

# Hydro-Electric Pipeline Dolgarrog, Conwy

Archaeological Assessment of Access Routes



Ymddiriedolaeth Archaeolegol Gwynedd  
Gwynedd Archaeological Trust

# Hydro-Electric Pipeline Dolgarrog, Conwy

## Archaeological Assessment of Access Routes

Project No. G2158

Prepared for : Capita Symonds on behalf of RWE Npower Renewables Ltd

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Front cover : Field boundaries in Ardda medieval township

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# HYDRO-ELECTRIC PIPELINE, DOLGARROG

## ARCHAEOLOGICAL ASSESSMENT OF ACCESS ROUTES

Project No. G2158; Gwynedd Archaeological Trust Report No. 975

### CONTENTS

<i>SUMMARY</i> .....	2
1. INTRODUCTION .....	2
2. DESIGN BRIEF AND SPECIFICATION.....	2
3. METHODS AND TECHNIQUES.....	3
4. ARCHAEOLOGICAL RESULTS.....	4
5. SUMMARY OF ARCHAEOLOGICAL POTENTIAL .....	8
6. SUMMARY OF RECOMMENDATIONS .....	10
7. GENERAL RECOMMENDATIONS.....	12
8. CONCLUSIONS.....	14
9. ARCHIVE.....	14
10. REFERENCES AND OTHER SOURCES CONSULTED .....	14
APPENDIX 1: Sites previously listed on Gwynedd HER and National Monument Register .....	17
APPENDIX 2: Definition of terms .....	21
APPENDIX 3: Gazetteer of sites found during the desk-based assessment and field walk-over .....	24
APPENDIX 4: Table describing segments of wall running along northern access route .....	37

### Figures

- Figure 1. Location of access routes and archaeological sites in the general area
- Figure 2. Ardda in the parish of Dolgarrog, Holland Estate map dating to 1780s (UWB Archives Bangor Ms 2383), with relevant part of the schedule. (Approximate access route in red)
- Figure 3. Coed Sadwrn, Coitia Hir and Pwll Du, from Glynllifon Estate map book dated 1788 (National Archives MS vol 96, p160). Approximate access route shown in red.
- Figure 4. Extract from the Dolgarrog tithe map of 1847 with entries from the tithe schedule for relevant properties (Conwy Archives)
- Figure 5. Extract from the Caerhun tithe map of 1846 with entries from the tithe schedule for relevant properties (Conwy Archives) (Access route shown in red)
- Figure 6. Extract from pages 176 and 177 of the book of estate maps from Lord Newborough's estate (1788) (NLW Ms maps Vol 96). Showing location of fulling mill and path to Ardda settlement with extract from the schedule referring to the fulling mill.
- Figure 7. British Electricity Authority plan showing Hydro-Electric Works at Dolgarrog (1950s). Sidney Colwyn Foulkes Collection, Conwy Archives (C/Maps 21/2/11/1/2)
- Figure 8. Sites along northern part of access route
- Figure 9. Railway incline PRN 16322 and adjacent sites showing proposed location of a compound (overlain on 1913 OS map)
- Figure 10. Ardda township area and southern part of access route (overlain on 1913 OS map)

### Plates

- Plate 1. Field boundaries adjacent to the track in the Ardda township, PRN 676 (from east)
- Plate 2. Cottage in Ardda township, PRN 679 (from north-east)
- Plate 3. Cottage in Ardda township, PRN 12957 (from north-east)
- Plate 4. Concrete water board road, PRN 12975, at a bend that may have to be widened (from south-west)
- Plate 5. Railway incline, PRN 16322, stone ramp from south-west
- Plate 6. Typical roadside walls, PRN 32145, from south-east
- Plate 7. Possible clearance cairn, PRN 32146, from north-east
- Plate 8. Galt Y Rhiw Stone, PRN 32148 (Copyright RCHAMW)
- Plate 9. Galt Y Rhiw trackway (PRN 32149) running at the base of a high terrace associated with PRN 12957
- Plate 10. Possible building platform, PRN 32151 (from south-east)
- Plate 11. Ardda enclosure II, PRN 32152 (from north-west)
- Plate 12. Tai-Isaf-Ardda enclosure, PRN 32154 (from north-west)
- Plate 13. Building platform, PRN 32158 (from south-east)
- Plate 14. Building platform, PRN 32159 (from south-west)
- Plate 15. Incline, PRN 32164 (from south-west)

# **DOLGARROG HYDRO-ELECTRIC PIPELINE (G2158)**

## **ARCHAEOLOGICAL ASSESSMENT OF ACCESS ROUTES**

### **SUMMARY**

*An archaeological assessment has been carried out on proposed access routes relating to the replacement of the upper section of a hydro-electric pipeline from the reservoir at Coedty to the Electricity Power Station at Dolgarrog, Conwy. This identified several new archaeological features in the area of the Ardda medieval township which may be impacted upon, and potential significant impact on the former railway incline.*

*This report provides a gazetteer of sites within the study area, and contains recommendations for mitigation and, where required, further evaluation*

### **1. INTRODUCTION**

Works are proposed on water pipelines which feed Dolgarrog Hydro Electric Power Station. It is proposed to replace the upper part of the existing pipe from Coedty Reservoir to the valve house with a new pipe. A new pipe is also to be constructed to replace the existing surge pipe to the south-west of the valve house. Gwynedd Archaeological Trust (GAT) has previously been asked by Capita Symonds, on behalf of their clients RWE Npower Renewables Ltd (RWE NRL), to carry out an initial scoping assessment of the general area (Evans 2010, GAT Report 900), which was superseded by a full archaeological assessment of the proposed pipeline route (Kenney 2011, GAT report 928). To obtain access for these works several routes have been proposed, as shown on figure 1, and this report provides an archaeological assessment of these routes and some minor alterations to the previous proposed plans, including changes in the location of compounds.

### **2. DESIGN BRIEF AND SPECIFICATION**

The majority of the length of the access routes will run along existing roads and tracks, which will need to be widened in places. There are two main routes to be used for different types of vehicles. The northern route for the majority of traffic follows the narrow public road that turns south from the road up the hill from Tal y Bont (SH7575 6793 to SH7584 6695). An alternative to part of this northern route is also proposed running below the leat to the east of this road. The southern route is to be used only to allow large tracked machines in to site at the start of the project and out again at the end. This uses the concrete water works road running by the Afon Ddu (SH7739 6633 to SH7708 6612). The route continues on the farm track, cuts across the fields to join the track running beside the lower leat. In one section of the southern route a field is to be crossed where there is no existing track. In this case no earthworks are to be carried out and vehicles will run on the existing grass surface. A short cut may be used to avoid widening part of the track by the leat (figure 1). This short cut crosses a rocky spur on the grass. The assessment will look at the various alternatives and give recommendations for the lowest archaeological impact.

The assessment will also consider alternative proposed locations for two of the site compounds, and the impact of replacing the existing surge pipe with a pipe running up the upper part of the railway incline above Marble Arch.

A desk-based assessment is defined as ‘a programme of assessment of the known or potential archaeological resource within a specified area or site on land, inter-tidal zone or underwater. It consists of a collation of existing written, graphic, photographic and electronic information in order to identify the likely character, extent, quality and worth of the known or potential archaeological resource in a local, regional, national or international context as appropriate’ (*Standard and Guidance for Archaeological Desk-based Assessment*, IFA 2001, 2).

The aims of the assessment as given in the specification are:

- to identify and record the cultural heritage within the defined study area;
- to evaluate the importance of what has been identified;

- to recommend ways in which impact upon the cultural heritage can be avoided or minimised.

To comply fully with the aims expressed above it can be necessary to undertake a programme of Field Evaluation following the Desktop study and Field Visit. This is because some sites cannot be assessed by desktop or field visit alone, and additional fieldwork is therefore required. This typically takes the form of geophysical survey or trial excavation, although measured survey is also a possible option. A full programme of assessment and evaluation may therefore consist of the following phases:

- Desktop study
- Field walkover
- Initial report
- Field evaluation
- Draft report
- Final report

This phase of the project concerns the first three of these phases, and recommendations are made concerning further archaeological evaluation or mitigation.

Curatorial responsibility for this project lies with Snowdonia National Park Authority and Conwy County Borough Council.

### **3. METHODS AND TECHNIQUES**

#### **3.1 Desktop study**

The desktop study comprised the consultation of maps, documents, computer records, written records and reference works, which form part of the Historic Environment Record (HER), located at Gwynedd Archaeological Trust (GAT), Bangor. A search of the archives held by the Conwy Archives, Llandudno, Bangor University and the National Archives, Aberystwyth was undertaken. Aerial photographs from the Aerial Photography Unit, Cardiff were also inspected.

Information about listed buildings was consulted by means of the CARN (Core Archaeological Index), which is the online index of the Royal Commission on Ancient and Historic Monuments, Wales. Information about an upland survey carried out by *Cambrian Archaeological Projects* (CAP) in 2002 over part of the study area was obtained from this source.

Sites, buildings and find spots within the study area listed in the GAT HER and the National Monuments Record (NMR) were identified. These are listed in Appendix 1 with PRN referring to the GAT HER unique Primary Record Number and NPRN referring to the National Primary Record Number. The previous assessments undertaken for the project (Kenney 2011, GAT report 928) identified numerous sites some of which are in the vicinity of the access routes. These were reassessed specifically in relation to the access routes and other issues addressed in this report.

#### **3.2 Field search**

The field search was undertaken on 1<sup>st</sup> September 2011. The northern route along the public road was walked and the roadside boundaries inspected, but the fields at either side of the road were not inspected as impact on these is not anticipated. The concrete track forming the southern access route was walked and the land immediately adjacent inspected. The track by the lower leat, previously the tramway to Llyn Cowlyd, was similarly inspected. The fields between these two sections of the route were inspected in full to identify any earthworks and recommended the best route to avoid these. The alternative avoiding a bend in the track was walked, but the alternative northern route along side the leat could not be accessed on 1<sup>st</sup> September and this will have to be inspected on a later date.

The impact of using the railway incline for the new surge pipe was considered and this area was inspected for a possible location of a compound. However there was very heavy bracken cover so any subtle earthworks would not have been detected. The new proposed location for compound 5, positioned near the junction of the northern access road and the leat, was also inspected on the ground, but this also suffered from bracken cover.

Notes were taken, sketches and measurements were taken of sites of potential archaeological interest and a photographic record was made. Sites were located by reference to modern and 19<sup>th</sup> century maps. Weather conditions were good but the problem of bracken obscuring sites related to a greater or lesser extent to much of the route.

