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**Ty Coch Hydro Scheme, Nantlle,
Gwynedd.
March 2014**

Archaeological Desk-Based Assessment
Project Code: A0034.1
Report no. 0034



æon archaeology

Ty Coch Hydro Scheme, Nantlle, Gwynedd. March 2014

Report no. 0034 v1.0

Archaeological Desk-Based Assessment

Aeon Archaeology

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Project Code: A0034.1

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1.0 Non Technical Summary

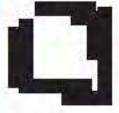
1.0 NON-TECHNICAL SUMMARY

Aeon Archaeology was commissioned by Greenerth Hydro Ltd to undertake an archaeological desk-based assessment of a proposed new hydro-electric scheme with turbine house, buried penstock (pipeline), and electrical cable connection. The proposed scheme intake is to be located on the eastern bank of the Afon Ty Coch, an outfall stream of Llynau Cwm Silyn and a tributary of the Afon Llyfni, approximately 1.4km southwest of the village of Nantlle, Gwynedd and within the Snowdonia National Park Authority (SNPA).

The archaeological desk-based assessment identified twenty archaeological sites within the 40.0m wide assessment corridor centred on the pipe route. Of these it is expected that the proposed scheme will have a low adverse direct physical impact upon two cloddiau and a trackway considered to be of local importance; a revetment wall of unknown importance but suspected to be of prehistoric date and national importance; and a ditch of unknown age. Site specific recommendations have been made for a watching brief to be maintained while the revetment wall and ditch features are breached and for any revealed archaeological remains to be recorded.

In addition the report identified a boulder field, stony spread, and three flat terraces which are considered to have an increased potential for preserved buried archaeological remains and recommendations have been made for a watching brief to be maintained during the excavation of the penstock trench in these areas.

The report also identified two possible medieval long-huts, a possible prehistoric hut-circle, and a section of walling that lie within the assessment corridor but away from the proposed penstock route. These features will not be directly impacted upon but there is a possibility that associated buried remains continue into the development area. As such recommendations have been made for a watching brief in proximity to these sites.



2.0 Introduction, Aims and Project Design

2.0 INTRODUCTION, AIMS AND PROJECT DESIGN

Aeon Archaeology was asked by Greenerth Hydro Ltd to carry out an archaeological desk-based assessment and field visit of a proposed hydro-electric scheme with turbine house, buried penstock (pipeline), and electrical cable connection. The proposed scheme intake is to be located on the eastern bank of the Afon Ty Coch, an outfall stream of Llynnau Cwm Silyn and a tributary of the Afon Llyfni, approximately 1.4km southwest of the village of Nantlle, Gwynedd and within the Snowdonia National Park Authority (SNPA).

The proposed scheme will consist of an intake weir located at **NGR SH 50850 51890** and a c.890.0m long buried penstock initially running southwest to northeast before turning and heading northwest to a new turbine house located at **NGR SH 50660 52540**. The hydro scheme will then empty back into the Afon Ty Coch via a 4.0m long buried outfall pipe running west from the turbine. In addition a buried new power cable will run northeast from the turbine house for approximately 0.4km to a new meter and 200kVA transformer.

A mitigation brief was not prepared for this scheme by the SNPA Archaeologist, but full planning permission has been granted with the following archaeological condition:

Prior to any work commencing (including any ground disturbance works or ground clearance) pursuant to this permission the applicant/developer shall submit to and receive written approval from the Local Planning Authority for an archaeological specification for a programme of works which must meet all relevant archaeological standards. The development shall subsequently be carried out in strict accordance with the approved programme of works unless otherwise agreed to in writing by the Local Planning Authority (condition 5, planning application NP3/22/88).

The reason for this condition is:

To ensure the implementation of an appropriate programme of archaeological mitigation in accordance with the requirements of Planning Policy Wales 2010 and Welsh Office Circular 60/96 Planning and the Historic Environment: Archaeology.

This archaeological desk-based assessment is for the proposed development area, which includes the water intake point, the penstock, the turbine house, the water outflow, the new power supply, and a 40.0m wide assessment corridor centred on the proposed pipeline route.

As part of the archaeological desk-based assessment a 1.0km search area centred on the proposed 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 Gwynedd Archives and Record Office. Information on Scheduled Ancient Monuments and Listed Buildings was obtained from Cadw.

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 significance of any remains in their context both regionally and nationally;
- (iii) The potential impact of the proposed development on known sites of archaeological importance including their setting.

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

- (i) Archival research
- (ii) Field visit/site walkover of all accessible areas
- (iii) Written report
- (iv) Project archive

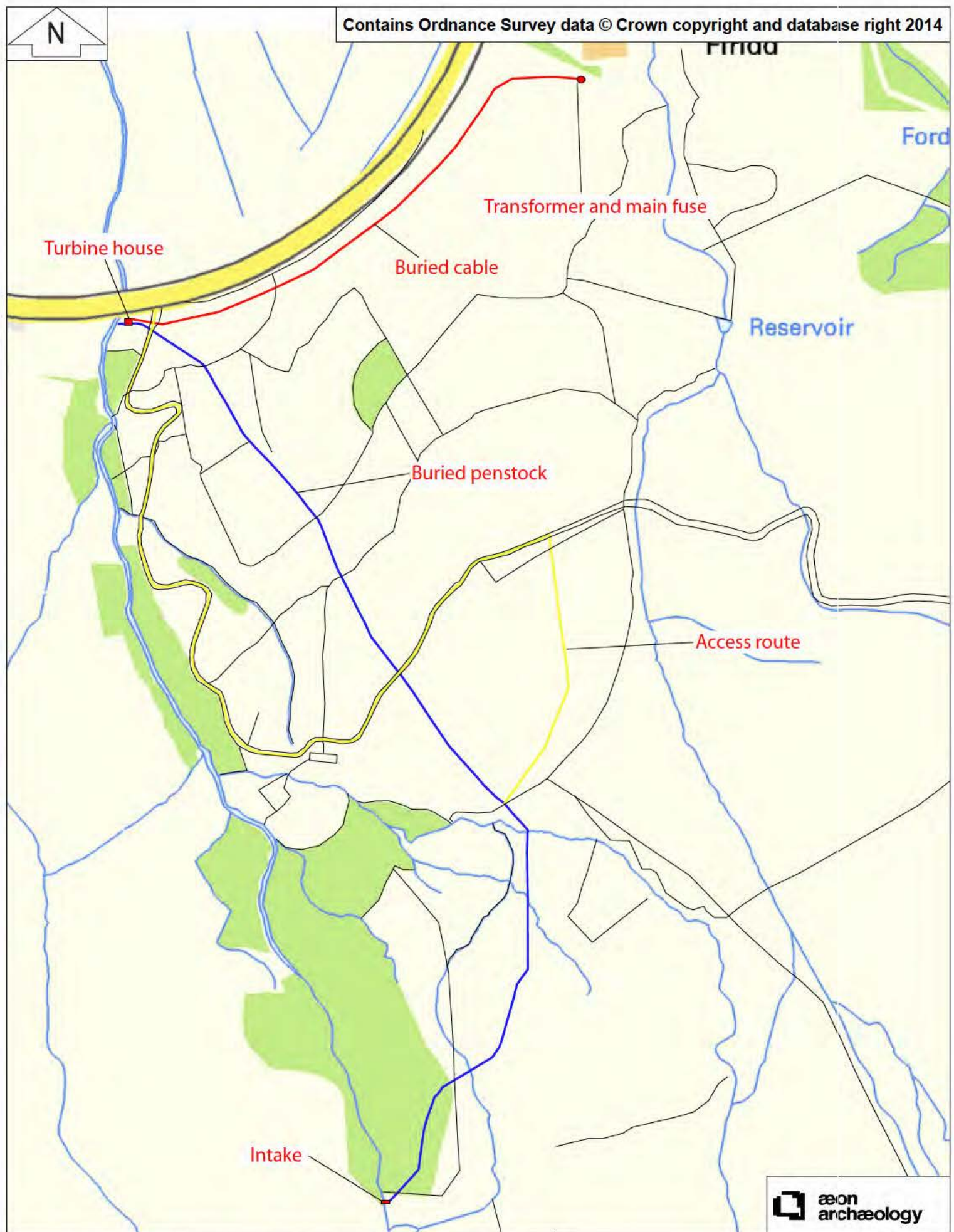


Figure 01: Location of proposed hydro scheme.
Scale 1:3,500 at A4.

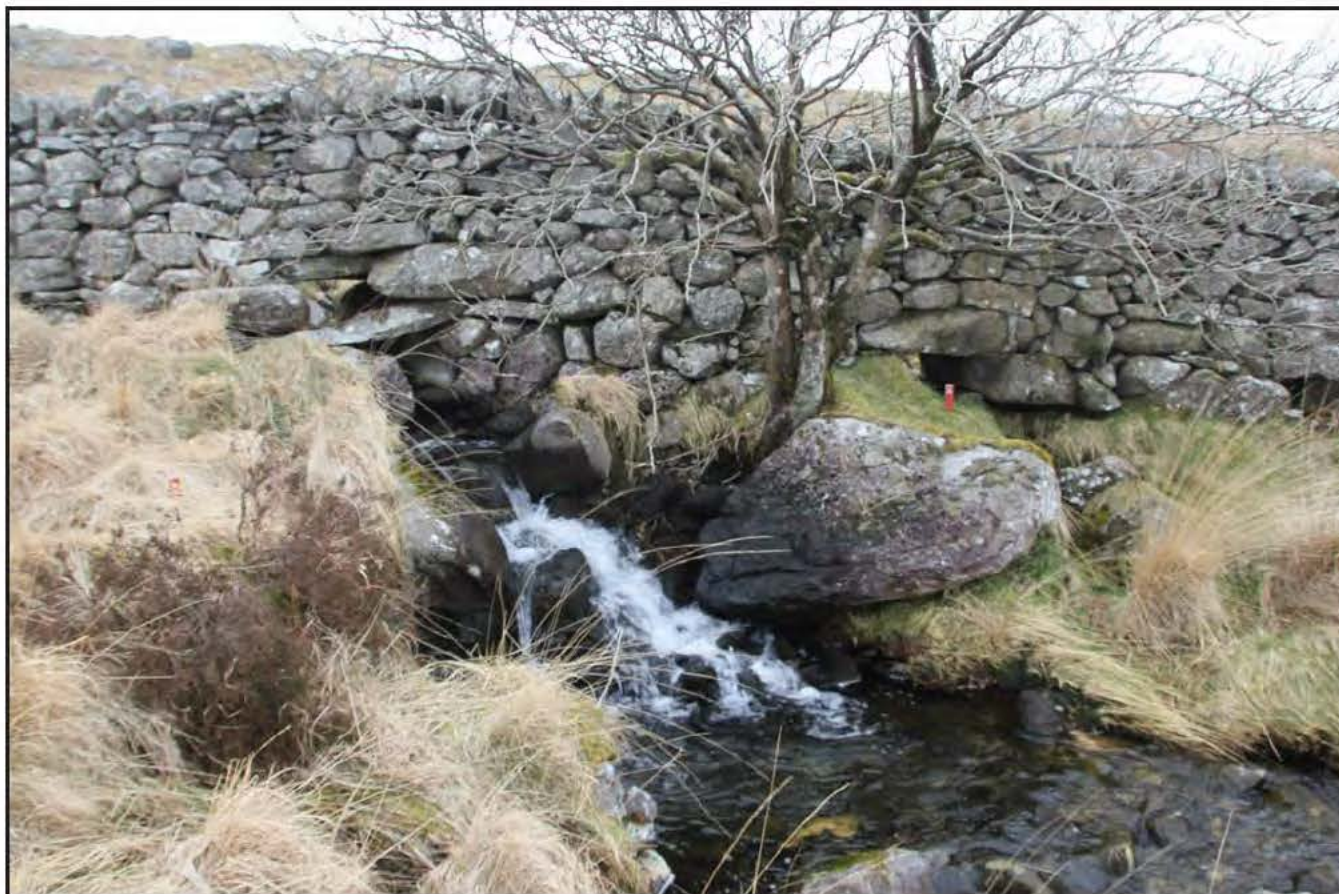


Plate 01: View of proposed hydro intake weir, from the northeast.



Plate 02: View of proposed hydro penstock route, from the south.



Plate 03: View of proposed turbine house location, from the southeast. Scale 1.0m.



3.0 Methods and Techniques

3.0 METHODS AND TECHNIQUES

3.1 Archival research

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

- 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, and the National Archaeological Record index cards and aerial photography.
- The National Monuments Record (NMR RCAHMW, National Monuments Record of Wales, Plas Crug, Aberystwyth, SY23 1NJ) was checked for sites additional to the HER.
- Information about Listed Buildings and Scheduled Ancient Monuments from Cadw were examined in the regional HER. The Register of Outstanding and Special Historic Landscapes and the Register of Parks and Gardens was checked, and also the location of World Heritage Sites.
- Secondary sources were examined, including the Inventories of the Royal Commission on Ancient and Historical Monuments for Wales, and works held within the regional libraries.
- Evidence from aerial photographs was collated. Vertical and oblique collections held by the NMR, CCW and Welsh Government were examined.
- Results from previous archaeological work within the area was also reviewed.

3.2 Site walkover

The site walkover was carried out on 19th March 2014 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. All archaeological sites and view points were photographed using a digital SLR (Canon 550D) set to maximum resolution (72 dpi).

