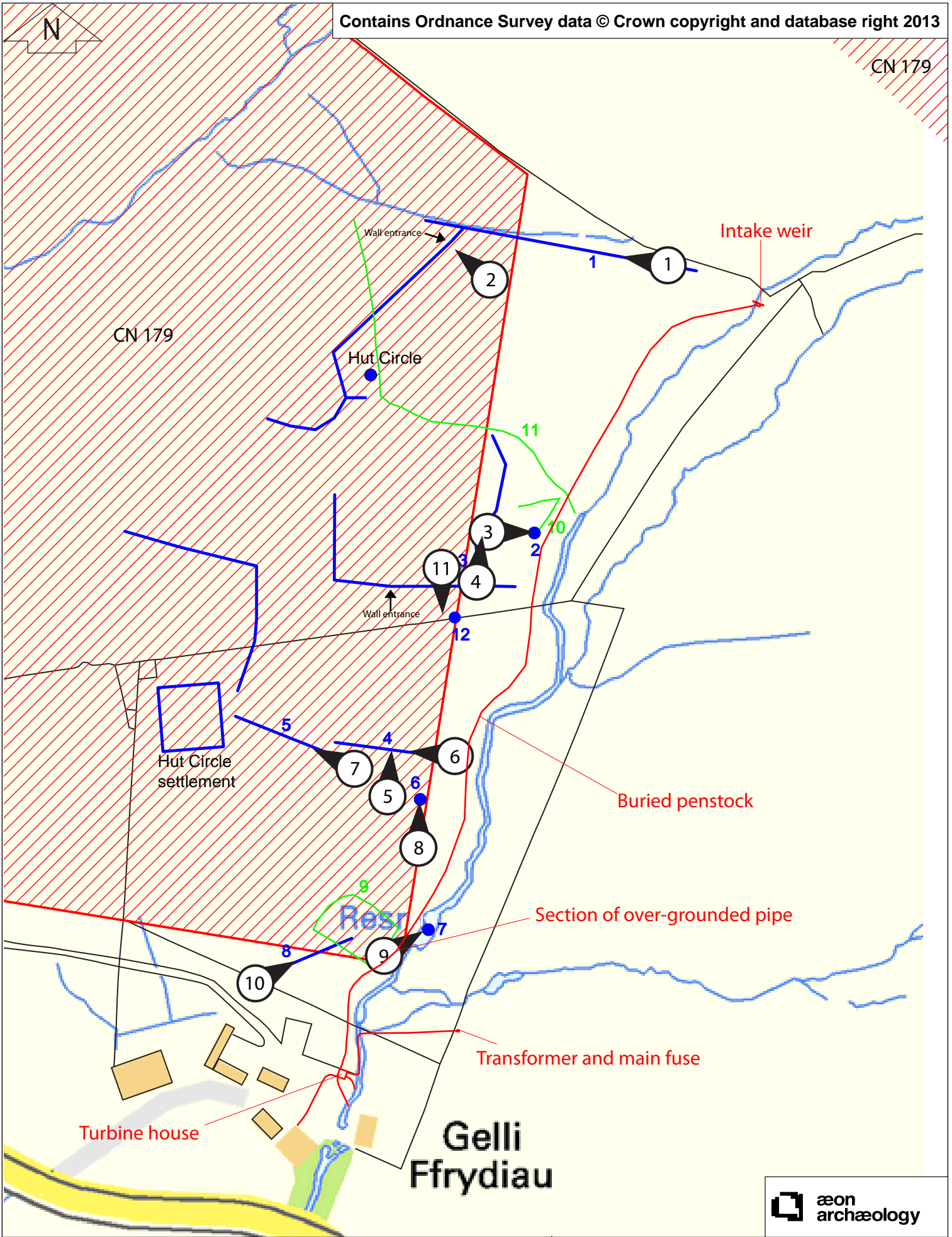


Figure 11: Location of photographs (numbered circles). Scale 1:2,500 at A4. (Sites identified during the field walkover shown in blue; sites identified from aerial photographs shown in green; penstock route shown in red; SAM polygons outlined pink).



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Plate 01: Relict field boundary enclosure (feature 1) from the east. Scale 1.0m.



Plate 02: Relict field boundary enclosure (feature 1) showing opening, from the southeast. Scale 1.0m



Plate 03: Possible hut circle (feature 2) from the west. Scale 1.0m.



Plate 04: Relict field boundary enclosure SAM (feature 3), from the south. Scale 1.0m



Plate 05: Relict revetment wall and trackway (feature 4) from the south. Scale 1.0m.



Plate 06: Relict revetment wall and trackway (feature 4), from the east. Scale 1.0m



Plate 07: Relict field boundary wall SAM (feature 5) from the southeast. Scale 1.0m.



Plate 08: Quarry scoop (feature 6), from the south. Scale 1.0m



Plate 09: Weir (feature 7) from the southwest.



Plate 10: Former field boundary wall (feature 8), from the southwest. Scale 1.0m



Plate 11: Field wall (feature 12) from the north. Scale 1.0m.