### **3.3 Report**

The available information was synthesised to give a summary of the archaeological and historic background and of the assessment and recommendations, as set out below. The separate features, their evaluation and recommendations are listed separately, and a summary of the overall assessment of the area is given at the end.

The criteria used for assessing the value of features was based upon those used by the Secretary of State for Wales when considering sites for protection as scheduled ancient monuments, as set out in the Welsh Office circular 60/96. The definitions of categories of importance and of terms used for impact, recommended field evaluation and mitigation are set out in Appendix 2.

## **4. ARCHAEOLOGICAL RESULTS**

### **4.1 Topographic description**

(note: PRN = Primary Reference Number of a site listed in the regional Historic Environment Record)

The hydro-electric pipeline lies within the valley of the Afon Porthllwyd. However the access routes reach this from the north and south having climbed the steep western side of the Conwy Valley. To the north the valley side is ascended by a public road zig-zagging up the slope, but this is not included in the study area. The northern access road runs from then road junction at SH 7575 6793 along an undulating high-level plateau about 290-270m OD. It descends to Pont Newydd, the bridge over the Afon Porthllwyd at SH7587 6715. The route then follows a track, originally constructed as the tramway taking men and materials to construct the Llyn Cowlyd dam. This track contours around the rocky spur of Penardda. Parting from the main track at SH7667 6647 the route descends by a recent field access track to cross the lower leat, traverse the sloping field below the leat and join with a track, largely surfaced in concrete that zig-zags down the steep slope adjacent to the Afon Ddu. This track runs through deciduous woodland that covers much of this part of the valley side to reach the road below at SH7739 6633.

The geology of the area is dominated by Ordovician slates, with contemporary and intrusive igneous formations (Roberts 1979). The steep escarpment of the Conwy valley is caused by an igneous formation. Boulder clay, containing pockets of peat, lines the hanging valleys. Peat also covers much of the uplands, whilst the floor of the valley is covered with alluvial deposits (Geological Survey of England and Wales, sheets 9 and 10).

The soils reflect the geological and climatic conditions, and are badly drained and acidic (Smith and George 1961). Land use, outside the industrial activities around Dolgarrog itself, is restricted to pasture and meadow in the flood plain, and rough grazing for sheep on the uplands, with woodland on the escarpment.

### **4.2 Archaeological and historical background**

The following is taken from Kenney 2011 (GAT report 928), but applies equally as background to the access routes.

#### **4.2.1. Earlier Prehistoric**

An Early Neolithic chambered tomb on the valley floor at Porthllwyd was badly damaged in the Dolgarrog dam disaster in 1925 (PRN 1544), and its site is now under the hydro-electric works. A worked flint flake (PRN 4615) was found close to this tomb, and a polished stone axe (PRN 4573) was found on the valley side adjacent to Afon Ddu. No other prehistoric sites are known within or immediately adjacent to the study area, although a large number are known from the wider area on the west side of the Conwy valley. Two Bronze Age ring cairns (PRNs 684 and 685) have been located close to the farmstead of Fachell and three other cairns with evidence of cists (PRN 3765, 5181 and 3779) are positioned in a line up the ridge from Bwlch Cowlyd to Pen Llithrig y Wrach, with PRN 3779 on the ridge. A standing stone (PRN 5280) is located next to the track along the south-eastern slope of Moel Elio, possibly indicating a Bronze Age route.

#### **4.2.2 Late Prehistoric / Romano-British**

The Iron Age hillfort of Pen y Gaer (PRN 663, Scheduled Ancient Monument number Cn023) is about 2km north-west of the study area and there is closer evidence of late prehistoric settlement. A large roundhouse settlement (PRN 705) on the north-western slopes of Moel Elio, possibly originated in the Iron Age, and is thought to have continued in use until the 3<sup>rd</sup> century AD. A number of isolated round huts on the upland pasture (PRN 3775 and 5622 in Cwm Eigiau; PRN 3766 on Bwlch Cowlyd) may have formed part of a transhumance system, which is also suggested by their presence close to later *hafotai*. It seems probable that there was cultivation within the study area in the Iron Age and Roman periods, but evidence of this is difficult to detect.

It is likely that the present road along the west side of the Conwy valley (B5106) follows the former Roman road (PRN 17,703) from the Roman fort at Caerhun to the fort at Bryn y Gefeiliau between Betws y Coed and Capel Curig (Davidson and Gwyn 1995, 4). The Roman fort at Caerhun lies about 2.5km north of the northern boundary of the study area.

#### **4.2.3 Medieval**

In a charter dated 1198 Llywelyn Fawr granted the lands of Ardda and Dar-las to the Cistercian monastery at Aberconwy, for use as a grange (Gresham 1939). However, Gresham doubts the date of the charter and believes that the land was not granted in full until the beginning of the 13<sup>th</sup> century (*ibid.*, 125). In 1284 Edward I transferred the monastery to a new site at Maenan, contiguous with the grange of Ardda and Dar-las. The boundary of this grange extended from Llyn Cowlyd along the ridge to the summit of Pen Llithrig y Wrach, descending a stream and joining the Afon Eigiau before crossing the end of Llyn Eigiau and heading towards the Afon Conwy (*ibid.*, 157-158). The boundaries of the township of Dolgarrog are co-terminus with this. To the north of the township of Dolgarrog lay the commote of Arllechwedd Isaf, extending from the left bank of the Conwy estuary to the confluence with the Afon Porthllwyd adjacent to the Ardda lands (Jones-Pierce 1944, 162). Dolgarrog was therefore presumably within the commote of Nant Conwy, although Carr places the commotal boundary further south and includes Dolgarrog in Arllechwedd Isaf (Carr 1977, 72).

Previously known medieval settlement and farming activity close to the study area seems to have concentrated in three main areas: in the area of Ardda (on the south side of Moel Eilio), within the far west end of Cwm Eigiau, and in the northern parts of Waun Bryn Gwenith. The most significant of these are the remains of the medieval township of Ardda, mentioned in a mid-15<sup>th</sup> century manuscript (*Bangor MS. 1939*). The settlement was occupied into the 18<sup>th</sup> century, but is now deserted (Jones-Pierce 1944). The surviving ruined buildings, consisting of single long huts, field walls, banks and enclosures are probably of the mid to later period of occupation of the site (RCAHMW 1956), although it is possible that some of the field boundaries and some of the buildings on the southern slopes of Penardda date from the period when this area was a monastic grange. However most of the evidence concerning these sites comes from the Tudor or 17<sup>th</sup> century era (Withers 1995). The likely socio-economic structure of the settlements is discussed by T. Jones-Pierce (1944).

A number of trackways cross the study area, including one that headed north-east past Pen Bryn Brwynog, along the ridge, and crossed the Afon Porthllwyd at Pont Newydd (Feature 61). This would have formed part of the early route across the uplands towards Capel Curig from Llanbedr (GAT 2001).

#### **4.2.4 Post-Medieval to Modern (1500-1850)**

The medieval land structure within the study area became fragmented partly because of the Welsh law of partible inheritance. This ended in 1535 with the first of the Acts of Union, which also allowed for easier buying and selling of land. Large estates were built up by purchase and marriage during the next three centuries, resulting in dominant landowning families such as the Bulkeley's of Baron Hill, Wynne's of Glynllifon and Wynn's of Gwydir. The growth of the threefold social structure of landowner / tenant / labourer eased the transition from feudalism to capitalism, and encouraged the assimilation of small parcels of land into rentable farms (Longley 2006, 61-82).

The farms on the uplands consisted of scattered medium sized holdings which were generally established on the slopes of the hill, making use of the lands both on the river meadow and on the upland pastures (Butler 1981, 34). This characteristic pattern of settlement has been shown to have evolved from the late Middle Ages and in the century or so after 1500 when the settlement patterns of earlier agrarian systems decayed, to be replaced by consolidated farmsteads. Encroachments on the waste and on common land were prompted by population pressure and legal and social changes associated with Wales incorporation into the English state following the Acts of Union of 1536-1542. Survival of enclosures and associated small paddocks around the farmsteads, probably dating from the sixteenth century, have been identified just to the north of the study area

in Caerhun and Llanbedr y Cennin parishes (Withers 1995), and similar field patterns are apparent here. These suggest scattered islands of settlement, each with a contiguous scatter of small fields, with the holdings marked out clearly, which can be seen on maps from 1777 onwards at Ffridd Eithinog (*ibid.*, 43). This pattern is particularly apparent around Pont Newydd and Ffridd Ddu farmsteads within the study area. The relict walls are sometimes associated with long huts (Hooke, 1997, 94), and two have been identified within the study area (Features 13 and 36), with a small farmstead also identified (feature 94). Excavation of similar sites has suggested a variety of structural types and for evidence of internal sub-divisions, with very shallow foundations (Smith and Thompson 2006, 128-132). The long huts identified within the study area are all aligned along the hill slope, rather than perpendicular to it as is typical for medieval long huts, and they lack the bank of a drainage hood. Excavation would be necessary to date these structures but the visible remains are more consistent with early post medieval rather than medieval buildings. It is likely that much of the earlier field system and farms within the study area date from the 16<sup>th</sup> century, although some may have developed in the 15<sup>th</sup> century. However it is possible that some of the long huts that did not develop into 19<sup>th</sup> century farms have an earlier date.

The field boundaries, which survive as 'wandering walls', survive amongst the more regular field systems created by the mid 19<sup>th</sup> century Parliamentary Enclosures (Davies 1979, 42-44). An upland survey of Eastern Snowdonia, carried out by *Cambrian Archaeological Projects* (CAP) identified a number of sites of this date both within the study and the wider area (Jones 2003).

Place and field names can be useful in tracking the history of settlement and land-use. Tithe maps normally give field names but those for Dolgarrog and Caerhun (figures 4 and 5) just indicate the limits of farmsteads within the study area. However estate maps from the 1780s (figures 2 and 3) give a more detailed plan of the field boundaries along parts of the route. The map evidence suggests that some fields were used for arable cultivation but some field names also refer to cattle and meadow land indicated alongside the rivers would have been valued. The 'coed' (woodland) names of some of the farmsteads do suggest that the area was not cleared until after the medieval period, and Ffridd Ddu implies the enclosure of common or upland, but 'ffridd' can sometimes also suggest woodland (Hooke 89-90).