3.3 Desk-based assessment report

All features identified from the archival research and site walkover were assessed and allocated to categories of international, national, regional/county, local and none/unknown importance as listed in section 6.0. These are intended to place the archaeological feature within a geographical context of importance and thus help inform the most suitable level of mitigatory response. 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) and Welsh Office Circular 60/96.

3.4 Project archive

A full archive including plans, photographs and written material was prepared. All plans, photographs and written descriptions were labelled and cross-referenced using Aeon

Archaeology pro-formas. A draft copy of the report was sent to the client and upon written approval from them copies of the report will be sent to the regional HER (Gwynedd Archaeological Trust, Craig Beuno, Garth Road, Bangor, LL57 2RT), the Snowdonia National Park Authority (SNPA) Archaeologist, and the Royal Commission on the Ancient and Historic Monuments in Wales (RCAHMW). All notes, plans, and photographs arising from the desk-based assessment are stored at Aeon Archaeology under the project code **A0034.1**.



4.0 Archaeological and Topographical Background

4.0 ARCHAEOLOGICAL AND TOPOGRAPHICAL BACKGROUND

4.1 Topographic Description

The proposed hydro-electric scheme intake is located on the eastern bank of the Afon Ty Coch, approximately 1.4km southwest of the village of Nantlle, Gwynedd and within the Snowdonia National Park Authority (SNPA). The proposed scheme will consist of an intake weir located at NGR SH 50850 51890 and a c.890.0m long buried penstock (pipe) initially running southwest to northeast before turning and heading northwest to a new turbine house located at NGR SH 50660 52540. The hydro scheme will then empty back into the Afon Ty Coch via a 4.0m long buried outfall pipe running west from the turbine. In addition a buried new power cable will run northeast from the turbine house for approximately 0.4km to a new meter and 200kVA transformer.

The site lies within the parish of Llanllyfni Community, within the historic county of Caernarfonshire and unitary authority of Gwynedd. Mostly given over to rough pasture, the farmland is dominated by acid grassland within which there are cushions of gorse. On the lower slopes there is improved and semi-improved grassland. The site is mostly enclosed by dry-stone walls although wooden post and wire fence has also been utilised in places. The land is primarily given over to hill sheep farming, although some cattle farming also takes place within the localised landscape, generally on the lower slopes.

The assessment area slopes from approximately 262m OD at the proposed hydro intake with the proposed turbine house lying at approximately 116m OD.

The bedrock geology is of the Nant Ffrancon subgroup, a siltstone sedimentary bedrock that formed approximately 449 to 485 million years ago in the Ordovician Period within an environment previously dominated by shallow seas. The superficial deposits are of hummocky glacial deposits, Devensian – Diamicton till, and sand and gravel that formed up to 2 million years ago in the Quaternary Period when the local environment was dominated by Ice Age conditions (British Geological Survey).

4.2 Statutory and non-statutory designations

4.2.1 Non-designated monument points from the Gwynedd Historic Environment Record (figure 2)

The Gwynedd Historic Environment Record (HER) maintains a register of non-designated archaeological sites represented as single point data or as polygons. These are identified through their Primary Reference Number (PRN). These include sites which are of archaeological/historical interest, artefact find spots, documentary evidence, and locations of past events such as archaeological projects.

There are 30 non-designated monuments within 1.0km of the proposed pipeline route (see appendix I) but none lie within the 40.0m wide assessment corridor centred on the penstock route. In addition there are 18 new monument sites within 1.0km of the proposed scheme, these are monument points that have been identified during past fieldwork but are not fully recorded within the Gwynedd HER. The following new monument sites lie within the 40.0m wide assessment corridor centred on the proposed scheme:

- (i) The post-medieval farmstead *Fridd* (PRN: 22529)

The proposed scheme lies within 100.0m of the following:

- (i) Approximately 33.0m north of the post-medieval *Building SW of Ffridd farmstead* (PRN: 22534);
- (ii) Approximately 36.0m east of the medieval? *Field wall SW of Ffridd farmstead* (PRN: 22537);
- (iii) Approximately 45.0m east of the Nantlle Valley Lower Slopes - Landscape (PRN: 15736);
- (iv) Approximately 61.0m west of the medieval *Sheepfold and enclosure S of Ffridd farmstead* (PRN: 22546).

4.2.2 Scheduled Ancient Monuments (figure 2)

Scheduled monuments are those considered to be monuments of national importance. The Ancient Monuments and Archaeological Areas Act 1979 supports a formal system of Scheduled Monument Consent (SMC) for any work to a designated monument. Any works within a Scheduled area will require SMC; this includes non-invasive techniques such as geophysics or field-walking.

There are 3 Scheduled Ancient Monuments within 1.0km of the proposed pipeline route (see appendix I) but none are located within the 40.0m wide assessment corridor centred on the pipe route or within 500.0m.

4.2.3 Listed Buildings (figure 3)

The Secretary of State for Culture, Media and Sport holds a List of Buildings of Special Architectural or Historic Interest, considered to be of national importance. Compiled under the Planning (Listed Buildings and Conservation Areas) Act 1990, the List includes structures from boundary walls and telephone boxes to cathedrals. Listing gives statutory protection and restrictions apply. Consent may be required for works to, or that affect the setting of, a Listed Building and the Local Planning Authority conservation officer should be consulted if in doubt.

There are 14 Listed Buildings within 1.0km of the proposed pipeline route (see appendix I) but none lie within the 40.0m assessment zone centred on the pipe or within 500.0m.

4.2.4 National Monuments Record (figure 3)

The Royal Commission on the Ancient and Historic Monuments in Wales (RCAHMW) maintains the National Monuments Record (NMR) for Wales. This is a register of non-designated archaeological sites represented as single point data or as polygons. These are identified through their National Primary Reference Number (NPRN) and include sites which are of archaeological/historical interest, artefact find spots, documentary evidence, and locations of past events such as archaeological projects that are not statutorily protected.

There are 58 non-designated monument points within 1.0km of the pipeline route (see appendix I) but none lie within the 40.0m assessment zone centred on the pipe.

The pipe route lies within 100.0m of the following:

- (i) Approximately 55.0m west of the post-medieval *South of Fridd sheep fold III* (NPRN: 287248);
- (ii) Approximately 84.0m north of the prehistoric *South of Fridd hut circle* (NPRN: 287245);
- (iii) Approximately 91.0m northeast of the post-medieval *Ty Coch, ruins SSE of* (NPRN: 401179).

4.2.5 Historic Landscape Character Areas (HLCAs) (figure 4)

Cadw, National Resource Wales (formerly the Countryside Council for Wales), and the International Council of Monuments and Sites (ICOMOS UK) compiled the two volume Register of Landscapes of Historic Interest in Wales. This includes 58 landscapes of outstanding or special historic interest, which are considered to be the best examples of different types of historic landscapes in Wales. The Register provides information to decision makers and landscape managers, to help ensure that the historic character of the landscape is sustained, and that where change is contemplated, it is well-informed.

The proposed development site lies within the following Historic Landscape Area (HLA):

- (i) The *Dyffryn Nantlle Landscape of Outstanding Historic Interest* (HLW(Gw)9).

Historic Landscape Characterisation takes a closer look at the historic landscape by showing the processes that have shaped the landscape over centuries of human activity, contributing to its present character. Detailed characterisation studies have been compiled by the four Welsh Archaeological Trusts for all 58 areas on the Register. They are used by local government and developers to help assess the impact of development proposals on the historic landscape.

The proposed development area lies within the following Historic Landscape Character Areas (HLCAs):

- (i) The *Nantlle valley lower slopes* Historic Landscape Character area (HLCA: 37);
- (ii) The *Floor of Nantlle valley* Historic Landscape Character area (HLCA: 49).

4.2.6 Historic Parks and Gardens

Cadw holds a Register of Historic Parks and Gardens of Special Historic Interest. These Registered landscapes are graded I, II* or II, and include private gardens, public parks and other green spaces. They are valued for their design, diversity and historical importance. Inclusion on the Register brings no additional statutory controls, but there is a presumption in favour of conservation of the designated site. Local authorities are required to consult Cadw on applications affecting sites Registered as grade I or II* and the Garden History Society on sites of all grades.

There are no historic parks and gardens within the 40.0m wide assessment corridor centred on the pipe route or within 1.0km of the proposed development area.

4.2.7 Events

The location of the proposed pipeline route is included within the Historic Landscape Characterisation of Caernarfon-Nantlle (GAT report 402) carried out in 2001 but no specific sites were identified as part of the work. Furthermore, the localised landscape of the Nantlle valley has been covered within several reports including a desk-top study of the Ty Mawr West slate quarry in 2002 by Engineering Archaeological Services Ltd, an archaeological evaluation by the Gwynedd Archaeological Trust in 1992, and an assessment of the Nantlle slate quarrying complex by Govannon Consultancy in 2002. However, all of these study areas lay outside of the proposed pipeline route and no relevant information concerning the study area was gained.

A survey commissioned by the RCAHMS and undertaken by Oxford Archaeology North was undertaken in 2006 of the Nantlle Valley. This report covered the proposed hydro route location and identified a prehistoric hut circle (NPRN: 287245) approximately 84.0m to the south of the hydro intake point. Further features including suspected prehistoric ruined hut circles (NPRN: 287228 and 287229) were identified approximately 550.0m to the southeast.

A desk-based assessment of a micro hydro-electric scheme was undertaken at Gelli Ffrydiau to the north of Llyn Nantlle Uchaf by Aeon Archaeology in 2013 (Aeon Archaeology report 0004). This report has been utilised to provide some background historical information for this proposed scheme.

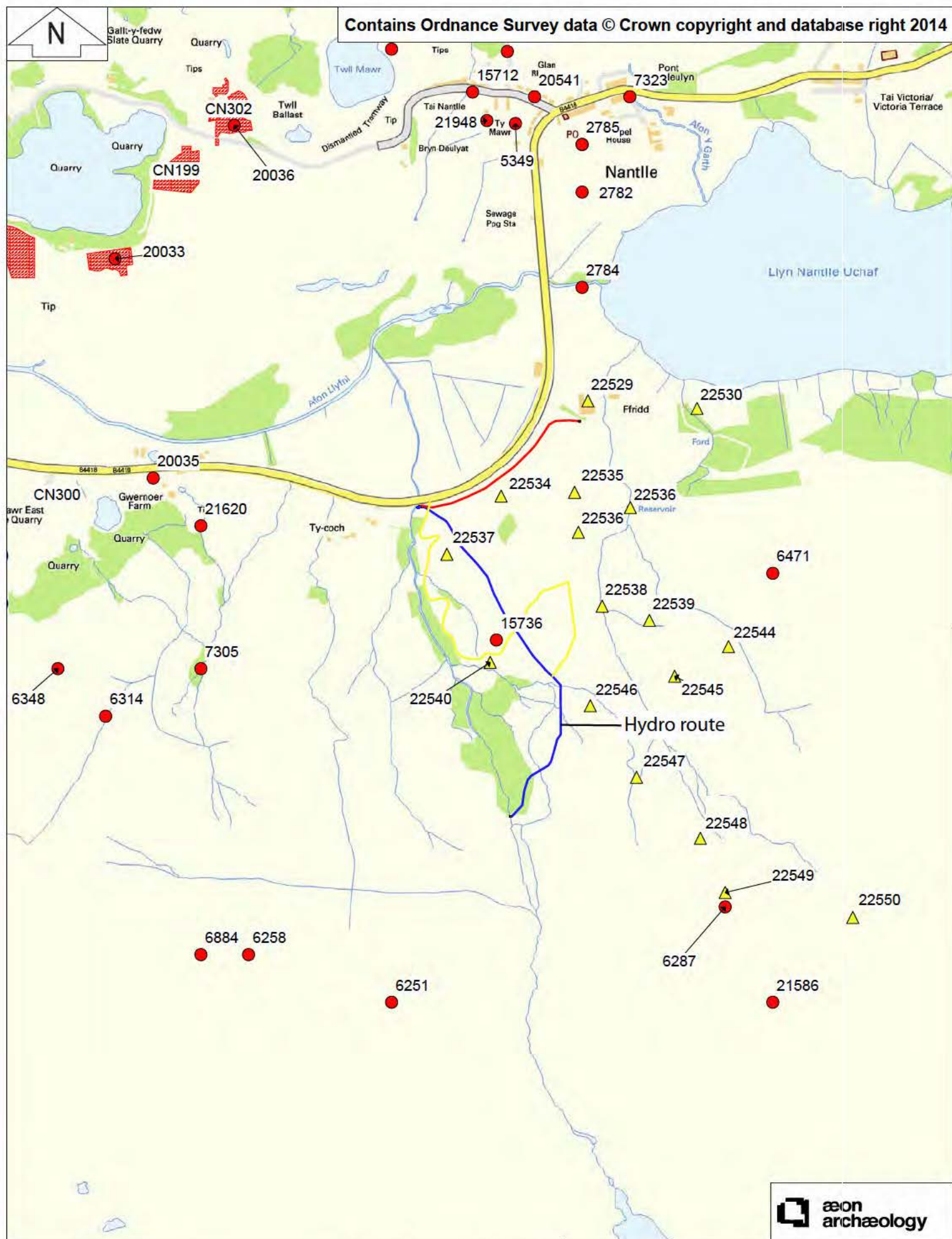


Figure 02: Location of monument points from the Gwynedd HER (red dots), new monument points (yellow triangles) and Scheduled Ancient Monuments (shaded red)(numbers refer to PRN and SAM number, see report appendix I). Scale 1:10,000 at A4.