Land on the north side of the Afon Porthllwyd lay within the parish of Caerhun, while the township of Ardda and Dar Lâs (later Dolgarrog) created from the monastic grange at the Dissolution, was within the parish of Llanbedr y Cennin, although separated from the rest of that parish. The meadows on the floor of the Conwy valley, as far as the site of the old Abbey on the eastern side of the river, were extra-parochial, and south of the Afon Ddu were the united parishes of Trefriw and Llanrychwyn. The lands of the Abbey and a large part of Dolgarrog township were owned by Lord Newborough of Glynllifon, and formed one of the dispersed holdings of his former estates. The land to the north-west, within the extensive parish of Caerhun formed part of the Gwydir estate (Jones and Gwyn 1989, 21).

Use was made of the Afon Ddu as a source of water to power mills. It has been suggested that a *pandy* (fulling mill) located at SH 77416630 dates from the monastic period at Dolgarrog, although the first reference to this is in 1575 (Jack 1981, 88). The mill became the property of the Glynllifon estate and is recorded in the Glynllifon archive (Gwynedd Archives, Caernarfon) between 1787 and the break-up of the estate in the mid 20<sup>th</sup> century. A painting of this mill by William Muller hangs in the Williamson Art Gallery, Birkenhead. It was replaced by a woollen factory in c.1803 (Gwyn 2006, 121), and there was also a saw mill on the site (Jones and Gwyn 1989, 23, 24). On the Afon Porthllwyd there was a small water mill to grind corn (*ibid.* 24). The fulling mill is shown on a 1788 estate map (figure 6) and on the tithe map (figure 4).

The current B5106 road, running down the west side of the Conwy valley was turnpiked in 1777, which may be when the present Dolgarrog Bridge was built.

#### **4.2.5 Modern (1850 to present)**

The industrial history of Dolgarrog is eloquently told by Eric Jones and David Gwyn in their 1989 book *Dolgarrog-An Industrial History*, from which much of the following information has been gleaned.

Small scale industrialisation started in the early 19<sup>th</sup> century when an iron sulphide mine and other small slate quarries were established in the neighbouring side valleys. Lead was mined on the land of Coedty Bach, ochre and sulphur on Coedty Mawr and Coed Sadwrn, although these were small and short-lived mines (Gwyn and Nevell 2006, 7). Small slate quarries were opened at Cedryn and Cwm Eigiau and worked between 1825 and 1873. Between 1861 and 1866 a tramway was built to join these with a wharf on the Conwy (Jones and Gwyn 1989, 22). The tramway did not last long, but it was reused for many subsequent developments. In particular

the incline that took the tramway down the steep escarpment of the valley side proved useful for access to the uplands throughout the 20<sup>th</sup> century.

The water of this area was first collected to supply Llandudno with drinking water. Between 1878 and 1881 a dam was built at Dulynd and between 1891 and 1897 another dam was built at Llyn Cowlyd. The water from this dam was carried down to the valley floor in a cast iron pipe running next to the Afon Ddu. However the steep fall from the hanging valleys made the area particularly suitable for generating hydro-electric power; a power source being experimented with in North Wales from the late 1870s (Gwyn 2006, 142). Land above Dolgarrog was bought in the 1890s with the aim of developing hydro-electricity but little happened on the ground until 1907 when an aluminium extraction and smelting plant was established at Dolgarrog and the lakes and rivers were harnessed to supply water for a hydro-electric station to power the works (Jones and Gwyn 1989).

Work on a dam at Llyn Eigiau and related leats and pipelines started in May 1908, reusing the slate tramway to create a railway to bring men and materials to the works. By 1911 the work was complete and the aluminium works were powered by a hydro-electricity station which derived its water from Llyn Eigiau and the Afon Ddu. The water catchment works took a large amount of labour and up to 400 men lived in a shanty town, probably located within the study area near Coedty Mawr. This had a chapel and several grocery shops (Jones and Gwyn 1989, 39).

Part of the railway was reused in 1916 and extended to Llyn Cowlyd, when the dam here was rebuilt. This tramway continued in operation for about fifty years, and has left small sidings with corrugated iron sheds within the study area (Jones and Gwyn 1989, 178-183).

The aluminium works expanded during and after the First World War creating a need for housing, and resulting in the growth of Dolgarrog village. A new dam at Coedty and associated pipes were constructed in 1923 to 1924, but in 1925 a breach occurred in a badly built section of the Llyn Eigiau dam. The resulting flood water overwhelmed the new Coedty dam and caused it to collapse suddenly releasing a vast quantity of water that caused a devastating flood in the village below. The flood resulted in the deaths of sixteen people in Dolgarrog, partly destroyed the Porth Llwyd Neolithic chambered tomb and damaged the new pipework as well as the dam (Jones and Gwyn 1989, 113-125). However, the Coedty dam and pipes were rebuilt by 1927 (Jones and Gwyn 1989, 123).

In the 1950s another leat was added to the water catchment system, the design of which benefited from the Colwyn Bay based architect Sidney Colwyn Foulkes, whose design works also included the Tafolog Weir, to the north of the study area. A map produced in advance of improvement works at the Power Station, shows the access routes and compounds of that period (Figure 7). Colwyn Foulkes was a local architect, who achieved a national reputation for the design of hospitals, cinemas and housing estates. His work as landscape consultant on the Dolgarrog project earned the scheme a Civic Trust Award (Conwy Archive Service 2008).

### **4.3 Statutory and non-statutory designations**

The study area lies within the Lower Conwy Valley Landscape of Outstanding Historic Interest in Wales (Ref: HLW (Gw) 4) (Cadw/ICOMOS 1998), which is described as a *topographically diverse landscape straddling the lower Conwy valley and adjacent uplands on the north eastern flanks of the Carneddau ridge in north Snowdonia, containing extensive and well-preserved relict evidence of land use, communications and defence from the prehistoric period onwards. The area includes: Neolithic chambered tombs; Bronze Age funerary and ritual monuments; Iron Age hillforts, settlements and field systems; a Roman fort and road; medieval motte, settlements and field systems; Parliamentary Enclosures; an early hydro-electric power station and aluminium works.*

The Coed Dolgarrog (2018) Historic Landscape Character Area (HLCA) is defined on its western side by the track running along the Llyn Cowlyd tramway, so the railway incline and the water board trackway lie within this area. This is described as an area of ancient woodland with water management features. The rest of the route is in or on the edge of the Enclosed Uplands HLCA (2008), which is an area rich in archaeological sites, with large enclosures and traces of early industrial exploitation (GAT 1999, 30-31).

The boundary of the Snowdonia National Park largely runs along the northern part of the access route and down the railway incline (PRN 16322). The entire southern route is within the National Park, including where

it passes through the medieval township of Ardda. There are no Scheduled Ancient Monuments within the study area and the only listed building is Pont Dolgarrog on the road through Dolgarrog (grade II listed building refs 3183 and 16952).

#### **4.4 The Archaeological Survey**

Fifty nine features have been identified on or close to the line of the access routes and compounds. Many of these have already been listed in the previous assessment (GAT report 928) but they are included here as the impacts in some cases have changed and to highlight features potentially at risk specifically from work on the access routes. Two of these features are shown on figure 1 but the rest are on figures 8 to 10. All the features listed are identified by a PRN (Primary Record Number) for the Gwynedd HER. New features identified in this assessment have been allocated new PRNs by the HER. The features are briefly described in the gazetteer forming Appendix 3 with recommendations for further assessment and mitigatory measures, where appropriate. The recommendations are summarised in section 6 below. The recommendations are based on current proposals for work and any changes to the proposals may require changes to the recommendations below to be changed also.

Sites have been given a category of importance (see Appendix 2) by considering them as part of their contemporary landscape. This means that field boundaries associated with early farm sites have been given the same importance category as the farm buildings (mostly category B). Obviously the destruction of a small section of a field boundary is of less significance than the destruction of the farmstead, but it is important to see features as part of a landscape rather than isolated elements. The whole water catchment system has been categorised as level B importance, because it is part of an industrial landscape including an early hydro-electric plant and the aluminium works that is clearly of regional importance. The earliest part of this system, i.e. that dating from before 1914, is of national importance and has been categorised as A.

A 'C' after the grid reference indicates that the reference is for the centre of the feature or field system, and 'A' after the grid reference indicates the general area of the feature, which may however extend over a wider area.

In the text in the gazetteer the maps referred to are as follows:

1780s map: Holland Estate map of land in Dolgarrog Parish, Bangor Ms 2383, 1780s (figure 2)

1788 map: Lord Newborough's Estate maps, MSS maps volume 96, National Library of Wales (Figures 3 and 6)

1816-1824 map: Ordnance Survey preparatory map, MSS f34081, Bangor University Archives

1889 map: Ordnance Survey 25 inch 1st edition map of 1889, Caernarvonshire sheets XIII.7 and XIII.8

1900 map: Ordnance Survey 25 inch 2nd edition map of 1900, Caernarvonshire sheets XIII.7 and XIII.8

1913 map: Ordnance Survey 25 inch 3rd edition map of 1913, Caernarvonshire sheets XIII.7 and XIII.8

1950s map: Colwyn Foulkes Collection C/Maps 21/2/11/1/2, Conwy Archives (Figure 7)

## **5. SUMMARY OF ARCHAEOLOGICAL POTENTIAL**

### **5.1 Summary of sites found in the archaeological survey**

The road along which the proposed northern access route runs is possibly of medieval origin (PRN 31936) but there is nothing to suggest that the existing field walls (PRN 32145, plate 6) date from before the early 19<sup>th</sup> century when they appear on the tithe map. Possible field terraces (PRN 32144) to the east of the road may indicate the presence of a much earlier field system buried under the later one. The leat (PRN 31894) carrying water into Coedty Reservoir from the north cuts through the fields. It was constructed in 1955-58 (Jones and Gwyn 1989, 185) and designed by the architect, Sidney Colwyn Foulkes, a significant figure in landscape design in the post-War years, and who won an award for part of the scheme above Rowen (Conwy Archives CD7/2/6/22).

Once the route has left the road it follows the low level leat (PRN 31939) carrying water in the reservoir from the Afon Ddu. This was completed by 1925. The track next to the leat reused part of a tramway (PRN 31931) originally built to service mines in Cwm Eigiau and further east and south follows the Llyn Cowlyd tramway (PRN 31953). The former tramway was originally constructed in the 1860s and converted into a railway in 1907 to supply the construction of the Llyn Eigiau dam. The tramway was accessed by a steep incline (PRN

16322, plate 5) that was used at least until the 1950s. The Llyn Cowlyd tramway (PRN 31953) was built in 1916/1917 for construction of the Llyn Cowlyd dam.

These features cut through the earlier landscape, which in the valley of the Afon Porthllwyd probably dates back to the 16<sup>th</sup> century, but to the south of the prominent spur of Penardda the field systems probably had a much earlier origin. In the area of the Ardda township (PRN 676) the main walls and some dwellings are shown as in use in the 1780s but the quantity of earthworks in this area shows a more complex field system that probably pre-dates the 18<sup>th</sup> century by a significant period (plates 1 to 3, 9 to 14). The parish of Dolgarrog seems to have formed from the monastic grange attached to the Abbey of Maenan in Conwy Valley. It is probable that the Ardda settlement dates from this period (the 13<sup>th</sup> to early 16<sup>th</sup> centuries) and this area may have formed the main settlement in the grange.

The original access to this settlement was up the valley side escarpment (PRN 32163) close to the existing concrete water board track (PRN 12975, plate 4) and the woodland which this track passed through would certainly have been exploited in the medieval period. Inclines (PRN 32164, plate 15) and other features relating to 19<sup>th</sup> century mining activity can be found in this woodland and there was a fulling mill (PRN 3861) at the base of the escarpment on the Afon Ddu that may have had a medieval predecessor.

## **5.2 Location, Summary and Setting**

The access routes run along the upland plateau to the west of Dolgarrog, Conwy and down the steep escarpment (Figure 1). The area consists of dispersed settlement on mid slope terraces above the river valleys. The importance of this landscape is demonstrated by part of it being within the Snowdonia National Park and all of it being included within an area of outstanding historical interest as defined by Cadw (Cadw/ICOMOS 1998).

The alterations proposed to the access routes are relatively slight. If significant lengths of wall along the northern access road are demolished and the road widened it will have an impact on the character of the landscape. However if the walls are rebuilt in the same style only the change in the road width will have a long term impact on the appearance of the landscape. The southern access route is largely screened by woodland so the long distance impact will be less. Only small changes to this route are proposed. Where the route leaves the woodland on to open farmland there is more risk of impact. This route is to be used only twice for the large machines to reach the main works and then to leave at the end of the works. A dry day will be chosen for this and the machines will drive over the grass in the field to the east of Tai-Isaf-Ardda with no groundworks necessary. This should result in minimal impact on the landscape. The same applies if the route across the hill above the leat tunnel is chosen for use.

The most sensitive part of the route is reached after crossing the leat. Here the existing field track will be used to reach the Llyn Cowlyd tramway track, however the track cuts across a slope and this will have to be widened to allow large machines to traverse it safely. The widening of this track will have a significant visual impact both from the opposite side of the valley and from closer proximity, particularly from a public footpath which crosses the area.

## **5.3 Environmental Remains and Soil Morphology**

The peats of the uplands have a high potential for preserving a good pollen record, especially those in small bogs near farmsteads. However, the proposed works will not damage any peat bogs or affect the drainage regime of the area beyond that currently done by the Hydro-Electric works, so it will have no impact on this preserved record. Relict soils might be preserved under the field walls within the Ardda township and these might be revealed by the widening of the field track.

## **5.4 Artefactual Potential**

The potential for the survival of prehistoric artefacts is unknown. However finds found in association with medieval upland settlement is usually very limited in Wales. As no large areas are to be stripped for the access routes the chance of finding artefacts is small.

## 6. SUMMARY OF RECOMMENDATIONS

The following table summarises the recommendations given for each site listed in appendix 4.

PRN	Site name	Importance	Impact	Recommendation for further assessment	Mitigation recommendations
676	Ardda, Medieval Township	A	Slight	Topographic survey	Detailed recording of sections across features
679	Cottage, Ardda	A	Unlikely	Topographic survey	Avoid
680	Long Hut, Ardda	A	None	None	Avoid
3861	Site of Fulling Mill, Ardda	A	None	None	Avoid
11690	Pont Dolgarrog	A	None	None	Avoid
12955	Coed Sadwrn Cottage	B	None	None	Avoidance
12956	Tai Isaf Ardda	A	None	None	Avoidance
12957	Cottage & Enclosure	A	Slight	Topographic survey	Detailed recording of sections across features
12962	Track to Ardda	B	Unlikely	Topographic survey	None
12968	Building	B	Unlikely	None	Avoid
12974	Pont Newydd Bridge	E	Unlikely	None	Avoidance
12975	Concrete road	D	Unlikely	None	Watching brief
15821	Coed Dolgarrog, Landscape	B	Unlikely	None	Avoid
16195	Pipeline, Dolgarrog Hydro-electric Plant	B	Unlikely	None	Avoidance
16321	Dolgarrog Hydro-electric Plant	B	None	None	None
16322	Incline, Ardda	A	None	None	Detailed recording and topographic survey, watching brief
16323	Relict wall, Ardda	C	Likely	None	Avoid
16330	Iron Gate, Site of, Ardda	D	Likely	None	None
31893	Coed Sadwrn Track	B	Unlikely	None	Avoid
31894	Llyn Coedty Leat	B	Unlikely	None	Avoid
31895	Pont Newydd Cottage	B	None	None	Avoidance
31896	Pont Newydd Structure I	C	None	None	Avoidance
31897	Modern bridge	D	Likely	None	Basic recording
31907	Pipe	B	Unlikely	None	None
31917	Possible ridge and furrow cultivation, and other features in proposed compound field	D	Slight	None	None
31925	Trackway	C	Considerable	None	The track is to be improved for access. Original features such as rock cut sections should be left intact or recorded in detail. Basic recording should be carried out prior to the works.
31927	Field boundary wall	B	None	None	Avoidance
31928	Former drum house and Coed Sadwrn railway yard	B	Considerable	None	This area may be impacted on considerably if the surge pipe is installed up the railway incline, and

					should be included in the detailed recording in advance of the works.
<b>31931</b>	Tramway to Cwm Eigiau	A	Considerable	None	The track running along the route of the tramway is to be improved as part of the current works. Basic recording should be carried out before this occurs.
<b>31934</b>	Incline and water pipe	A	Considerable	None	It is proposed to replace the surge pipe in a new location. If the existing pipe is to be removed and the incline disturbed this should be preceded by detailed recording including a topographic survey.
<b>31936</b>	Route to Llyn Cowlyd	B	Likely	None	None
<b>31939</b>	Low Level Leat	B	None	None	Avoidance
<b>31952</b>	Former locomotive shed	B	Unlikely	None	The tramway is to be improved and care should be taken not to damage the shed or remains of the siding. Basic recording should be carried out and the area should be fenced and avoided.
<b>31953</b>	Llyn Cowlyd tramway	B	Significant	None	This route is to be improved and care should be taken not to disguise its character as a tramway by groundworks or dumping over the embankments. Original features such as rock cut sections should be left intact or recorded in detail.
<b>31957</b>	Field wall	E	Significant	If the road needs to be widened here survey and evaluation trenches are recommended to investigate the date and nature of the boundary.	Dependant on results of further assessment
<b>31971</b>	Field wall	B	None	None	Avoidance
<b>31972</b>	Corner of possible field terrace	B	Likely	None	Avoid
<b>31976</b>	Trackway leading to road from Pont Newydd Farm	C	Unlikely	None	Avoid
<b>32144</b>	Pant-Y-Meurig Terraced Fields	E	None	None	Avoid
<b>32145</b>	Boundaries to road	C	Considerable	None	Detailed recording and watching brief
<b>32146</b>	Possible clearance cairn	E	Unlikely	None	Avoid
<b>32147</b>	Pen Ardda Tunnel	B	None	None	Avoid

<b>32148</b>	Gallt Y Rhiw Stone	E	Unlikely	None	Avoid
<b>32149</b>	Gallt Y Rhiw trackway	D	Considerable	None	None
<b>32150</b>	Ardda cultivation ridges	A	Unlikely	None	Avoid, do not dump material over this area
<b>32151</b>	Possible building platform	A	None	Include in any topographic survey	Avoid.
<b>32152</b>	Ardda enclosure II	C	Unlikely	None	Avoid
<b>32153</b>	Footpath	D	Unlikely	None	None
<b>32154</b>	Tai-Isaf-Ardda enclosure	B	Unlikely	This should be included in the topographic survey	Detailed recording of sections across features
<b>32155</b>	Ardda field bank V	B	Unlikely	None	Avoid
<b>32156</b>	Ardda cultivation ridges III	B	Unlikely	None	Avoid
<b>32157</b>	Footpath	D	Unlikely	None	None
<b>32158</b>	Building platform	A	Unlikely	Topographical survey	Avoid
<b>32159</b>	Building platform	A	Unlikely	Topographical survey	Avoid
<b>32160</b>	Scarp/field boundary	E	Slight	Topographical survey	Cross on a dry day to minimise damage by vehicle ruts
<b>32161</b>	Ditch/field boundary/track	C	Slight	Topographical survey	Cross on a dry day to minimise damage by vehicle ruts
<b>32162</b>	Ditch/field boundary	E	Slight	Topographical survey	Cross on a dry day to minimise damage by vehicle ruts
<b>32163</b>	Part of Track to Ardda	E	Unlikely	None	Avoid
<b>32164</b>	Incline	D	None	None	The incline runs very close to one sharp bend in the concrete road but it is recommended that if the road is widened here that the incline is avoided.

## 7. GENERAL RECOMMENDATIONS

### 7.1 Access routes

If the northern route along the public road is used the road side walls and revetments, mainly along the eastern side of the road would have to be demolished and the road widened. Detailed recording would be recommended before this took place. An archaeological watching brief is recommended to record any detail of wall structure revealed during dismantlement and to identify and record any features exposed as the road is widened. The walls and revetments should be rebuilt in the same style to minimise the long term impact on the character of the landscape.

However there is an alternative route below the embankment of the leat. This has not been inspected on the ground for this report as access was not possible but it is possible that the use of this route would reduce impact on the landscape and possible loss of pre-18<sup>th</sup> century archaeology. The running track would be built up where necessary and would not be terraced into the slope as this would risk the stability of the leat embankment. No buried archaeology should therefore be disturbed by this alternative.

Where the access route runs on the former tramways by the low level leat there is likely to be minimal modification. Where original rock cuttings need to be widened these should be recorded first and structures by

the track should be avoided. If the route over the hill above the leat tunnel is used this should cause little impact. No specific features were identified on this route, although there was considerable bracken cover. The intention is not to carry out any groundworks on this route, but an archaeologist should be available in case this proves necessary and in case the removal of vegetation exposes any hidden archaeological features.