Figure 03: Location of monument points from the National Monuments Record (blue triangles) and Listed Buildings (purple crosses) (numbers refer to NPRN and LB number, see report appendix I). Scale 1:10,000 at A4.

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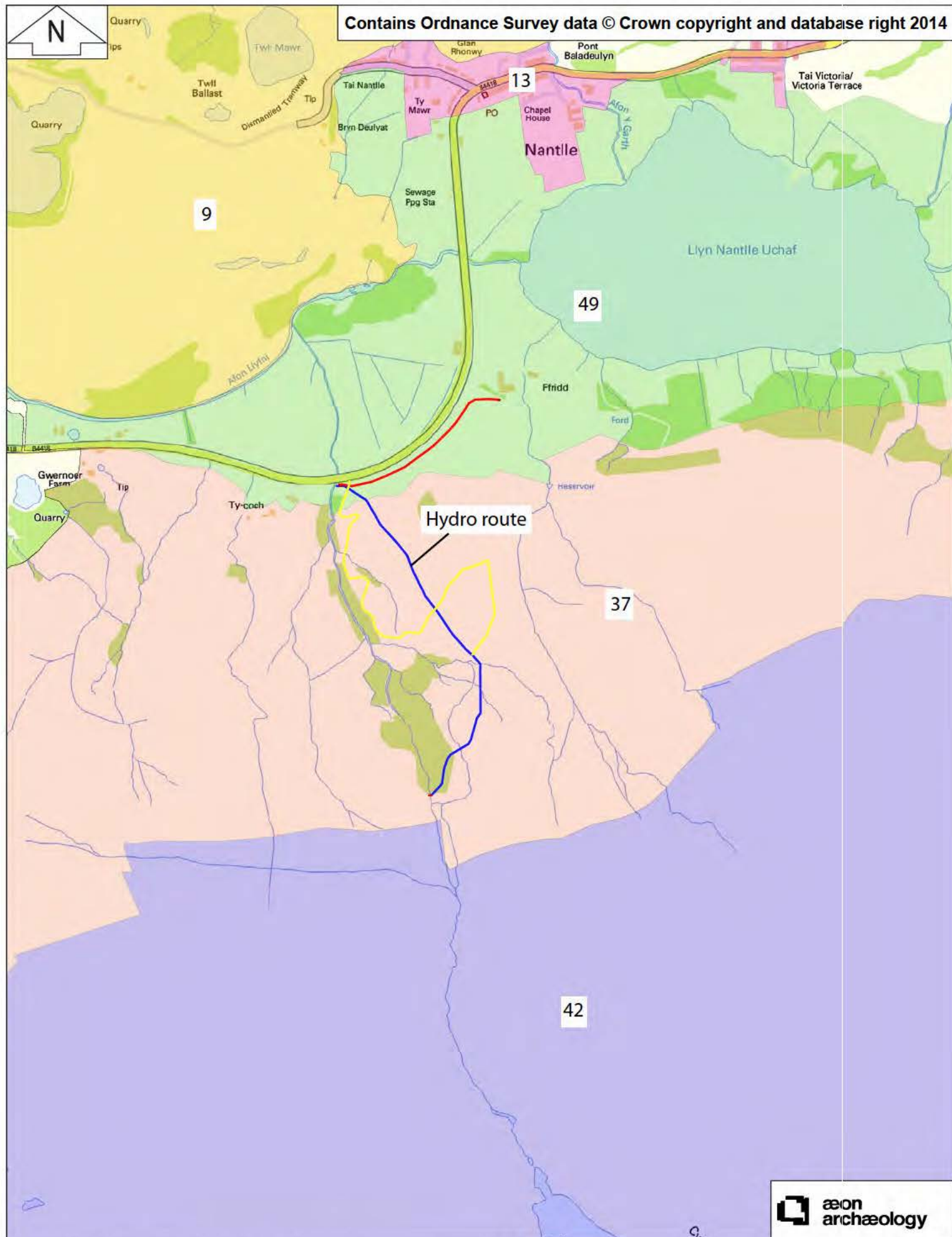


Figure 04: Location of Historic Landscape Character Areas (HLCAs) (numbers refer to HLCA number, see report appendix I).
Scale 1:10,000 at A4.



5.0 The Historical Context

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 Primary Reference Number (PRN) which is the number by which they are identified in the Gwynedd Historic Environment Record (HER), or by their Scheduled Ancient Monument reference, Listed Building reference and/or their National Primary Reference Number (NPRN) 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.

The beginning and end of certain periods is a contentious issue. In the Gwynedd Historic Environment Record (HER) the following dates are used. This is a standard convention across all of the Welsh HERs.

Table 1. Historic periods

Palaeolithic (prehistoric)	500,000 BC – 10,001 BC
Mesolithic (prehistoric)	10,000 BC – 4,001 BC
Neolithic (prehistoric)	4,000 BC – 2,351 BC
Bronze Age (prehistoric)	2,350 BC – 801 BC
Iron Age (prehistoric)	800 BC – 47 AD
Romano-British	48 AD – 409 AD
Post-Roman (Early Medieval)	410 AD – 1065 AD
Medieval	1066 AD – 1539 AD
Post-Medieval	1540 AD – 1900 AD
Modern	1901 AD – 2050 AD

5.1 Prehistoric and Roman Period

The site is located within the Dyffryn Nantlle Registered Landscape of Outstanding Historic Interest (HLW (Gw) 9), designated primarily for the range and quality of its extensive relict archaeological remains, mainly dating from the prehistoric, Romano-British, and medieval periods. In addition, there are extensive post-medieval slate quarries and associated spoil tips.

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 2.3km 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 Nantlle valley.

Physical evidence becomes more frequent in the Iron Age and Romano-British periods. Approximately 84.0m to the south of the hydro intake is a prehistoric hut circle measuring 5.0m in diameter, with an entrance on the east-north-east side. The hut circle is built on a slight platform and the dry-stone walls comprise of large unworked stones that have been built into irregular double-thickness courses that measure 1.0m in width and 0.50m in height (Coflein).

Further physical evidence of the prehistoric period has been identified higher up on the upland slopes and approximately 550.0m southeast of the hydro intake, where a hut circle settlement (NPRN: 287228) was identified by Oxford Archaeology North in 2006. The site consists of a

hut circle measuring 8.0m in diameter and situated upon a raised, levelled platform on the edge of a natural plateau on the north facing slope of the Nantlle Valley. The hut circle has an entrance that is aligned due east of the centre of the circle. The dry-stone walls comprise of large unworked stones and large earthfast stones that have been built into irregular courses that measure 1.30m wide by 0.60m high. The shallow plateau below the hut has been subject to significant stone clearance and there is a wall that delineates an enclosure around its edge. The enclosure consists of double thickness dry-stone wall that comprise of medium to large unworked stones that have been built into irregular courses and measure 1.0m in width by 0.50m in height.

Approximately 570.0m to the southwest of the proposed hydro intake is a group of ten sub-rectangular stony mounds (NPRN: 287258) that cover an area of flat cleared ground on the stony hillside. These have been interpreted as possible prehistoric stone cairns, although alternative identification has been provided as medieval hut platforms. In addition, and approximately 750.0m southwest of the hydro intake, is a prehistoric field-system and settlement that is overlain by a modern west-east enclosure wall (NPRN: 287260, 287261, 287266). In the area to the north of the wall lies the corner of the field-system and a smaller sub-rectangular stock enclosure that measure 32.0m in length by 25.0m in width. The dry-stone walls and banks consist of medium sized unworked stones that have been built into irregular courses and measure 1.5m in width and 0.40m in height. In the area to the south of the wall lies two-thirds of the field system consisting of separate northwest to southeast orientated sub-rectangular fields. There is a putative funerary cairn (NPRN: 287275) and a series of three rectangular house platforms (NPRN: 287274) that lie within one of the field plots (Oxford Archaeology North, 2006).

Numerous hut circle sites are found clinging to the northern and southern upland valley 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 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 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, Medieval and Post-Medieval Periods

The Early Medieval period is poorly represented within this part of northwest Wales and there are no known sites within 1.0km of the proposed pipeline. 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. The *llys* and royal lands became the

property of the English King upon the conclusion of the conquest of Wales (Aeon Archaeology report 0004).

Approximately 770.0m to the southwest of the proposed hydro intake is a group of three medieval sub-rectangular house platforms (NPRN: 287274). They consist of grass-covered and stone wall retained platforms set within a field plot within a prehistoric field-system (NPRN: 287260). They each measure up to 7.0m in length by 2.5m in width and one has a small annexe that measures 5.0m long by 2.0m wide. Several similarly shaped mounds that may be clearance cairns lie to the east (NPRN: 287258). A second sub-rectangular structure believed to be a medieval long-hut (NPRN: 287272) lies further to the southwest and approximately 970.0m from the proposed hydro intake. This structure measures 6.0m in length by 3.0m in width and survives to foundation level.

Two further medieval long-huts (NPRN: 287280 and 287281) are recorded on the National Monument Record as lying approximately 620.0m and 980.0m to the east of the penstock route respectively. In addition, the Gwynedd Historic Environment Record records two long-huts (PRN: 6348) located to the south of Dyffryn Nantlle and approximately 990.0m west of the penstock route.

The proposed route of the hydro-electric scheme is depicted in detail on the first, second and third edition 25" county series Ordnance Survey maps of 1889, 1900 and 1916 respectively (figures 5, 6, and 7). All three maps depict the area much as it exists today, with the exception that the B4418 road had not been constructed by this point in time. The farms of Fridd and Ty Coch are shown on all three maps, and the existing field boundaries are all shown. The only feature of note that is depicted is a structure, possibly a sheepfold or small cottage, towards the centre of the proposed penstock route and in close proximity to it. This structure is no longer visible and must have been demolished sometime after the production of the third edition map in 1916.

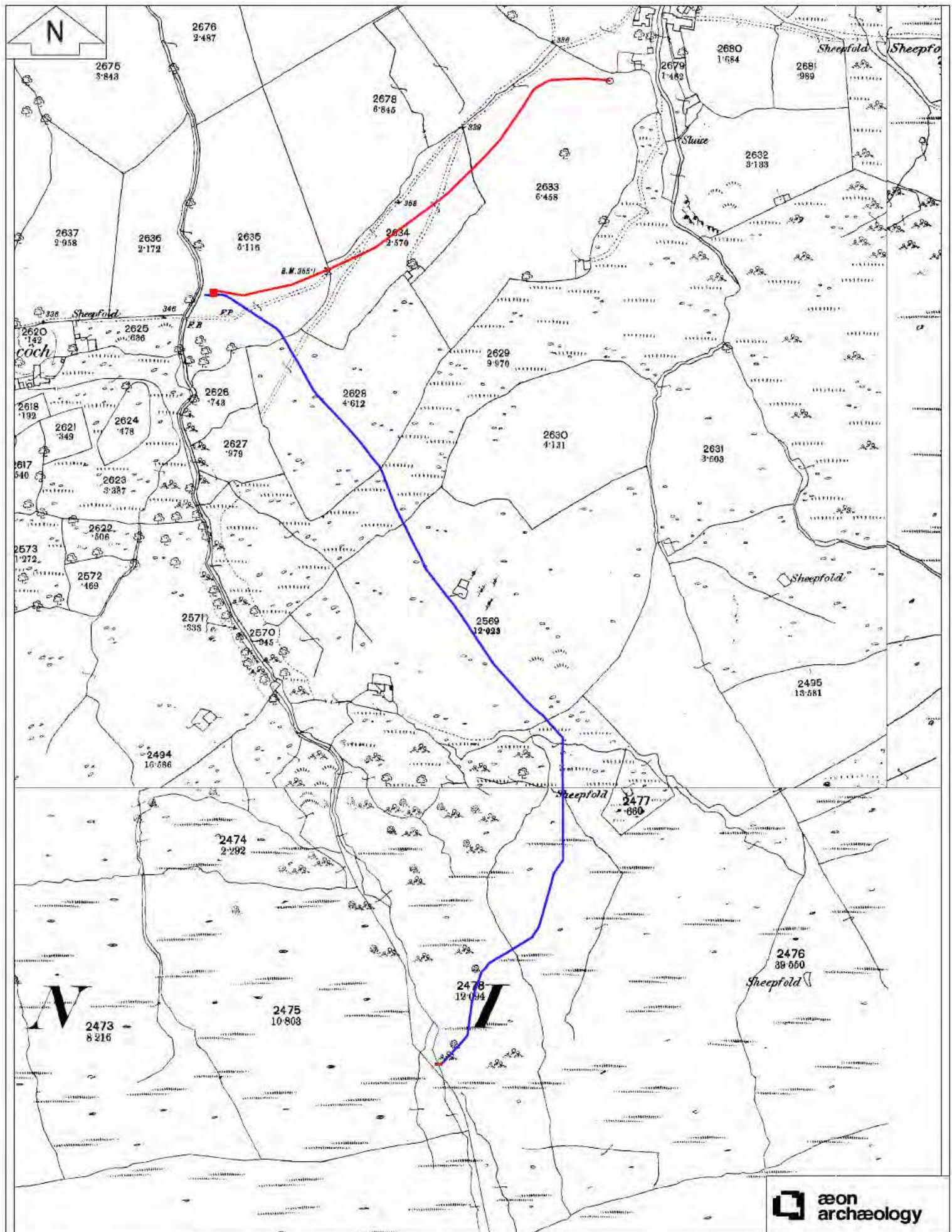


Figure 05: First edition 25" County Series Ordnance Survey map of 1889.