The proposed use of the track which crosses the settlement remains at Ardda has the greatest potential for impact on archaeological remains. This track will have to be widened on the upslope side by one or two metres. The spoil will not be cast down the slope but will be removed to a location at one end of the track. The proposed dumping area needs to be assessed for archaeological potential prior to the start of work to ensure no significant archaeological remains are buried. It is recommended that a topographic survey of this area be carried out prior to the start of improvements. This will give a context for specific features that might be impacted by the widening of the track. The survey should cover an area sufficient to allow the trackside features to be understood in the wider landscape. The widening of the track should be monitored continually by an archaeologist and any sections through features should be recorded in detail. Any buried soils so revealed should be sampled for study.

The topographic study should include the field east of Tai-Isaf-Ardda to record the earthworks in case of accidental damage. However the proposal is for large plant to cross this field only twice, on their way into and out from the main works. The crossing will be done on dry days to ensure minimal rutting of the field. It is recommended that the vehicles keep close to the western wall of the field to avoid the building platforms identified in the field walkover. The leat will be crossed on a temporary bridge that will be removed after use.

Any widening of the concrete water board track necessary should be monitored and recorded by an archaeologist and features noted in the recommendations list and in appendix 4 should be avoided.

## **7.2 Compounds**

It is recommended that compound 5 be moved to the new proposed location just below the leat and adjacent to the road (SH7578 6725). This field (PRN 31917) was previously suggested as having ridge and furrow but a close inspection showed that the shallow narrow furrows were actually caused by vehicle tracks during the cutting of rushes. An earthwork just below the leat embankment is related to a field access track and is recent and a drain in the field is probably also fairly recent. The only known potential archaeology in the field is a possible cairn (PRN 32146) towards the south-western boundary. This is completely overgrown with no stones showing but its very circular shape suggests a cairn. A secure identification cannot be made without excavation but it is recommended that this is simply avoided as the whole field is unlikely to be needed for the compound. It will be necessary for an archaeologist to locate this feature and ensure it is fenced off as it is not easy to recognise.

Compound 2 would be more convenient next to one of the existing access tracks. There is a track just north of the railway incline (PRN 16322) (see figure 9). Before this descends the escarpment it is fairly level and there is flat ground either side of it. This area was used for a small compound during the ground investigation. It was not possible to closely inspect all the area during the field walkover as much of it is covered by bracken but no features have been noted in this area on previous occasions.

## **7.3 Railway incline**

The replacement of the surge pipe along its present route does not seem to be possible due to critical engineering issues so the use of the railway incline (PRN 16322) to support a new surge pipe has been proposed. This would remove the necessity to build a new ramp in this area up to the level of the leat but would have a very significant impact on the incline which has played a prominent part in the industrial history of the area and is a significant feature within the landscape. The proposals would involve the pipe being buried within the cutting of the incline. On the stone ramp the pipe would be set into the stone structure and covered over. The covering has to be sufficient to prevent the pipe coming loose under the pressure of a surge. This proposal would cause the cutting to become largely invisible and the stone ramp to be largely demolished and rebuilt. It seems unlikely that the core of the ramp is of earth as stone can be seen across its full width. It therefore seems unlikely that a trench could be dug up the ramp for the pipe, especially as the pipe would be 1.2m in diameter and much of the ramp is only 3.4m wide. If this work is undertaken detailed recording and a topographic survey is recommended before the incline is disturbed with a watching brief would be required during the

dismantlement of the ramp. The survey and watching brief would need to include the sidings at the top of the ramp. It is recommended that the ramp be rebuilt in the same style so that it remains a feature within the landscape.

## 8. CONCLUSIONS

In general the access routes proposed are likely to cause minimal impact on the archaeology of the area as long as the recommendations above are followed and known archaeological sites avoided. There is a significant risk of damage to the archaeology within the Ardda township area and it is therefore recommended that a topographic archaeological survey be undertaken so that the nature and status of the features is better understood, and appropriate mitigation can be identified.

The new compound locations will reduce the potential impact inherent in the previous locations.

The use of the former railway incline for the new surge pipe will largely obscure and disturb the *in situ* remains but will have minimal long term impact on the landscape and may be the preferred option considering a new surge pipe in this approximate location is unavoidable.

All recommendations and mitigation proposals will need to be discussed with and confirmed by SNPA and the SNPA archaeologist before the start of work.

## 9. ARCHIVE

The archive consists of historic maps, plans and aerial photographs, along with notes and digital images taken on the field visit. The archive is currently held by GAT under project code **G2158**

## 10. REFERENCES AND OTHER SOURCES CONSULTED

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 Ordnance Survey preparatory drawings by Robert Dawson, MSS f34081, 1816-1824
- Gwynedd Archives, Caernarfon**  
 GAS XD2/8356-7 *Plans and Schedule of Lord Newborough's Estates c.1815*
- GAT Historic Environment Record**  
 Ordnance Survey 25 inch 1st edition map of 1889, Caernarvonshire sheets XIII.7 and XIII.8  
 Ordnance Survey 25 inch 2nd edition map of 1900, Caernarvonshire sheets XIII.7 and XIII.8  
 Ordnance Survey 25 inch 3rd edition map of 1913, Caernarvonshire sheets XIII.7 and XIII.8

***National Library of Wales***

Sale catalogue of Dolgarrog Estate, Caernarvonshire 357, 1896

Survey of the Menai and Abbey Estates, in the county of Denbigh, Ardda in the county of Carnarvon, also Festiniog and Landecwin in the county of Merioneth. Property of the Right Honourable Thomas Lord Newborough, MSS maps volume 96, 1788

***Air Photography Unit, Cardiff***

Library No	Sortie	Date	Organisation	Frame number
4613	3G TUD UK 34	16/01/1946	RAF	5263 and 5376
7181	OS 71 284	04/06/1971	OS	189

## APPENDIX 1: Sites previously listed on Gwynedd HER and National Monument Register

Table of sites near the access routes previously listed in the Gwynedd HER  
 For sites identified in previous assessments for this project see GAT report 928

PRN	NAME	FORM	NGR	Type	PERIOD
676	Ardda, Medieval Township	Multiple	SH76506614	Settlement	Medieval
679	Cottage, Ardda	Building - Ruined	SH76406601	House	Medieval
680	Long Hut, Ardda	Building - Ruined	SH76656616	Long hut	Medieval
681	Long Hut, Ardda	Building - Ruined	SH76456632	Long hut	Medieval
682	Long Huts, Ardda	Building - Ruined	SH76366593	Deserted rural settlement	Medieval
3861	Site of Fulling Mill, Ardda	Document	SH77306630	Fulling mill	Medieval
4573	Stone Axe, Findspot, Dolgarrog	Find Only	SH77006600	Findspot	Prehistoric
6147	Rectangular Building/Enclosure, Ardda	Building - Ruined	SH76506647	Enclosure	Post-Medieval
6148	Platform House, Ardda	Building - Ruined	SH76556648	House platform	Medieval
7517	Long Hut, Ardda		SH76366593	Long hut	Medieval
11690	Pont Dolgarrog, over Afon Ddu		SH77456630	Bridge	Post-Medieval
12955	Coed Sadwrn Cottage	Building - Ruined	SH76126707	Cottage	Post-Medieval
12956	Tai Isaf Ardda		SH76556597	Farm	Post-Medieval
12957	Cottage & Enclosure	Multiple	SH76506614	Cottage	Post-Medieval
12962	Track to Ardda	Document	SH76806611	Trackway	Medieval
12968	Building		SH76616614	Building	Post-Medieval
12974	Pont Newydd Bridge	Document	SH75876715	Bridge	Post-Medieval
12975	Path (Part of Track to Ardda)	Document	SH77216619	Path	Medieval
12986	Ty'n y Garreg Ddu Farmhouse	Document	SH77326642	Farmhouse	Post-Medieval
12990	Track to Coed Sadwrn	Earthwork	SH75876715	Trackway	Post-Medieval
15821	Coed Dolgarrog, Landscape		SH76706690	Landscape	Multi-period
16195	Pipelines, Dolgarrog Hydro-Electric Plant	Other Structure	SH7651767134	Pipeline	Modern
16227	Drumhouse, Ardda	Other Structure	SH7704366280	Winder house	Post-Medieval
16228	Incline, Ardda	Other Structure	SH7712966287	Inclined plane	Post-Medieval
16321	Dolgarrog Hydro-Electric Plant	Building - Roofed	SH7655167184	Power station	Modern
16322	Incline, Ardda	Earthwork	SH7650167162	Inclined plane	Post-Medieval
16323	Relict Wall, Ardda	Other Structure	SH7649367153	Wall	Medieval
16324	Terraces, Ardda	Earthwork	SH7650767145	Terraced ground	Medieval
16325	Long Hut, Possible, Ardda	Other Structure	SH7647767094	Long hut	Medieval
16327	Coppice, Ardda	Landscape	SH7651867014	Coppice	Post-Medieval
16330	Iron Gate, Site of, Ardda	Other Structure	SH7674366636	Gate	Post-Medieval

PRN	NAME	FORM	NGR	Type	PERIOD
16333	Trial Cut, Ardda	Other Structure	SH7685066266	Trial mine	Post-Medieval
16336	Coppice Woodland, Ardda	Landscape	SH7694266040	Coppice	Unknown
16337	Relict Walls, Ardda	Other Structure	SH7695766097	Wall	Unknown
16338	Long Hut, Possible, Ardda	Other Structure	SH7699666135	Long hut	Medieval
16340	Terraces, Walls & Tracks, Ty'n y Gerddi, Ardda	Multiple	SH7725966425	Field system	Post-Medieval
16342	Relict Building & Terraces, Ardda	Multiple	SH7731166348	Building	Post-Medieval

Table of sites near the access routes previously listed in the National Monument Register

NPRN	NAME	NGR	BROADCLASS	TYPE	PERIOD
23789	PONT DOLGARROG, OVER AFON DDU	SH77456630	Transport	BRIDGE	Post Medieval?
26320	COTTAGE ARDDA; TAI-ISAF ARDDA, COTTAGE AND ENCLOSURE	SH76506614	Domestic	COTTAGE	Post Medieval?
43777	ST MARYS CHURCH	SH7667	Religious, Ritual and Funerary	CHURCH	Medieval
43786	ST MARY'S CHURCH	SH774663	Religious, Ritual and Funerary	CHURCH	Post Medieval
276378	BONT NEWYDD FARMHOUSE	SH75666722	Domestic	FARMHOUSE	Post Medieval
276379	PONT NEWYDD STRUCTURE I	SH75826720	Domestic	BUILDING	Post Medieval
276383	COED DOLGARROG WELL	SH76366686	Water Supply and Drainage	WELL	Unknown
276384	PEN ARDDA TUNNEL	SH76676665	Transport	TUNNEL	Post Medieval
276387	TAI-ISAF ARDDA FARMSTEAD	SH76556597	Agriculture and Subsistence	FARMSTEAD	Medieval?
276388	ARDDA LONG HUTS	SH76426598	Domestic	DESERTED RURAL SETTLEMENT	Medieval
276491	PONT NEWYDD COTTAGE	SH75806715	Domestic	FARMHOUSE	Post Medieval
276492	PONT NEWYDD STRUCTURE II	SH75756706	Agriculture and Subsistence	FIELD BARN	Post Medieval
276535	GALLT YRHIW STONE	SH76716650	Unassigned	STONE	Post Medieval
276536	GALLT Y RHIW PLATFORM	SH76616643	Unassigned	PLATFORM	Medieval?
276540	ALLT Y RHIW PIT	SH76606642	Unassigned	PIT	Unknown
276552	TAI-ISAF ARDDA BUILDING	SH76616614	Agriculture and Subsistence	BUILDING	Medieval
276553	ARDDA LONG HUT III	SH76646616	Domestic	LONG HUT	Medieval
276554	ARDDA ENCLOSURE II	SH76586619	Unassigned	ENCLOSURE	Medieval?
276556	ARDDA FIELD BANK II	SH76436616	Agriculture and Subsistence	BANK	Medieval
276557	TAI-ISAF ARDDA DITCH	SH76726616	Unassigned	DITCH	Unknown

<b>NPRN</b>	<b>NAME</b>	<b>NGR</b>	<b>BROADCLASS</b>	<b>TYPE</b>	<b>PERIOD</b>
276558	ARDDA FIELD BANK III	SH76836620	Agriculture and Subsistence	BANK	Medieval
276559	ARDDA CULTIVATION RIDGES I	SH76726622	Agriculture and Subsistence	RIDGE AND FURROW	Medieval
276560	ARDDA ENCLOSURE III	SH76716630	Agriculture and Subsistence	ENCLOSURE	Medieval?
276561	ARDDA FIELD BANK IV	SH76776631	Agriculture and Subsistence	BANK	Medieval
276562	GALLT Y RHIW TRACKWAY	SH76666640	Transport	TRACKWAY	Medieval?
276563	ARDDA CULTIVATION RIDGES II	SH76526636	Agriculture and Subsistence	RIDGE AND FURROW	Medieval
276564	GALLT Y RHIW ENCLOSURE	SH76586652	Unassigned	ENCLOSURE	Unknown
276831	ARDDA COTTAGE I	SH76416602	Domestic	HOUSE	Medieval?
276835	ARDDA TRACK	SH76806612	Transport	TRACKWAY	Medieval?
276870	TAI ISAF ARDDA OUT-BUILDING	SH76536597	Agriculture and Subsistence	BUILDING	Post Medieval
276871	TAI-ISAF ARDDA	SH76566596	Agriculture and Subsistence	BUILDING	Post Medieval
276873	ARDDA LONG HUT II	SH76366593	Domestic	LONG HUT	Medieval?
276875	TAI-ISAF-ARDDA ENCLOSURE	SH76466609	Unassigned	ENCLOSURE	Post Medieval
276876	ARDDA CULTIVATION RIDGES III	SH76626606	Agriculture and Subsistence	RIDGE AND FURROW	Medieval
276879	ARDDA CULTIVATION RIDGES VI	SH76556621	Agriculture and Subsistence	RIDGE AND FURROW	Medieval
276883	ARDDA CULTIVATION RIDGES X	SH76676632	Agriculture and Subsistence	RIDGE AND FURROW	Medieval
276888	HAFOD (REMS. OF), ABOVE COED SADWRN	SH76256697	Domestic	HAFOD	Medieval
276889	HOLLOW WAY & FIELD SYSTEM, ABOVE COED SADWRN	SH76256695	Transport	HOLLOW WAY	Medieval
276890	PONT NEWYDD BRIDGE	SH75876714	Transport	BRIDGE	Post Medieval
276893	ARDDA FIELD BANK V	SH76596613	Agriculture and Subsistence	BANK	Medieval
276894	ARDDA FIELD BANK VI	SH76416608	Agriculture and Subsistence	BANK	Medieval
276895	ARDDA FIELD BANK VII	SH76396604	Agriculture and Subsistence	BANK	Medieval
276896	ARDDA FIELD BANK VIII	SH76536624	Agriculture and Subsistence	BANK	Medieval
276897	ARDDA FIELD BANK IX	SH76556639	Agriculture and Subsistence	BANK	Medieval
276898	ARDDA FIELD BANK X	SH76556637	Agriculture and Subsistence	BANK	Medieval
276899	ARDDA PIT	SH76496620	Unassigned	PIT	Unknown
276900	ARDDA FIELD BANK XI	SH76486618	Agriculture and Subsistence	BANK	Medieval?
276904	COED SADWRN TRACK	SH75876713	Transport	TRACKWAY	Medieval?

<b>NPRN</b>	<b>NAME</b>	<b>NGR</b>	<b>BROADCLASS</b>	<b>TYPE</b>	<b>PERIOD</b>
300990	ARDDA, MEDIEVAL TOWNSHIP	SH76506614	Domestic	TOWN	Medieval
408040	Pant-Y-Meurig Terraced Fields	SH75826769	Agriculture and Subsistence	Field system	Prehistoric;Medieval

## **APPENDIX 2: Definition of terms**

### **Categories of importance**

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

#### *Category A - Sites of National Importance.*

Scheduled Ancient Monuments, Listed Buildings of grade II\* and above, as well as those that would meet the requirements for scheduling (ancient monuments) or listing (buildings) or both.

Sites that are scheduled or listed have legal protection, and it is recommended that all Category A sites remain preserved and protected *in situ*.

#### *Category B - Sites of regional or county importance.*

Grade II listed buildings and sites which would not fulfil the criteria for scheduling or listing, but which are nevertheless of particular importance within the region.

Preservation *in situ* is the preferred option for Category B sites, but if damage or destruction cannot be avoided, appropriate detailed recording might be an acceptable alternative.

#### *Category C - Sites of district or local importance.*

Sites which are not of sufficient importance to justify a recommendation for preservation if threatened.

Category C sites nevertheless merit adequate recording in advance of damage or destruction.

#### *Category D - Minor and damaged sites.*

Sites that are of minor importance or are so badly damaged that too little remains to justify their inclusion in a higher category.

For Category D sites, rapid recording, either in advance of or during destruction, should be sufficient.

#### *Category E - Sites needing further investigation.*

Sites, the importance of which is as yet undetermined and which will require further work before they can be allocated to categories A - D are temporarily placed in this category, with specific recommendations for further evaluation. By the end of the assessment there should usually be no sites remaining in this category. In this case several areas of unknown potential have been allocated to this category. These require environmental sampling which should be carried out during the pipeline works.

### **Definition of Impact**

The impact of the proposed pipeline on each site was estimated. The impact is defined as *none, slight, unlikely, likely, significant, considerable or unknown* as follows:

#### *None:*

There is no construction impact on this particular site.

#### *Slight:*

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

#### *Unlikely:*

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

#### *Likely:*

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

*Significant:*

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

*Considerable:*

The total removal of a feature or its partial removal which would effectively destroy the remainder of the site.

*Unknown:*

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

*Definition of field evaluation techniques*

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

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

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

**Definition of Mitigatory Recommendations**

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

*None:*

No impact so no requirement for mitigatory measures.

*Detailed recording:*

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

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

*Basic recording:*

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

*Strip, Map and Sample:*

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

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

*Watching brief:*

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

*Avoidance:*

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

*Reinstatement:*

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

### APPENDIX 3: Gazetteer of sites found during the desk-based assessment and field walk-over

See figures 1, 8, 9 and 10 for location of sites

**PRN 676** (NPRN 56632) Ardda, Medieval Township

**NGR** SH76506614

**Period** Medieval

**Category:** A      **Impact:** Slight

Documentary evidence shows the township of Ardda to be mentioned in the 15th century and occupied until the late 18th century. The surviving building remains are probably 17<sup>th</sup> or 18<sup>th</sup> century, but many probably occupy sites of earlier houses. The cottages follow a standard pattern, which includes an associated beudy and enclosure (RCAHMW 1956, 75). Where the field boundaries are parallel to the hill slope they are terraced and very well defined but those running down the slope are much slighter and some are difficult to see. One field boundary and three building platforms not shown on the Royal Commission plan were identified during the field walkover so the full extent of the archaeology in this area is not yet known.

The access route runs through the middle of this area. In the field to the north-east of Tai-Isaf-Ardda disturbance can be avoided but where the modern field track cuts across the slope north-west of the leat the track will have to be widened on the upslope side. This will cut into various field boundaries and other features (plate 1). Topographic survey will help to identify exactly which features are at risk and allow some additional interpretation of these and recording of the sections dug will provide information on these features and help to mitigate any damage.

**Recommendations for further assessment:** Topographic survey

**Recommendations for mitigatory measures:** Detailed recording of sections across features

**PRN 679** (NPRN 56635) Cottage, Ardda

**NGR** SH76406601

**Period** Post-medieval (17<sup>th</sup>/18<sup>th</sup> century)

**Category:** A      **Impact:** Unlikely

'Cottage 27 ft by 10ft 6ins, with axis NE-SW, on ground sloping to SE. There is a fireplace in the SW end' (RCAHMW 1956, 74). This is still quite well preserved with walls built of large boulders standing up to 0.7m high (plate 2). This cottage with associated buildings is shown on the 1780s estate map.