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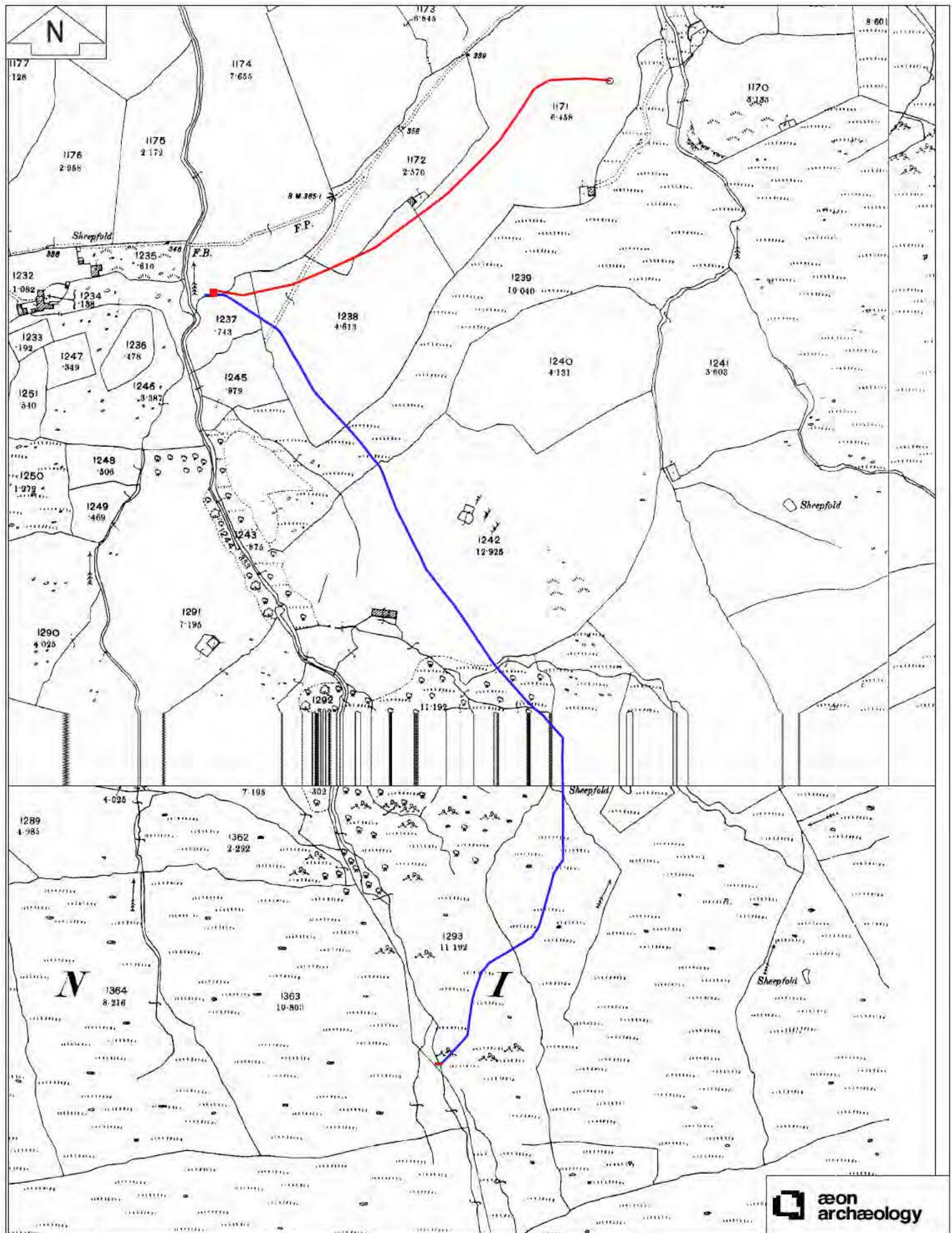
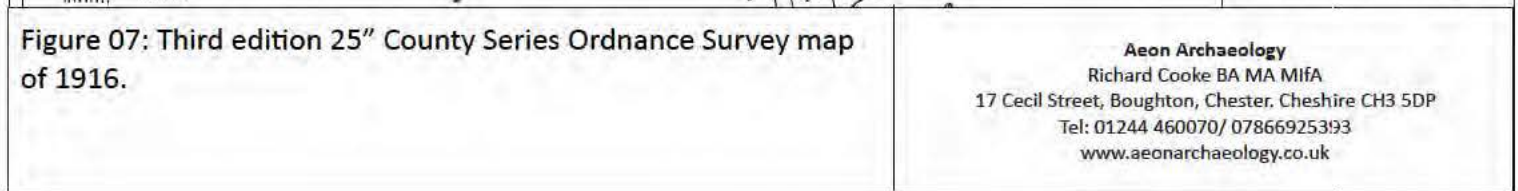


Figure 06: Second edition 25" County Series Ordnance Survey map of 1900.

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6.0 Assessment of Historical Assets

6.0 ASSESSMENT OF HISTORICAL ASSETS

6.1 Definitions

Definitions of importance, impact, and significance of effect as used in the gazetteer (section 6.2) are listed below. Definitions of assessment and mitigation techniques as used in the gazetteer are listed in appendix II.

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'.
Negligible/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.
Unknown	Archaeological sites whose importance cannot be determined with the information currently at hand. This can include sites where the extent of buried remains is unknown.

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 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.	Minor change to the setting of an archaeological monument or historic 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. The significance of effect

The significance of effect is derived from the importance of the resource and the magnitude of the impact upon it.

Very large - A serious impact on a site of international or national importance with little or no scope for mitigation. These effects represent key factors in the decision making process.

Large - Lesser impacts on sites of national importance and serious impacts on sites of regional importance, with some scope for mitigation. These factors should be seen as being very important considerations in the decision making process.

Moderate - Moderate or minor impacts on sites of regional importance and minor to major impacts on sites of local or minor importance. A range of mitigatory measures should be available.

Slight - Negligible impacts on sites of regional, local or minor importance and minor and moderate impacts on minor or damaged sites. A range of basic mitigatory measures should be available.

Neutral - No perceptible effect or change to sites of all categories.

The significance of effect will be determined using the table below, a basic matrix combining archaeological value and magnitude of impact.

Determination of Significance of Effect

Archaeological Value	International	Neutral	Moderate or Large	Large or Very Large	Very Large
	National	Neutral	Moderate or Slight	Moderate or Large	Large or Very Large
	Regional	Neutral	Slight	Moderate	Moderate or Large
	Local	Neutral	Neutral or Slight	Slight	Moderate or Slight
	Negligible	Neutral	Neutral or Slight	Neutral or Slight	Slight
		None	Low	Medium	High
		Magnitude of impact			



7.0 Site Gazetteer

7.0 SITE GAZETTEER – PHYSICAL IMPACTS

The field walkover discovered 20 sites of archaeological and historic interest within the 40.0m wide assessment corridor, as listed below.

In accordance with Paragraph 128 of the National Planning Policy Framework and Welsh Office Circular 60/96 each heritage asset has been assigned a level 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 with the suspected importance level placed in brackets if possible. 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 (indirectly physically impacting upon a site). The significance of effect is determined from the importance level of the resource and the magnitude of the impact upon it. Where it is expected that a site will be impacted upon by the proposed works then mitigation/assessment recommendations are provided. All archaeological/historical sites identified are depicted on figure 8 and the location/orientation of photographs are shown on figure 9.

1. Revetment wall	PRN: 58558
Figure: 8 and 9	Plate: 4
NGR: SH 50649 52470 – SH 50766 52573	Period: Unknown (prehistoric/ Romano-British)
<p>Description</p> <p>A revetment wall measuring approximately 1.3m in height and 2.0m in width runs from southwest to northeast at this point. The wall is constructed from dry-stone bonded large sized sub-angular cobbles and boulders, and divides two fields. The wall is depicted on the first, second and third edition 25" Ordnance Survey maps of 1889, 1900 and 1916 respectively (figures 5, 6 and 7) although it is suspected that it is much older in date. The use of such large stones within a revetment is often indicative of prehistoric or Romano-British lynchets and given the high frequency of sites from those eras within the localised landscape of Dyffryn Nantlle, there is a high possibility that this revetment also dates to this period.</p> <p>The revetment wall will require breaching by the proposed scheme and as such it is recommended that a basic record of the wall be taken prior to the commencement of works. However, the description and photographs provided within this report should be seen as being commensurate with a basic record level. In addition it is recommended that a watching brief be maintained during the revetment breach and a basic record be taken of its profile.</p>	
Category of importance: Unknown (national)	
Level of impact: Low adverse direct physical	
Significance of effect: Unknown (moderate or slight adverse)	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Maintain watching brief during revetment breach, basic record of profile.	



Plate 04: Revetment wall (feature 1), from the north. Scale 1.0m.

2. Trackway	PRN: 58559
Figure: 8 and 9	Plate: 5
NGR: SH 50750 52521 – SH 50706 52451	Period: Post Medieval
<p>Description</p> <p>A trackway measuring approximately 2.0m in width runs from northeast to southwest connecting Ffridd farm with the upland slopes. The track does not appear to have any structural form and has been terraced into the steep hillside slope, with some stone clearance taking place (see feature 3). The trackway is depicted in detail on the first, second and third edition 25" Ordnance Survey maps of 1889, 1900 and 1916 respectively (figures 5, 6 and 7) and it is likely to be of post-medieval date, being contemporary with Fridd farm.</p> <p>The track will require breaching by the proposed scheme and as such it is recommended that a basic record of the feature be taken prior to the commencement of works. However, the description and photographs provided within this report should be seen as being commensurate with a basic record level, and as such no further assessment or mitigatory measures are proposed.</p>	
Category of importance: Local	
Level of impact: Low adverse direct physical	
Significance of effect: Neutral or slight adverse	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Basic record – completed as part of desk-based assessment report	



Plate 05: Trackway (feature 2), from the northeast. Scale 1.0m.

3. Stone cairn	PRN: 58560
Figure: 8 and 9	Plate: 6
NGR: SH 50713 52467	Period: Unknown (post-medieval)
<p>Description</p> <p>A stone cairn measuring approximately 4.0m in length, 2.0m in width and 0.5m in height is located at this point. It is orientated northeast to southwest and lies to the immediate south of trackway feature 2. The cairn is comprised of unbonded medium and large sized sub-rounded cobbles with no visible structure or kerbing, suggesting that it is a post-medieval field clearance cairn rather than a Bronze Age funerary cairn. Moreover, it is probable that the cairn represents a phase of stone clearance along the length of trackway feature 2.</p> <p>This feature will not be impacted upon by the proposed scheme and as such no further assessment or mitigatory measures are proposed.</p>	
Category of importance: Unknown (negligible)	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: None	



Plate 06: Stone cairn (feature 3), from the northwest. Scale 1.0m.

4. Revetment wall	PRN: 58561
Figure: 8 and 9	Plate: 7
NGR: SH 50749 52451 – SH 50713 52428	Period: Unknown (prehistoric/ Romano-British)
<p>Description</p> <p>A revetment wall measuring approximately 0.9m in height and 1.2m in width runs from southwest to northeast at this point. The wall is constructed from large sized sub-angular cobbles and boulders bonded by earth, and divides two fields. The wall is not depicted on the first, second and third edition 25" Ordnance Survey maps of 1889, 1900 and 1916 respectively (figures 5, 6 and 7) although this is likely to be because of its somewhat ephemeral nature rather than it not having been in existence. The use of such large stones within a revetment is often indicative of prehistoric or Romano-British lynchets and given the high frequency of sites from those eras within the localised landscape of Dyffryn Nantlle, there is a high possibility that this revetment also dates to this period.</p> <p>This feature will not be impacted upon by the proposed scheme and as such no further assessment or mitigatory measures are proposed.</p>	
Category of importance: Unknown (national)	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: None	



Plate 07: Revetment wall (feature 4), from the northwest. Scale 1.0m.

5. Relict field wall	PRN: 58562
Figure: 8 and 9	Plate: 8
NGR: SH 50765 52444 – SH 50749 52515	Period: Unknown (prehistoric/ Romano-British)
<p>Description</p> <p>A relict field wall measuring approximately 1.3m in height and 1.2m in width runs from south to north at this point. The wall is constructed from very large sized sub-rounded cobbles and boulders bonded by earth, and divides two fields. The wall is not depicted on the first, second and third edition 25" Ordnance Survey maps of 1889, 1900 and 1916 respectively (figures 5, 6 and 7) although this is likely to be because of its somewhat ephemeral nature rather than it not having been in existence. The use of such large stones within a field wall is often indicative of prehistoric or Romano-British relict field systems and given the high frequency of sites from those eras within the localised landscape of Dyffryn Nantlle, there is a high possibility that this wall also dates to this period.</p> <p>This feature will not be impacted upon by the proposed scheme and as such no further assessment or mitigatory measures are proposed.</p>	
Category of importance: Unknown (national)	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: None	



Plate 08: Relict field wall (feature 5), from the south. Scale 1.0m.