**Recommendations for further assessment:** Topographic survey

**Recommendations for mitigatory measures:** Avoid

**PRN 680** (NPRN 56636) Long Hut, Ardda

**NGR** SH76656616

**Period** Medieval

**Category:** A      **Impact:** None

"21 ft by 12ft, axis NE-SW, entrance in SE wall, small yard SE" (RCAHMW 1956, 76). This is not shown on the 1780s estate map and the visible remains are presumably medieval.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Avoid

**PRN 3861** (NPRN 63322) Site of Fulling Mill, Ardda

**NGR** SH7741 6630 (corrected from SH77306630)

**Period** Medieval?

**Category:** A      **Impact:** None

It has been suggested that a *pandy* (fulling mill) located at SH 77416630 dates from the monastic period at Dolgarrog, although the first reference to this is in 1575 (Jack 1981, 88). The mill became the property of the Glynllifon estate and is recorded in the Glynllifon archive (Gwynedd Archives, Caernarfon) between 1787 and the break-up of the estate in the mid 20<sup>th</sup> century. A painting of this mill by William Muller hangs in the Williamson Art Gallery, Birkenhead. It was replaced by a woollen factory in c.1803 (Gwyn 2006, 121), and there was also a saw mill on the site (Jones and Gwyn 1989, 23, 24). A fulling mill is shown on the 1788 estate map and 1846 tithe map next to the Afon Ddu near the base of the escarpment (figures 4 and 6). The OS maps show woollen mills in this location. Ruins of a structure were noted at SH7742 6627 in 2001 (Davidson and Kenney 2001, section 8.4.4), but it is not clear whether these relate to the fulling mill or the later woollen mills.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Avoid

**PRN 11690** (NPRN 23789) Pont Dolgarrog, over Afon Ddu (grade II listed building refs 3183 and 16952)  
**NGR** SH77456630

**Period** Post-Medieval

**Category:** A **Impact:** None

“(Over three streams of Afon Ddu). 18th century and alterations. Stone with 3 separate arches some distance apart. Parapets. Inset voussoirs” (from NPRN long text). Listed as “an unusually long 3-span vernacular road bridge”.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Avoid

**PRN 12955** Coed Sadwrn Cottage

**Grid ref:** SH76166708

**Period:** late medieval/early post medieval

**Category:** B **Impact:** None

A ruined and roofless cottage was recorded here in 1956 and described as being of former croglift type, about 6m by 3.7m and constructed of mortared rubble, with a farm building to the south-west of one built with the house. The fireplace, at the north-east end was 2.3m by 1.2m deep, with a large beam slightly cambered and chamfered (RCAHMW 1956, 74). The cottage has been reroofed, although there is no evidence that it had completely lost its roof, and maintained to ensure it is sound and weather proof. The farm buildings to the SW are ruined. Both cottage and farm buildings are shown on the 1788 map. The farm is marked on the 1816-1824 map, named on the 1847 tithe schedule and all the buildings are shown on the 1889 map. The site of the farm is clearly the focus of the fields in this area and in comparison with similar farms in neighbouring areas it probably dated from at least the 16th century.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Avoidance

**PRN 12956** (NPRN 276387) Tai Isaf Ardda

**NGR** SH76556597

**Period** Post-Medieval

**Category:** A **Impact:** None

This farm is still in use. It is named as Ardda on 1780s map (figure 2) and shown with several buildings, but not shown specifically on tithe map. Named as Ty isaf y Ardda on the 1816-1824 map. Gresham (1983, 341) considers it possible that this was the principle farm of the monastic grange of Ardda.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Avoidance

**PRN 12957** (NPRN 26320) Cottage & Enclosure

**NGR** SH76506614

**Period** Post-Medieval/medieval

**Category:** A **Impact:** Slight

The cottage has drystone walls and is associated with a sub-circular enclosure with attached beudy (RCAHMW 1956, 74). It is on 1780s estate map, but not shown on tithe map. The remains are largely collapsed and confused but the plan can still be distinguished (plate 3). A trackway seems to run north-east along a well-defined terrace. The track and field boundaries associated with this cottage are not shown on the 1780s map and it is likely that these are much earlier. As they are clearly related to the cottage it demonstrates that this is on the site of a medieval cottage or farmstead.

Widening the field track will cut into the banks associated with the enclosures and track. Topographic survey will help to identify exactly which features are at risk and allow some additional interpretation of these and recording of the sections dug will provide information on these features and help to mitigate any damage.

**Recommendations for further assessment:** Topographic survey

**Recommendations for mitigatory measures:** Detailed recording of sections across features

**PRN 12962** (NPRN 276835) Track to Ardda

**NGR** SH76806611

**Period** Medieval?

**Category:** B **Impact:** Unlikely

Track terraced into the slope and turning into a less well-defined route across the pasture field at its western end. Although some stones are present in the terrace scarp below the track not clear evidence of revetting was seen. The track is shown on the 1780s estate map leading to Tai-isaf-ardda (figure 2). It seems likely that the

medieval route to the Ardda township was along a route close to or the same as the existing track but no evidence of the medieval track could be seen.

The terraced section of the track has been previously widened and improved and it seems unlikely that remains of the medieval track survive. This may survive under the field east of Tai-Isaf-Ardda but in this area it should not be damaged by the site access traffic. However to ensure it has been recorded in case of accidental rutting it should be included in a general topographic survey.

**Recommendations for further assessment:** *Topographic survey*

**Recommendations for mitigatory measures:** *None*

**PRN 12968** (NPRN 276552) Building

**NGR** SH76616614

**Period** *Post-medieval*

**Category:** B **Impact:** *Unlikely*

Remains of stone-built rectangular structure measuring c.18m x 5m and orientated NW-SE with further smaller structures to the west and associated earthworks in the adjacent field to the west. This is shown on 1780s estate map and possibly a replacement for PRN 680.

**Recommendations for further assessment:** *None*

**Recommendations for mitigatory measures:** *Avoid*

**PRN 12974** (NPRN 276,890) Pont Newydd Bridge

**Grid ref:** SH75876715

**Period:** *modern*

**Category:** E **Impact:** *Unlikely*

This is the site of the late medieval or early post medieval bridge but nothing can be seen of that earlier bridge. The existing bridge is of concrete and steel beams with modern stone facing to the river banks. It is possible, but unlikely, that traces of the early bridge survive beneath the modern superstructure.

**Recommendations for further assessment:** *None*

**Recommendations for mitigatory measures:** *Avoidance*

**PRN 12975** Concrete road

**NGR** SH77216619

**Period** *Modern*

**Category:** D **Impact:** *Unlikely*

Concrete road built by the water board for access to their building close to the top of the escarpment. The road zigzags steeply up the slope (plate 4).

Some of the sharpest corners may have to be widened on the upslope side. This will generally involve removing rocky outcrops with no archaeological potential.

**Recommendations for further assessment:** *None*

**Recommendations for mitigatory measures:** *Watching brief*

**PRN 15821** Coed Dolgarrog, Landscape

**NGR** SH76706690

**Period** *Multi-period*

**Category:** B **Impact:** *Unlikely*

“The steep wooded slopes of Coed Dolgarrog have probably been commercially exploited since at least monastic times. A ‘Coyde Imynoghe’ (Coed y Mynach) was one of the parcels of land offered for sale after the dissolution, and documents from the reign of Elizabeth I refer to the timber in the vicinity of Maenan Abbey” (Thompson 1999, 31).

**Recommendations for further assessment:** *None*

**Recommendations for mitigatory measures:** *Avoid*

**PRN 16195** Pipeline, Dolgarrog Hydro-electric Plant

**Grid ref:** SH7651767134

**Period:** *Early C20th*

**Category:** B **Impact:** *Unlikely*

Pipeline added when a third generator and turbine were installed in 1936. The pipeline runs from Llyn Cowlyd to a new penstock running down the valley side near parallel to the earlier penstock from the upper leat (Jones and Gwyn 1989, 128). The pipe can be seen on an aerial photograph dating to 1942.

Refurbishment work was being carried out on this pipe in October 2010 and some ground disturbance has taken place along side the pipe.

**Recommendations for further assessment:** *None*

**Recommendations for mitigatory measures:** *Avoidance*

**PRN 16321** Dolgarrog Hydro-electric Plant

**Grid ref:** *SH7655167184*

**Period:** *Early C20th*

**Category:** *B* **Impact:** *None*

The junction of pipes and valve house known as Marble Arch, after an iron gantry footbridge over the incline. Built after 1925 (Gwyn and Nevell 2006, 8).

The original Marble Arch had to be demolished as it was unsafe.

**Recommendations for further assessment:** *None*

**Recommendations for mitigatory measures:** *None*

**PRN 16322** Incline, Ardda

**Grid ref:** *SH7650167162*

**Period:** *C19th*

**Category:** *A* **Impact:** *None*

Incline initially built for slate quarry tramway in the early 1860s and was in operation by 1864 (Jones and Gwyn 1989, 167); it is first shown on the 1889 map. It was reused in 1907 to construct a railway for building the Llyn Eigiau dam and in 1917 to build the Llyn Cowlyd dam (Jones and Gwyn 1989, 38, 169), and continued to be used in the early 20th century to take equipment up and down the escarpment. There was a winch and a ropeway on the incline in the 1950s. Much of the upper part of the incline is still well preserved with some sections in cuttings and some on stone embankments (figure 9, plate 5).

It is proposed to use the incline to support the replacement surge pipe. This would require the pipe to be buried within the cutting of the incline. On the stone ramp the pipe would be set into the stone structure and covered over. The covering has to be sufficient to prevent the pipe coming loose under the pressure of a surge. This proposal would cause the cutting to become largely invisible and the stone ramp to be largely demolished and rebuilt. It seems unlikely that the core of the ramp is of earth as stone can be seen across its full width. It therefore seems unlikely that a trench could be dug up the ramp for the pipe.

Detailed recording and a topographic survey is recommended before the incline is disturbed with a watching brief on its dismantlement.

**Recommendations for further assessment:** *None*

**Recommendations for mitigatory measures:** *Detailed recording and topographic survey, watching brief*

**PRN 16323** Relict wall, Ardda

**Grid ref:** *SH76476712*

**Period:** *late medieval/early post medieval*

**Category:** *C* **Impact:** *Likely*

Fairly well preserved drystone wall up to c0.7m high in places, but completely tumbled elsewhere. Forms part of the main boundary around Coed Sadwrn. Shown on 1889 map and shown on the 1788 map as the eastern boundary of 'Bryn Kelin' {A15}.

**Recommendations for further assessment:** *None*

**Recommendations for mitigatory measures:** *Avoid*

**PRN 16330** Iron Gate, Site of, Ardda

**Grid ref:** *SH7674366636*

**Period:** *post medieval*

**Category:** *D* **Impact:** *Likely*

An "Estate style" gate was recorded in 2002 but this has now been replaced with a modern gate and no trace of an earlier gate survives except a broken stone gatepost. (See figure 1 for location).