6. Clawdd wall	PRN: 58563
Figure: 8 and 9	Plate: 9
NGR: SH 50839 52455 – SH 50754 52361	Period: Post-medieval
<p>Description A clawdd field wall measuring approximately 0.8m in height and 0.7m in width runs from southwest to northeast at this point. The wall is constructed from medium and small sized sub-angular cobbles bonded by an earthen bank, and reinforced by a wooden post and wire fence. The wall is depicted on the first, second and third edition 25" Ordnance Survey maps of 1889, 1900 and 1916 respectively (figures 5, 6 and 7) and is likely to be of post-medieval date.</p> <p>The clawdd will require breaching by the proposed scheme and as such it is recommended that a basic record of the feature be taken prior to the commencement of works. However, the description and photographs provided within this report should be seen as being commensurate with a basic record level, and as such no further assessment or mitigatory measures are proposed.</p>	
Category of importance: Local	
Level of impact: Low adverse direct physical	
Significance of effect: Neutral or slight adverse	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Basic record – completed as part of desk-based assessment report	



Plate 09: Clawdd wall (feature 6), from the northwest. Scale 1.0m.

7. Bank and ditch	PRN: 58564
Figure: 8 and 9	Plate: 10
NGR: SH 50817 52356 – SH 50763 52346	Period: Unknown
<p>Description</p> <p>An earthen bank measuring approximately 0.5m in height and 2.4m in width runs from west to east with a ditch measuring 1.0m in depth and 1.5m in width running alongside it to the immediate south. The earthen bank has fairly frequent medium sized sub-angular stones embedded within it and it is probable that the bank was created through upcast material by the excavation of the ditch. This feature is not depicted on the first, second and third edition 25" Ordnance Survey maps of 1889, 1900 and 1916 respectively (figures 5, 6 and 7) and it is unclear whether this was because it did not exist at the time or was considered too ephemeral to depict. It is probable that the ditch was excavated and as such bank created to help drain what is otherwise a marshy field. It is however unclear when this feature was created.</p> <p>This feature will not be impacted upon by the proposed scheme and as such no further assessment or mitigatory measures are proposed.</p>	
Category of importance: Unknown	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: None	



Plate 10: Bank and ditch (feature 7), from the northeast. Scale 1.0m.

8. Field wall	PRN: 58565
Figure: 8 and 9	Plate: 11
NGR: SH 50856 52384 – SH 50769 52319	Period: Post-medieval
<p>Description A field wall measuring approximately 1.2m in height and 0.6m in width runs from southwest to northeast at this point. The wall is of single-skin construction from dry-stone medium and small sized sub-rounded cobbles with a probable stock-proof course and standing a maximum of five courses in height. The wall is depicted on the first, second and third edition 25" Ordnance Survey maps of 1889, 1900 and 1916 respectively (figures 5, 6 and 7) and is likely to be of post-medieval date.</p> <p>This feature will not be impacted upon by the proposed scheme as the penstock will pass through the existing gateway. As such no further assessment or mitigatory measures are proposed.</p>	
Category of importance: Local	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: None	



Plate 11: Field wall (feature 8), from the northwest. Scale 1.0m.

9. Clawdd wall	PRN: 58566
Figure: 8 and 9	Plate: 12
NGR: SH 50967 52200 – SH 50899 52175	Period: Post-medieval
<p>Description</p> <p>A clawdd field wall measuring approximately 0.3m in height and 0.5m in width runs from southwest to northeast at this point. The wall is constructed from medium and small sized sub-angular cobbles bonded by an earthen bank, and reinforced by a wooden post and wire fence. The wall is depicted on the first, second and third edition 25" Ordnance Survey maps of 1889, 1900 and 1916 respectively (figures 5, 6 and 7) and is likely to be of post-medieval date.</p> <p>The clawdd will require breaching by the proposed scheme and as such it is recommended that a basic record of the feature be taken prior to the commencement of works. However, the description and photographs provided within this report should be seen as being commensurate with a basic record level, and as such no further assessment or mitigatory measures are proposed.</p>	
Category of importance: Local	
Level of impact: Low adverse direct physical	
Significance of effect: Neutral or slight adverse	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Basic record – completed as part of desk-based assessment report	



Plate 12: Field boundary (feature 9), from the northwest. Scale 1.0m.

10. Field wall	PRN: 58567
Figure: 8 and 9	Plate: 13
NGR: SH 50929 52169 – SH 50896 52067	Period: Post-medieval
<p>Description A field wall measuring approximately 0.8m in height and 0.5m in width runs from north to south at this point. The wall is of single-skin construction from dry-stone medium sized sub-rounded cobbles and standing a maximum of three courses in height. The wall is depicted on the first, second and third edition 25" Ordnance Survey maps of 1889, 1900 and 1916 respectively (figures 5, 6 and 7) and is likely to be of post-medieval date.</p> <p>This feature will not be impacted upon by the proposed scheme as the penstock will pass through the existing gateway. As such no further assessment or mitigatory measures are proposed.</p>	
Category of importance: Local	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: None	



Plate 13: Field wall (feature 10), from the southeast. Scale 1.0m.

11. Possible long-hut	PRN: 58568
Figure: 8 and 9	Plate: 14
NGR: SH 50958 52139	Period: Unknown (medieval)
<p>Description</p> <p>An area of ruinous walls standing to a maximum of two courses high may represent a possible medieval long-hut. The wall remains appear to cover an area measuring approximately 5.0m in length by 3.0m in width orientated east to west. The wall remains are of dry-stone and seemingly double-skin construction utilising medium and occasionally large sized sub-angular stone cobbles standing to a maximum of 0.4m in height and 0.6m in width. The possible long-hut stands within an area of scattered stones (feature 16) that has been identified as an area of high potential for buried archaeological remains.</p> <p>The site is not depicted on the first, second and third edition 25" Ordnance Survey maps of 1889, 1900 and 1916 respectively (figures 5, 6 and 7) although it was almost certainly too ephemeral in nature to have been depicted. This feature will not be impacted upon by the proposed scheme as the penstock will pass approximately 4.0m to the west. However, associated buried remains of the possible long-hut may extend into the penstock route and as such it is recommended that a watching brief be maintained during groundworks in proximity to the site.</p>	
Category of importance: Unknown (national)	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Watching brief during groundworks in close proximity	



Plate 14: Possible long hut (feature 11), from the northeast. Scale 1.0m.

12. Possible hut-circle	PRN: 58569
Figure: 8 and 9	Plate: 15
NGR: SH 50970 52070	Period: Unknown (prehistoric/ Romano-British)
<p>Description</p> <p>A rough circular arrangement of stones overgrown with reeds may represent a prehistoric or Romano-British round-hut at this location. The stones appear to cover an area measuring approximately 3.0m internal diameter, with the walls standing only one course high and consisting of large sized sub-angular stones to a height of approximately 0.4m. The site is not depicted on the first, second and third edition 25" Ordnance Survey maps of 1889, 1900 and 1916 respectively (figures 5, 6 and 7) although it was almost certainly too ephemeral in nature to have been depicted.</p> <p>This feature will not be impacted upon by the proposed scheme as the penstock will pass approximately 15.0m to the west. However, associated buried remains of the possible hut-circle may extend into the penstock route and as such it is recommended that a watching brief be maintained during groundworks in proximity to the site.</p>	
Category of importance: Unknown (national)	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Watching brief during groundworks in close proximity	



Plate 15: Possible round hut (feature 12), from the southeast. Scale 1.0m.

13. Possible long-hut	PRN: 58570
Figure: 8 and 9	Plate: 16
NGR: SH 50927 52015	Period: Unknown (medieval)
<p>Description</p> <p>An area of ruinous walls standing to a maximum of two courses high may represent a possible medieval long-hut at this location. The wall remains appear to cover an area measuring approximately 3.0m in length by 1.5m in width orientated east to west. The wall remains are of dry-stone and seemingly double-skin construction utilising medium and occasionally large sized sub-angular stone cobbles standing to a maximum of 0.4m in height and 0.4m in width..</p> <p>The site is not depicted on the first, second and third edition 25" Ordnance Survey maps of 1889, 1900 and 1916 respectively (figures 5, 6 and 7) although it was almost certainly too ephemeral in nature to have been depicted. This feature will not be impacted upon by the proposed scheme as the penstock will pass approximately 10.0m to the east. However, associated buried remains of the possible long-hut may extend into the penstock route and as such it is recommended that a watching brief be maintained during groundworks in proximity to the site.</p>	
Category of importance: Unknown (national)	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Watching brief during groundworks in close proximity	



Plate 16: Possible long hut (feature 13), from the southwest. Scale 1.0m.

14. Boulder field	PRN: 58571
Figure: 8 and 9	Plate: 17
NGR: SH 50867 51933	Period: Unknown
<p>Description</p> <p>An area of boulders lie concentrated within an area measuring approximately 120.0m by 60.0m orientated north to south and lying to the immediate east of the Afon Ty Coch. The boulder field is undoubtedly of natural origin, most likely being created by the deposition of glacial boulders upon retreat of the Ice Age glaciers which were then deposited along the sides of the stream during periods of storm flooding. However, it is difficult to see how these stones were not used for either prehistoric, Romano-British or medieval building material due to their abundance and suitable size, as well as the concentration of archaeological sites within the Nantlle valley. Indeed, a prehistoric hut-circle (NPRN: 287245) has been identified towards the southern limit of the boulder field and the area is considered to be of high potential for buried archaeological remains of these time periods.</p> <p>No discernible walls or structures could be seen within the boulder field but it is recommended that a watching brief be maintained during groundworks in this area and that any archaeological remains encountered are recorded.</p>	
Category of importance: Unknown	
Level of impact: Low adverse direct physical	
Significance of effect: Unknown	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Watching brief during groundworks in this area	



Plate 17: Boulder field (feature 14), from the northwest.

15. Section of wall	PRN: 58572
Figure: 8 and 9	Plate: 18
NGR: SH 50942 51995	Period: Unknown
<p>Description</p> <p>A small section of ruinous wall standing to a maximum of two courses high may represent a structure such as a medieval long-hut at this location. The wall remains are sparse and appear to cover an area measuring approximately 1.0m in length by 0.5m in width but quite clearly turn at a right-angle. The wall remains are of dry-stone construction utilising medium sized sub-angular stone cobbles overgrown with grass.</p> <p>The site is not depicted on the first, second and third edition 25" Ordnance Survey maps of 1889, 1900 and 1916 respectively (figures 5, 6 and 7) although it was almost certainly too ephemeral in nature to have been depicted. This feature will not be impacted upon by the proposed scheme as the penstock will pass approximately 12.0m to the west. However, associated buried remains of the structure may extend into the penstock route and as such it is recommended that a watching brief be maintained during groundworks in proximity to the site.</p>	
Category of importance: Unknown	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Watching brief during groundworks in close proximity	



Plate 18: Section of wall (feature 15), from the northeast. Scale 1.0m.

16. Stony spread	PRN: 58573
Figure: 8 and 9	Plate: 19
NGR: SH 50958 52139	Period: Unknown
Description A spread of stones covers the field at this location around what has been identified as a possible medieval long-hut (feature 11). The stones may be representative of a demolition spread from the long-hut or may indicate that further structures or associated field systems may be present. Aside from the long-hut no other definite structures have been identified but this area is considered to be of high potential for buried remains and as such it is recommended that a watching brief be maintained during groundworks in this area.	
Category of importance: Unknown	
Level of impact: Low adverse direct physical	
Significance of effect: Unknown	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Watching brief during groundworks in this area	



Plate 19: Stony spread (feature 16), from the south.

17. Ditch	PRN: 58574
Figure: 8 and 9	Plate: 20
NGR: SH 50929 52179 – SH 50955 52191	Period: Unknown
<p>Description A ditch measuring approximately 1.0m in depth and 2.0m in width runs from northeast to southwest to the immediate southeast of field wall feature 9. The ditch appears to have been excavated to drain the marshy land into the minor stream channel to the southwest, although the age of the ditch is unknown. The site is not depicted on the first, second and third edition 25" Ordnance Survey maps of 1889, 1900 and 1916 respectively (figures 5, 6 and 7) although it was almost certainly too ephemeral in nature to have been depicted.</p> <p>This feature will require breaching by the proposed works and as such it is recommended that a watching brief be maintained during groundworks in this area.</p>	
Category of importance: Unknown	
Level of impact: Low adverse direct physical	
Significance of effect: Unknown	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Watching brief during groundworks in close proximity	



Plate 20: Ditch (feature 17), from the southwest. Scale 1.0m.

18. Flat terrace	PRN: 58575
Figure: 8 and 9	Plate: 21
NGR: SH 50848 52306	Period: Unknown (prehistoric/ Romano-British)
<p>Description</p> <p>A flat terrace measuring approximately 100.0m in length by 30.0m in width and orientated from northeast to southwest is located between field wall feature 8 in the north and an area of steeply sloped ground in the south. The terrace has clearly been agriculturally improved and flattened and may be a prehistoric or Romano-British agricultural paddock or field system. There is also the possibility that this terrace was created later but the presence of suspected prehistoric or Romano-British lynchets (features 1 and 4) to the north increases the possibility of this terrace belonging to that time period. There are no associated upstanding remains within the terraced area but there is the increased possibility of buried remains.</p> <p>This area will require breaching by the proposed works and as such it is recommended that a watching brief be maintained during groundworks in this area.</p>	
Category of importance: Unknown (national)	
Level of impact: Low adverse direct physical	
Significance of effect: Unknown (moderate or slight adverse)	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Watching brief during groundworks in this area	



Plate 21: Terrace (feature 18), from the southeast.

19. Flat terrace	PRN: 58576
Figure: 8 and 9	Plate: 22
NGR: SH 50753 52451	Period: Unknown (prehistoric/ Romano-British)
<p>Description</p> <p>A flat terrace measuring approximately 60.0m in length by 20.0m in width and orientated from northeast to southwest is located to the immediate south of possible prehistoric or Romano-British lynchet feature 4. The terrace has clearly been agriculturally improved and flattened and may be a prehistoric or Romano-British agricultural paddock or field system. There is also the possibility that this terrace was created later but the presence of suspected prehistoric or Romano-British lynchets (features 1 and 4) to the north increases the possibility of this terrace belonging to that time period. There are no associated upstanding remains within the terraced area but there is the increased possibility of buried remains.</p> <p>This area will require breaching by the proposed works and as such it is recommended that a watching brief be maintained during groundworks in this area.</p>	
Category of importance: Unknown (national)	
Level of impact: Low adverse direct physical	
Significance of effect: Unknown (moderate or slight adverse)	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Watching brief during groundworks in this area	



Plate 22: Terrace (feature 19), from the northeast. Scale 1.0m.

20. Flat terrace	PRN: 58577
Figure: 8 and 9	Plate: 23
NGR: SH 50732 52454	Period: Unknown (prehistoric/ Romano-British)
<p>Description</p> <p>A flat terrace measuring approximately 60.0m in length by 25.0m in width and orientated from northeast to southwest is located to the immediate north of possible prehistoric or Romano-British lynchets feature 4 and to the west of relict field wall feature 5. The terrace has clearly been agriculturally improved and flattened and may be a prehistoric or Romano-British agricultural paddock or field system. There is also the possibility that this terrace was created later but the presence of suspected prehistoric or Romano-British lynchets (features 1 and 4) increases the possibility of this terrace belonging to that time period. There are no associated upstanding remains within the terraced area but there is the increased possibility of buried remains.</p> <p>This area will require breaching by the proposed works and as such it is recommended that a watching brief be maintained during groundworks in this area.</p>	
Category of importance: Unknown (national)	
Level of impact: Low adverse direct physical	
Significance of effect: Unknown (moderate or slight adverse)	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Watching brief during groundworks in this area	



Plate 23: Terrace (feature 20), from the northeast. Scale 1.0m.

Table 2: Summary of archaeological features. GREEN = no action required; RED= Action required						
Number	Name	Importance	Impact	Significance of effect	Further Assessment	Mitigation Recommendations
PHYSICAL DIRECT AND INDIRECT IMPACTS						
1	Revetment wall	Unknown (national)	Low adverse direct physical	Unknown (moderate or slight adverse)	None	Watching brief during revetment breach and basic record of profile
2	Trackway	Local	Low adverse direct physical	Neutral or slight adverse	None	Basic record – complete
3	Stone cairn	Unknown (negligible)	None	Neutral	None	None
4	Revetment wall	Unknown (national)	None	Neutral	None	None
5	Relict field wall	Unknown (national)	None	Neutral	None	None
6	Clawdd wall	Local	Low adverse direct physical	Neutral or slight adverse	None	Basic record – complete
7	Bank and ditch	Unknown	None	Neutral	None	None
8	Field wall	Local	None	Neutral	None	None
9	Clawdd wall	Local	Low adverse direct physical	Neutral or slight adverse	None	Basic record – complete
10	Field wall	Local	None	Neutral	None	None
11	Possible long-hut	Unknown (national)	None	Neutral	None	Watching brief during groundworks in close proximity
12	Possible hut-circle	Unknown (national)	None	Neutral	None	Watching brief during groundworks in close proximity
13	Possible long-hut	Unknown (national)	None	Neutral	None	Watching brief during groundworks in close proximity
14	Boulder field	Unknown	Low adverse direct physical	Unknown	None	Watching brief during groundworks in this area

15	Section of wall	Unknown	None	Neutral	None	Watching brief during groundworks in close proximity
16	Stony spread	Unknown	Low adverse direct physical	Unknown	None	Watching brief during groundworks in this area
17	Ditch	Unknown	Low adverse direct physical	Unknown	None	Watching brief during groundworks in close proximity
18	Flat terrace	Unknown (national)	Low adverse direct physical	Unknown (moderate or slight adverse)	None	Watching brief during groundworks in this area
19	Flat terrace	Unknown (national)	Low adverse direct physical	Unknown (moderate or slight adverse)	None	Watching brief during groundworks in this area
20	Flat terrace	Unknown (national)	Low adverse direct physical	Unknown (moderate or slight adverse)	None	Watching brief during groundworks in this area

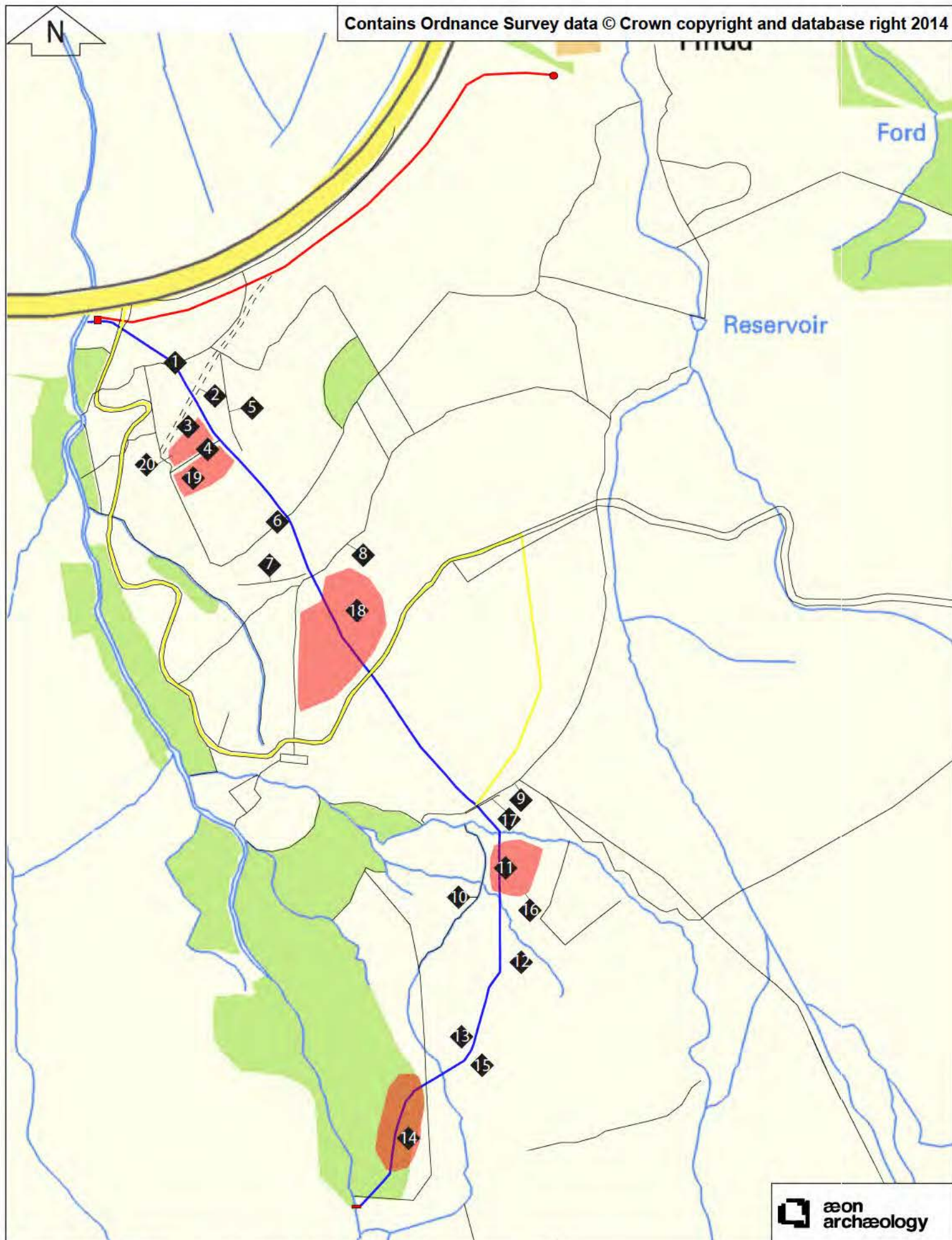


Figure 08: Location of archaeological sites (black diamonds and red shaded areas) identified during the site visit (numbers refer to the feature number - see report section 7.0).
Scale 1:3,500 at A4.

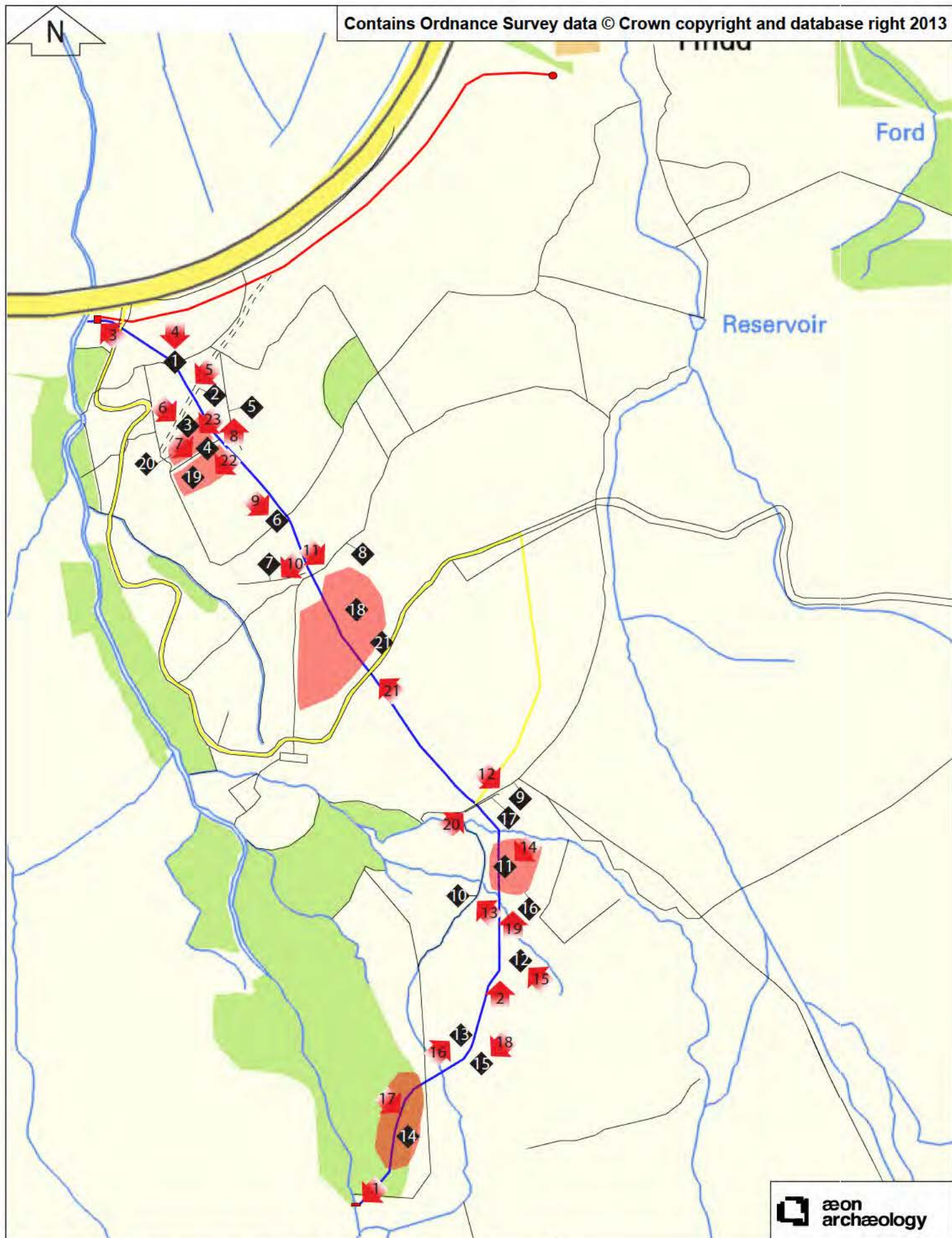


Figure 09: Location and orientation of photographs (red arrows). (numbers refer to plate number). Scale 1:3,500 at A4.



8.0 Impact and Recommendations

8.0 IMPACT AND RECOMMENDATIONS

8.1 Direct physical impact

Construction phase

The proposed development scheme is expected to have a *low adverse direct physical* impact upon ten sites of suspected archaeological importance (features 1, 2, 6, 9, 14, 16-20) during the construction phase. Of these, three sites (trackway feature 2, and cloddiau features 6 and 9) are considered to be of *local* importance and as such the significance of effect is expected to be *neutral or slight adverse*.

Four sites (revetment wall feature 1, and flat terraces features 18, 19, and 20) are of *unknown* importance but are suspected to be of *national* importance if correctly identified. As such the significance of effect of the proposed development is also *unknown* but is suspected to be *moderate or slight adverse* upon these features.

Four further sites (boulder field feature 14, section of wall feature 15, stony spread feature 16, and ditch feature 17) are of *unknown* importance and as such the significance of effect upon these four sites remains *unknown*.

Completion phase

The proposed development scheme is not expected to have any direct physical impact upon any known sites of archaeological and historical significance upon completion.

8.2 Indirect physical and non-physical (visual) impact

Construction phase

The proposed development scheme is not expected to have any indirect physical or non-physical impacts upon any known sites of archaeological and historical significance during the construction phase.

Completion phase

The proposed development scheme is not expected to have any indirect physical or non-physical impacts upon any known sites of archaeological and historical significance upon completion.

8.3 Historic Landscapes

The proposed development site currently lies within the *Nantlle valley lower slopes* (HLCA: 37), and the *Floor of Nantlle valley* (HLCA: 49) Historic Landscape Character Areas. Due to the proposal to bury the hydro penstock it is not expected that there will be a loss or alteration to any of the historic landscape character areas.

8.4 Site Specific Recommendations

It is recommended that a watching brief be maintained during the breaching of revetment wall (feature 1) in order to ascertain if the feature is prehistoric/ Romano-British in date and to record its structural composition. In addition recommendations have been made for a watching brief during the breaching of the ditch (feature 17) which is currently of unknown age.

Due to the potential for associated preserved buried remains in proximity of the possible medieval long-hut (feature 11), possible prehistoric/ Romano-British hut-circle (feature 12), possible medieval long-hut (feature 13), and section of wall (feature 15) it has been recommended that a watching brief be maintained during groundworks in close proximity to these sites. Furthermore, the boulder field (feature 14), stony spread (feature 16), and flat terraces (features 18-20) have been identified as areas of high potential for preserved buried remains and as such it is recommended that a watching brief be maintained in these areas.

8.5 General recommendations

There are a plethora of nationally important archaeological sites within reasonably close proximity of the proposed hydro scheme. However site specific recommendations have been made for a watching brief to be maintained in the vicinity of a number of sites (section 8.4) and as such this should provide suitable monitoring in the chance that associated archaeological remains are uncovered. As such there are no general recommendations for further assessment or mitigatory measures in relation to the scheme.



9.0 Sources

9.0 SOURCES

OS Maps

1st edition 25 inch Ordnance Survey Map of 1889.

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3rd edition 25 inch Ordnance Survey Map of 1916.

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Aerial Photographs

OS Aerial Photographs

2006, 2009, 2010, 2013 Google mapping

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Appendix I:
Scheduled and Non-Scheduled Sites within 1km

APPENDIX 1: SCHEDULED AND NON-SCHEDULED SITES WITHIN 1.0KM

Undesignated monuments within 1.0km of the proposed development area as listed on the Gwynedd HER (figure 2)

PRN	Name	Type	Broadclass	Period
2782	Stone Mould - Findspot, Nantlle	Findspot	Object	Prehistoric
2784	U-Grooved Stone - Findspot, Nantlle	Findspot	Object	Unknown
2785	Urn and Cairn, Nantlle	Findspot	Object	Prehistoric
2786	Rotary Quern - Findspot, Nr Nantlle	Findspot	Object	Unknown
5349	Ty Mawr, Llandwrog	House	Domestic	Post-Medieval
6251	Linear Feature, Cwm Silyn	Peat stand	Unassigned	Unknown
6258	Sheepfold, NW Cwm Silyn	Sheep fold	Agriculture and Subsistence	Unknown
6287	Enclosure, Y Ffridd	Enclosure	Agriculture and Subsistence	Unknown
6288	Hut Circle, W of Afon Craig Las	Hut circle	Domestic	Prehistoric
6313	Hut Circle, E of Afon Craig Las	Hut circle	Domestic	Prehistoric
6314	Area of Ridge and Furrow, S of Gwernoer Farm	Ridge and furrow	Agriculture and Subsistence	Unknown
6348	2 Long Huts, S of Dyffryn Nantlle	Long hut	Domestic	Medieval
6471	Area of Ridge and Furrow, Y Ffridd	Ridge and furrow	Agriculture and Subsistence	Unknown
6837	Rectangular Structure, Cwm Tal y Mignedd	Structure	Unassigned	Unknown
6884	Peat Stack, Cwm Silyn	Peat stand	Industrial	Unknown
7305	?Long Hut, Nantlle	Long hut	Domestic	Medieval
7323	Baladeulyn Medieval Township	Township	Domestic; Civil	Medieval
15712	Nantlle Village - Landscape	Landscape	Unassigned	Multi-Period
15736	Nantlle Valley Lower Slopes - Landscape	Landscape	Unassigned	Multi-Period
20029	Slate Quarry, Ty Mawr Green	Slate quarry	Industrial	Post-Medieval
20030	Ty Mawr East Slate Quarry, Nantlle	Slate quarry	Industrial	Post-Medieval

20033	Dorothea Slate Quarry, Nantlle	Slate quarry	Industrial	Post-Medieval
20035	Gwernor Slate Quarry, Nantlle	Slate quarry	Industrial	Post-Medieval
20036	Cloddfa'r Lon Slate Quarry, Nantlle	Slate quarry	Industrial	Post-Medieval
20038	Slate Quarry, Wern Ifan	Slate quarry	Industrial	Post-Medieval
20541	Copper Mine, Ty Mawr, Nantlle	Copper mine	Industrial	Post-Medieval
21586	Cwm Silyn Mine	Manganese mine	Industrial	Post-Medieval
21620	Gwernor Mine	Copper mine	Industrial	Post-Medieval
21948	Quarrymen's Cottages, Ty Mawr, Nantlle	Cottage	Domestic	Post-Medieval
34849	Shaft Head, Pen yr Orsedd Quarry	Shaft	Industrial	Post-Medieval

Undesignated new monument points within 1.0km of the proposed development area as listed on the Gwynedd HER (figure 2)

PRN	Name	Type	Period
22529	Ffridd	Farmstead	Post Medieval
22530	Ffridd sheepfold	Sheepfold	Post Medieval
22534	Building SW of Ffridd farmstead	Building	Post Medieval
22535	Ffridd field barn	Field barn	Post Medieval
22536	Ffridd reservoir	Reservoir	Post Medieval
22536	Field boundary S of Ffridd farmstead	Field wall	Prehistoric?
22537	Field wall SW of Ffridd farmstead	Field wall	Medieval?
22538	Rectangular enclosure S of Ffridd farmstead	Enclosure	Post Medieval
22539	Sheepfold S of Ffridd farmstead I	Sheepfold	Medieval
22540	Field barn SW of Ffridd farmstead	Field barn	Post Medieval
22542	Trackway S of Ffridd farmstead	Trackway	Post Medieval
22544	Sheepfold S of Ffridd farmstead II	Sheepfold	Medieval
22545	Stone, S of Ffridd farmstead	Standing stone / rubbing	Medieval
22546	Sheepfold and enclosure S of Ffridd farmstead	Sheepfold and enclosure	Medieval
22547	Sheepfold S of Ffridd farmstead III	Sheepfold	Medieval
22548	Leat N of Cwm Silin	Leat	Post Medieval
22549	Shelter N of Cwm Silin	Shelter	Post Medieval
22550	Sheepfold N of Cwm Silin	Sheepfold	Post Medieval

Scheduled Ancient Monuments within 1.0km of the proposed development area (figure 2)

SAM no.	Name	Type	General	Broadclass
CN199	Dorothea Quarry, Pyramids, Inclines, Mill & Winding Houses, etc	Engine house	Post-Medieval/Modern	Industrial
CN300	Ty Mawr East Slate Quarry Winding Engine House	Engine house	Post-Medieval/Modern	Industrial
CN302	Cloddfa'r Lon Slate Quarry	Slate mill	Post-Medieval/Modern	Industrial

Listed Buildings within 1.0km of the proposed development area (figure 3).

Number	Name	Locality	Grade
22899	Ty Mawr	Nantlle	II*
22900	Pen-y-bryn	Nantlle	II
23679	Bryn Deulyn	Nantlle	II
23680	Coach house/wash house and stables at Bryn Deulyn	Nantlle	II
23682	Former Dairy to north-west of Ty Mawr	Nantlle	II
23683	Former Quarrymen's Barracks to north-west of Ty Mawr (east range)	Nantlle	II
23684	No 1 Tai Baladeulyn	Nantlle	II
23688	North-eastern aerial ropeway revetment, incline and associated buildings	Nantlle	II
23728	Strainer arches and retaining walls	Nantlle	II
23748	West and south ranges of building at former quarrymen's barracks to north-west of Ty Mawr	Nantlle	II
23749	No 2 Tai Baladeulyn	Nantlle	II
23750	No 3 Tai Baladeulyn	Nantlle	II
23751	No 4 Tai Baladeulyn	Nantlle	II
23752	No 5 Tai Baladeulyn	Nantlle	II

NMR Monument Points within 1.0km of the proposed development area (figure 3)

NPRN	Name	Broadclass	Type	Period
6914	Baladeulyn welsh calvinistic methodist chapel, nantlle	Religious, ritual and funerary	Chapel	Post medieval
16960	Ty mawr, nantlle	Domestic	Major dwelling	Post medieval
33673	Dorothea quarry engine house	Industrial	Engine house	Post medieval
33674	Pen-y-bryn, quarry	Industrial	Engine house	Post medieval
40539	Dorothea quarry (general)	Industrial	Quarry	Post medieval;19th century
40540	Dorothea quarry, quarry building	Industrial	Quarry building	Post medieval
40541	Dorothea quarry-dressing sheds	Industrial	Dressing shed	Post medieval
40545	Dorothea quarry, slate loading bank	Industrial	Quarry	Post medieval
40546	Dorothea quarry - tramway arch	Transport	Causeway	Post medieval
40547	Dorothea quarry - weighbridge	Transport	Weighbridge	Post medieval
40548	Dorothea quarry	Industrial	Winder house	Post medieval
40551	Dorothea quarry	Industrial	Winder house	Post medieval
86277	Baladeulyn, garden, nantlle	Gardens, parks and urban spaces	Garden	Post medieval?
275742	Ty mawr east slate quarry winding engine house	Industrial	Engine house	Post medieval;modern
275743	Cloddfa'r lon slate quarry;cloddfa'r coed;glodfa goed	Industrial	Slate quarry	Post medieval;modern
287226	South of fridd sheep fold i	Agriculture and subsistence	Sheep fold	Post medieval
287227	South of fridd boundary stone	Civil	Boundary stone	Post medieval?
287228	South of fridd hut circle settlement	Agriculture and subsistence	Hut circle settlement	Iron age
287229	South of fridd structure	Domestic	Structure	Iron age?
287230	South of fridd sheep shelter	Agriculture and subsistence	Sheep shelter	Post medieval
287231	Cwm silyn trial mine i	Industrial	Trial mine	Post medieval
287232	Cwm silyn trial mine ii	Industrial	Trial mine	Post medieval
287243	West of afon craig-las cairn	Religious, ritual and	Cairn	Bronze age

		funerary		
287244	West of afon craig-las sheep fold i	Agriculture and subsistence	Sheep fold	Post medieval
287245	South of fridd hut circle	Domestic	Hut circle	Iron age
287246	South of fridd sheep fold ii	Agriculture and subsistence	Sheep fold	Post medieval
287247	South of fridd wall	Agriculture and subsistence	Wall	Post medieval
287248	South of fridd sheep fold iii	Agriculture and subsistence	Sheep fold	Post medieval
287249	South east of bryn-llidiard sheep fold i	Agriculture and subsistence	Sheep fold	Post medieval
287250	South east of bryn-llidiard sheep fold ii	Agriculture and subsistence	Sheep fold	Post medieval
287251	South east of bryn-llidiard boundary stone	Civil	Boundary stone	Post medieval
287252	North west of llynau cwm silyn sheep fold i	Agriculture and subsistence	Sheep fold	Post medieval
287253	North west of llynau cwm silyn sheep fold ii	Agriculture and subsistence	Sheep fold	Post medieval
287254	North west of llynau cwm silyn sheep fold iii	Agriculture and subsistence	Sheep fold	Post medieval
287255	South east of bryn-llidiard sheep fold iii	Agriculture and subsistence	Sheep fold	Post medieval
287256	South east of bryn-llidiard shelter	Agriculture and subsistence	Shelter	Post medieval
287257	South east of bryn-llidiard trial mine	Industrial	Trial mine	Post medieval
287258	East of bryn-llidiard cairnfield	Agriculture and subsistence	Cairnfield	Prehistoric?
287259	East of bryn-llidiard cairn	Religious, ritual and funerary	Cairn	Bronze age?
287260	East of bryn-llidiard field system	Agriculture and subsistence	Field system	Iron age;medieval
287261	East of bryn-llidiard stock enclosure	Agriculture and subsistence	Stock enclosure	Iron age
287266	South east of bryn-llidiard wall	Agriculture and subsistence	Wall	Iron age
287271	South east of bryn-llidiard field system	Agriculture and subsistence	Field system	Iron age;medieval
287272	South east of bryn-llidiard longhouse	Domestic	Longhouse	Medieval
287273	South east of bryn-llidiard hut circle iii	Domestic	Hut circle	Iron age
287274	South east of bryn-llidiard platform house	Domestic	House platform	Medieval
287275	South east of bryn-llidiard cairn	Religious, ritual and funerary	Cairn	Prehistoric
287276	North west of llynau cwm silyn sheep fold iv	Agriculture and subsistence	Sheep fold	Post medieval

287277	West of afon craig-las hut circle settlement	Agriculture and subsistence	Hut circle settlement	Iron age
287280	West of afon craig-las house platform	Domestic	House platform	Medieval?
287281	West of afon craig-las longhouse	Domestic	Longhouse	Medieval
288218	Cairn, garnedd-goch w flank	Religious, ritual and funerary	Cairn	Unknown
301501	Ty mawr dairy and stables, nantlle	Domestic	Dairy	Post medieval
308978	Gwernoer, field system	Agriculture and subsistence	Field system	Unknown
400634	Ty mawr slate quarry (nantlle vale slate quarry)	Industrial	Slate quarry	Post medieval
401179	Ty coch, ruins sse of	Unassigned	Building	Post medieval
403098	Former quarrymens barracks to the north west of ty mawr, nantlle	Domestic	Barracks	Post medieval
403099	West and south ranges of former quarrymens barracks to north west of ty mawr, nantlle	Agriculture and subsistence	Cow shed;outbuilding	Post medieval

Historic Landscape Character areas (HLCAs) within 1.0km of the proposed pipeline route (figure 4)

HLCA	HLCA name	Landscape
9	Nantlle slate quarries	GW9
13	Nantlle village	GW9
37	Nantlle valley lower slopes	GW9
42	Nantlle valley upper slopes	GW9
49	Floor of Nantlle valley	GW9



Appendix II: Definitions of further assessment and mitigatory measures

APPENDIX 2: DEFINITIONS OF FURTHER ASSESSMENT AND MITIGATORY MEASURES

1. 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 on 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.

2. 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 in to 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.



**Appendix III:
Written Scheme of Investigation (WSI)**

WRITTEN SCHEME OF INVESTIGATION (WSI) FOR ARCHAEOLOGICAL DESK-BASED ASSESSMENT v1.0

PROJECT CODE: A0034.1

SITE: Ty Coch Hydro Scheme, Nantlle, Gwynedd

NGR: Intake SH 50850 51890, turbine house SH 50660 52540

PLANNING REF: NP3/22/88

DATE: 19th March 2014

PREPARED FOR: Greenearth Hydro Ltd

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1. PROJECT SUMMARY

Aeon Archaeology has been asked by Greenearth Hydro Ltd to provide a cost and project design for carrying out an archaeological desk-based assessment and field visit of a proposed hydro-electric scheme with turbine house, penstock (pipeline), and electrical cable connection. The proposed scheme intake is to be located on the eastern bank of the Afon Ty Coch, an outfall stream of Llynnau Cwm Silyn and a tributary of the Afon Llyfni, approximately 1.4km southwest of the village of Nantlle, Gwynedd and within the Snowdonia National Park Authority (SNPA).

The proposed scheme will consist of an intake weir located at NGR SH 50850 51890 and a c.890.0m long buried penstock (pipe) initially running southwest to northeast before turning and heading northwest to a new turbine house located at NGR SH 50660 52540. The hydro scheme will then empty back into the Afon Ty Coch via a 4.0m long buried outfall pipe running west from the turbine. In addition a buried new power cable will run northeast from the turbine house for approximately 0.4km to a new meter and 200kVA transformer.

A mitigation brief has not been prepared for this scheme by the SNPA Archaeologist, but full planning permission has been granted with the following archaeological condition:

Prior to any work commencing (including any ground disturbance works or ground clearance) pursuant to this permission the applicant/developer shall submit to and receive written approval from the Local Planning Authority for an archaeological specification for a programme of works which must meet all relevant archaeological standards. The development shall subsequently be carried out in strict accordance with the approved programme of works unless otherwise agreed to in writing by the Local Planning Authority (condition 5, planning application NP3/22/88).

The reason for this condition is:

To ensure the implementation of an appropriate programme of archaeological mitigation in accordance with the requirements of Planning Policy Wales 2010 and Welsh Office Circular 60/96 Planning and the Historic Environment: Archaeology.

In accordance with the Institute for Archaeologists (IfA) Code of Practice it is recommended that the content of this project design be approved by the SNPA Archaeologist prior to the commencement of work.

This design will conform to the guidelines specified in *Standard and Guidance for Archaeological Desk-based Assessment* (Institute of Field Archaeologists, 1994, rev. 2001, 2008).

2. STATUTORY AND NON-STATUTORY DESIGNATIONS

The scheme lies within or in proximity to the following statutorily designated areas:

- Within the Snowdonia National Park Authority (SNPA).
- Approximately 738.0m east of the post-medieval *Ty Mawr East Slate Quarry Winding Engine House* Scheduled Ancient Monument (CN300).
- Approximately 783.0m southeast of the post-medieval *Dorothea Quarry, Pyramids, Inclines, Mill & Winding Houses, etc* Scheduled Ancient Monument (CN199).

- Approximately 887.0m southeast of the post-medieval *Cloddfa'r Lon Slate Quarry* Scheduled Ancient Monument (CN302).

3. ARCHAEOLOGICAL BACKGROUND

The proposed scheme is considered to be within an area of high archaeological potential. Features of late prehistoric/ Roman period including the remains of round huts and associated field systems, as well as of the medieval period including traces of ridge and furrow and areas of past cultivation, are recorded on the regional Historic Environment Record (HER) and the National Monument Record (NMR) within 500.0m of the proposed development. Although there are no recorded features within the application boundary, a late prehistoric/ Roman period round hut is located approximately 80.0m southeast of the hydro-electric intake point, and associated features such as relict field walls may extend into the proposed development area.

Moreover, there is the potential for unknown buried archaeological remains to extend into the development area that have no upstanding visible remains.

4. ARCHAEOLOGICAL AIMS

The general aim of the archaeological desk-based assessment is to identify elements of archaeological and architectural heritage value that may be impacted upon by the proposed development at Ty Coch, Nantlle, Gwynedd. The evidence presented and the conclusions offered will provide a comprehensive basis for further discussion and decisions regarding necessary programmes of further archaeological assessment and/or mitigatory response.

The objectives to be undertaken in pursuing this study will be focused on assessing the cultural significance of the historic assets to be affected by the proposed development through examining a variety of evidence for upstanding and buried remains in proximity of the penstock route.

The detailed aims of the archaeological assessment are:

- to identify and record archaeological and historical assets within a 40.0m wide assessment corridor centred on the penstock route;
- to evaluate the importance of the identified archaeological and historical assets;
- to recommend ways in which impact upon the archaeological and cultural assets identified can be avoided, negated, or mitigated for.

For the above aims to be met it is sometimes necessary to undertake a programme of field evaluation once the archaeological desk-based assessment has been completed. This is sometimes required as not all sites can be assessed by desk-based work alone, and may require additional investigation to correctly identify or evaluate them. This usually takes the form of a geophysical survey or trial excavation, although measured survey, supervised metal detector survey, and other forms of non-intrusive geophysical survey can sometimes be used.

The archaeological desk-based assessment will make recommendations for any further investigation/ evaluation work if and when required.

5. PROGRAMME OF WORK

5.1 Introduction

The archaeological desk-based assessment will consider the following:

- The history of the site;
- The identification and significance of any archaeological sites found;
- The assessment of impact of development on archaeological remains;
- The assessment of impact of development on the setting of sites of archaeological importance;
- The assessment of the significance of effect of the development on archaeological remains;
- The requirements for further assessment in the form of non-intrusive and intrusive field evaluation.

The archaeological desk-based assessment will be undertaken in four stages:

- Archival research
- Site walkover
- Written report
- Project archive

5.2 Archival Research

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

- The regional Historic Environment Record (Gwynedd Archaeological Trust, Craig Beuno, Garth Road, Bangor, LL57 2RT) will be examined for information concerning the study area. This will include an examination of the core HER, and secondary information held within the record which includes unpublished reports, the 1:2500 County Series Ordnance Survey maps, and the National Archaeological Record index cards.
- The National Monuments Record (NMR RCAHMW, National Monuments Record of Wales, Plas Crug, Aberystwyth, SY23 1NJ) will be checked for sites additional to the HER, and if required additional supporting information will be examined at the NMR.
- Information about Listed Buildings and Scheduled Ancient Monuments from Cadw will be examined in the regional HER, with supporting information from Cadw if required. The Register of Outstanding and Special Historic Landscapes and the Register of Parks and Gardens will be checked, and also the location of World Heritage Sites.
- Secondary sources will be examined, including the Inventories of the Royal Commission on Ancient and Historical Monuments for Wales, and works held within the regional libraries. Indices to relevant journals, including county history and archaeology society journals and national society journals such as *Archaeologia Cambrensis* will be checked. Also at this stage 19th century topographical dictionaries, antiquarian tours and trade directories will be examined where relevant.
- Evidence from aerial photographs will be collated. Vertical and oblique collections held by the NMR, CCW and Welsh Government will be considered for examination. All photographs examined will be listed in the assessment report.
- Archive maps, where relevant, will be consulted in the National Library of Wales at Aberystwyth, and at the Gwynedd archives. This will include the relevant estate maps and

tithe maps and information from Land Tax Assessments. Where relevant antiquarian prints and photographs from the national and regional archives will be examined.

- Results from previous archaeological work within the area will also be reviewed.

5.3 Site Walkover

The site walkover will involve a visit of the proposed development site and its immediate environs by a suitably qualified archaeologist. As part of this scheme the site walkover will include the entire length of the pipeline route from intake weir to power house, outfall pipe route, cable route and transformer house, and the proposed access route; and will include an assessment corridor some 40.0m width centred upon the pipeline route. Any upstanding or physical remains of sites identified during the archival research stage will be assessed, and any new sites noted will be assessed. All sites observed will be photographed using a digital SLR camera (Canon 550D) set to maximum resolution, and photographs will be taken from, to, and between significant viewpoints if deemed necessary. The potential locations for well preserved environmental deposits will be noted. All sites will be assigned a twelve figure national grid reference.

Access onto land is to be arranged by the Clients.

5.4 Field Evaluation/Further Works

The archaeological desk-based assessment will make recommendations for a programme of field evaluation of further works if required. These works are necessary when an archaeological or historical asset(s) cannot be assigned a category of importance because further assessment work is required to ascertain this level. Further evaluation work, if necessary, will often take the form of a geophysical survey or programme of trial trenching, but may also include measured survey, supervised metal detector survey, and other forms of non-intrusive geophysical survey. Recommendations for any field evaluation considered necessary will be contained within the archaeological desk-based assessment report.

Specific attention will be paid during the assessment as to the suitability of the vegetation and geology for geophysical survey.

5.5 Data processing and report compilation

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

Non-technical summary

1. Introduction
2. Aims
3. Specification and Project Design
4. Methods and techniques, including details and location of project archive
5. Archaeological and Topographical Background
6. Results of assessment in the form of a gazetteer
7. Assessment of impacts
8. Proposals for field evaluation and/or mitigation
9. Summary and conclusions
10. List of sources consulted.

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. Photographs of relevant sites and of the study area where appropriate will be included.

A draft copy of the report will be sent to the SNPA Archaeologist and to the client prior to production of the final report.

5.6 Definition of category of importance

To assess the importance of sites and to allow the appropriate mitigatory action to be proposed for each, a framework of categories will be used with each site allocated to a particular category according to its relative importance:

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.
Unknown	Archaeological sites whose importance cannot be determined with the information currently at hand. This can include sites where the extent of buried remains is unknown.

6. ARCHIVING

A full archive including plans, photographs, written material and any other material resulting from the project will be prepared. All plans, photographs and descriptions will be labelled, and cross-referenced, and lodged in an appropriate place within six months of the completion of the project.

Bound copies of the report and an archive CD will be sent to the regional HER (Gwynedd Archaeological Trust, Craig Beuno, Garth Road, Bangor, Gwynedd LL57 2RT) (x 2#), the SNPA archaeologist (x 2#) and to National Monument Record, of the Royal Commission on the Ancient and Historic Monuments of Wales (RCAHMW) (x 1#) for long term archiving. Furthermore, a summary of the project will be sent to *Archaeology in Wales* for publication. Copies of all digital files (inc. photos, report as PDF and Word, spreadsheets, databases, survey data etc) to be presented to each of above on optical disc (ie DVD).

7. PERSONNEL

The work will be managed and undertaken by Richard Cooke BA MA MifA, Archaeological Contractor and Consultant at Aeon Archaeology. Full details of personnel involved, with *curricula vitae*, can be supplied upon request.

8. MONITORING

Monitoring visits can be arranged during the course of the project with the clients and with the SNPA Archaeologist.

9. HEALTH AND SAFETY

Aeon Archaeology has a Health and Safety Policy Statement which can be supplied upon request. Furthermore, site-specific Risk Assessments and Method Statements are compiled and distributed to every member of staff involved with the project prior to the commencement of works.

10. INSURANCE

Liability Insurance – Towergate Insurance Policy 000467

Employers' Liability: Limit of Indemnity £10m in any one occurrence

Public Liability: Limit of Indemnity £2m in any one occurrence

Legal Defence Costs (Health and Safety at Work Act): £250,000

The current period expires 30/09/14

Professional Indemnity Insurance – Towergate Insurance Policy 2011025521290

Limit of Indemnity £500,000 any one claim

The current period expires 30/09/14

11. SOURCES CONSULTED

Archwilio: Gwynedd online HER.

Standard and Guidance for Archaeological Desk-based Assessment (Institute of Field Archaeologists, 1994, rev. 2001 & 2008)

COST ESTIMATE

Desk based assessment	2 days	
Field visit	1 day	
Report, illustration and archiving	2.5 days	

By commissioning Aeon Archaeology to undertake this work the client agrees to be invoiced directly at the end of each calendar month for works to date or once the project concludes, whichever occurs first. In addition, the client agrees to pay the invoice no more than 1 calendar month after issue from Aeon Archaeology.