**Recommendations for further assessment:** *None*

**Recommendations for mitigatory measures:** *None*

**PRN 31893** Coed Sadwrn Track

**Grid ref:** *SH75946706*

**Period:** *C18th or earlier*

**Category:** B                    **Impact:** Unlikely

A trackway leading towards Coed Sadwrn. This is well defined on E side of gateway seen as a clear hollow-way with walls on either side for part of its route. The walls are tumbled and the whole is overgrown. The low-level leat has destroyed part of it but it continues on the other side. To the W of the gateway one branch of the track is quite clear as a hollow but the other branch is not visible. Shown in detail on 1889 map but track also marked on 1816-1824 map, and shown running from gateway 74 on the 1788 map.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Avoid

**PRN 31894**                    Llyn Coedty Leat

**Grid ref:** SH75666709 C

**Period:** Mid C20th

**Category:** B                    **Impact:** Unlikely

SH75576673-75686789. The leat, associated with the hydro-electric works, is orientated NE-SW running into Llyn Coedty reservoir from Rowlyn Isaf, in a concrete channel about 8m wide. It cuts through the former field systems of Bont Newydd and Ffrith Ddu. A short section of this leat was built with the dam but most was constructed in 1955-58 (Jones and Gwyn 1989, 185). The trackway by the leat was in part the route of a tramway for the construction of the leat. The route of the leat and working spaces for its construction are marked on a map in the Sidney Colwyn Foulkes Collection (Figure 7) and the route of the leat was designed by Colwyn Foulkes to minimise the impact on the landscape.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Avoid

**PRN 31895**                    Pont Newydd Cottage

**Grid ref:** SH75816715

**Period:** C18th or earlier?

**Category:** B                    **Impact:** None

The remains of a former cottage and garden. The cottage, approximately 5m by 4m, remains partially roofed and used for storage. Two ancillary buildings are attached at either end which are unroofed but still stand to full height. There is a surviving fireplace at the eastern, unroofed portion of the main building. The entrance faces south and the structure is enclosed with a low wall that incorporates a yard to the north. The cottage appears on the 1889 map. Pontnewydd is named on the 1816-1824 map, but that almost certainly refers to the bridge. It is not clear from this map that there was also a farm of Pontnewydd at this time, but it is surrounded by fields of an early character so this seems likely, however it is possible that enclosure feature 100 was the site of the original farmhouse.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Avoidance

**PRN 31896**                    Pont Newydd Structure I

**Grid ref:** SH75826720

**Period:** C19th

**Category:** C                    **Impact:** None

The remains of a small 3m square structure, which is ruined and unroofed. The standing remains are about 1m high. The area is covered in a significant amount of rubble and it is difficult to identify the floor plan, but its location to the rear of Pont Newydd cottage suggests that it was a former privy or ty bach, and possible storage area. Shown on the 1889 map.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Avoidance

**PRN 31897**                    Modern bridge

**Grid ref:** SH75766733

**Period:** modern

**Category:** D                    **Impact:** Likely

A modern concrete bridge faced with stone crossing the leat (PRN 31894). It must date from the construction of the leat in the 1950s, but is built on the line of a road that may have medieval or post-medieval origins, leading from the valley to the farms of Pont Newydd, Ffrith Ddu and Coed Ty Mawr.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Basic recording

**PRN 31907**                    Hydro-electric Pipe

**Grid ref:** SH75526674-76566718

**Period:** *Early C20th*

**Category:** *B*      **Impact:** *Unlikely*

A riveted and welded 6 foot pipe running from Coedty Reservoir to its junction with other pipes at Marble Arch, and thence down to the power station at the aluminium works. It was built on concrete piers and a plinth, and completed 1924, but there were problems with it and it failed under test and caused flooding in the village (Jones and Gwyn 1989, 74). The pipe was damaged in the flood of November 1925 and rebuilt by March 1927 (Jones and Gwyn 1989, 123).

The pipe will be decommissioned during the main works but will not specifically be impacted by the access routes.

**Recommendations for further assessment:** *None*

**Recommendations for mitigatory measures:** *None*

**PRN 31917**      Possible ridge and furrow cultivation, and other features in proposed compound field

**Grid ref:** *SH75786724 A*

**Period:** *C20th/21st*

**Category:** *D*      **Impact:** *Slight*

Slight traces of parallel narrow furrows have previously been noted in this field. These are about 1.5m wide and run downhill parallel to existing field boundaries. On close inspection it was clear that these were vehicle ruts made during the recent cutting of rushes across the field.

Other late and minor features were noted in this field. A scarp runs parallel to the leat at the base of its bank. At its north-eastern end the scarp turns north. At the corner the scarp is 1m high but decreases in height to the south-west. Stone is occasionally visible in the face of the scarp, particularly at the corner where a lump of concrete can also be seen. A field access track surfaced with hard core runs down the slope onto the platform created by this scarp, which must have been created to allow this access.

There is also a drain running south-west to north-east across the field and draining into the road-side ditch. This has created an earthwork up to 2m wide and 0.7m deep at the north-eastern end.

**Recommendations for further assessment:** *None*

**Recommendations for mitigatory measures:** *None*

**PRN 31925**      Trackway

**Grid ref:** *SH75956702 C*

**Period:** *Early C20th*

**Category:** *C*      **Impact:** *Considerable*

Track running beside Low Level Leat and built to service the leat presumably in 1925. Reuses part of the Llyn Eigiau railway trackbed and for most of its length follows the Llyn Cowlyd tramway, but the track has been extensively improved and most original features removed.

**Recommendations for further assessment:** *None*

**Recommendations for mitigatory measures:** *The track is to be improved for access. Original features such as rock cut sections should be left intact or recorded in detail. Basic recording should be carried out prior to the works.*

**PRN 31927**      Field boundary wall

**Grid ref:** *SH76146713*

**Period:** *late medieval/early post medieval*

**Category:** *B*      **Impact:** *None*

A denuded field wall with stones forming a rough line. Some of the stones are large boulders up to 1m tall but no coursing survives. This wall is shown on the 1889 map as quite straight but looks slightly wandering on the ground. It is shown on the 1788 map. The field to the E was called 'Cae Fynnon' {A8} and was arable in 1788. The field to the W was 'Erw' {A2} and was under pasture in 1788 despite the name, which suggests that it was originally enclosed for arable.

**Recommendations for further assessment:** *None*

**Recommendations for mitigatory measures:** *Avoidance*

**PRN 31928**      Former drum house and Coed Sadwrn railway yard

**Grid ref:** *SH76366712*

**Period:** *Early C20th*

**Category:** B                    **Impact:** Considerable

Corrugated iron shed on the Llyn Cowlyd tramway identified by Jones and Gwyn (1989, 180) as a drum house formed part of the Coed Sadwrn yard (Jones and Gwyn 1989, 180-181). The shed is built on a platform cut into a rocky outcrop above a level area that formed the small railway yard. The shed and the yard are shown on the 1913 map, and were part of railway for construction of Llyn Eigiau dam. The shed was the probable location of a winch in the 1950s. There was also another small shed in this area in the 1930s (Jones and Gwyn 1989, 181) but this is not on the 1913 map and seems to be a late and temporary addition.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** *This area may be impacted on considerably if the surge pipe is installed up the railway incline, and should be included in the detailed recording in advance of the works.*

**PRN 31931**                    Tramway to Cwm Eigiau

**Grid ref:** SH76056706 C

**Period:** C19th

**Category:** A                    **Impact:** Considerable

Slate quarry tramway built to service two "small and unpromising" quarries exploited between 1825 and 1873 (Jones and Gwyn 1989, 22). The tramway was constructed in the early 1860s and was in operation by 1864 (ibid, 167). The tramway was reused in 1907 to construct a railway for building the Llyn Eigiau dam (Jones and Gwyn 1989, 38, 169). Work on the dam completed Nov 1910 and in 1911 all plant removed apart from track on the incline through the woods. Again reused in 1917 as start of tramway to build Cowlyd dam.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** *The track running along the route of the tramway is to be improved as part of the current works. Basic recording should be carried out before this occurs.*

**PRN 31934**                    Incline and water pipe

**Grid ref:** SH76476704

**Period:** Early C20th

**Category:** A                    **Impact:** Considerable

Part of water catchment system for hydro-power station built for the aluminium works between 1907 and 1911, an incline taking water in a pipe from the upper leat to the power station. The incline is shown on 1913 map, although it does not indicate the pipe. The pipe was made redundant when the pipeline from Llyn Cowlyd was constructed in 1936 and 1937 (Gwyn and Nevell 2006, 8), but is still used as part of the surge protection for the Coedty system.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** *It is proposed to replace the surge pipe in a new location. If the existing pipe is to be removed and the incline disturbed this should be proceeded by detailed recording including a topographic survey.*

**PRN 31936**                    Route to Llyn Cowlyd

**Grid ref:** SH75846701 C

**Period:** late medieval/early post medieval

**Category:** B                    **Impact:** Likely

This is shown as a track on the 1816-1824 map, although not marked on the 1788 map. However the early map does not seem to mark tracks, and this route is possibly medieval or earlier. In the 18th century it passed along the north-western edge of a large field of mountain pasture called 'Castell' {A6}. This route has been much reused and altered and it unlikely that any trace of a medieval road might survive, especially as this was probably just a horse/pony path, not a paved road.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** None

**PRN 31939**                    Low Level Leat

**Grid ref:** SH76186711

**Period:** Early C20th

**Category:** B                    **Impact:** None

Leat to carry water from Afon Ddu to Coedty reservoir. Completed to Afon Ddu by 1925. Not on 1913 map but in 1950s marked as existing leat.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Avoidance

**PRN 31952** Former locomotive shed

**Grid ref:** SH76406706

**Period:** Early C20th

**Category:** B **Impact:** Unlikely

Corrugated iron shed identified by Jones and Gwyn (1989, 180) as a locomotive shed on siding on Llyn Cowlyd tramway.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** *The tramway is to be improved and care should be taken not to damage the shed or remains of the siding. Basic recording should be carried out and the area should be fenced and avoided.*

**PRN 31953** Llyn Cowlyd tramway

**Grid ref:** SH76406707

**Period:** Early C20th

**Category:** B **Impact:** Significant

This was the main branch of the Llyn Cowlyd Tramway, built 1916/1917 for construction of Llyn Cowlyd dam. It now appears as an embanked trackway. The embankment is over 6m high in places. Also cut through rock near feature 46. The tramway has been much altered to convert it into a trackway and few original features survive. Generally it is not revetted with stone but occasionally this has been necessary and original mortared stone revetments are present (e.g. approximately SH 76588 66768). There is also a concrete bridge where the tramway crosses the overflow drain from the upper leat at SH 76513 66853.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** *This route is to be improved and care should be taken not to disguise its character as a tramway by groundworks or dumping over the embankments. Original features such as rock cut sections should be left intact or recorded in detail.*

**PRN 31957** Field wall

**Grid ref:** SH75846699

**Period:** C18th or earlier

**Category:** E **Impact:** Significant

Denuded field wall running along side track. Generally largely collapsed, occasionally surviving to 0.5m high. This formed the eastern boundary of a field called 'Cae Bach' {A5} on the 1788 map. This is shown as being under arable and belonging to Coed Sadwrn rather than Coedty Mawr, but seems to be a later enclosure than the fields clustered around Coed Sadwrn.

**Recommendations for further assessment:** *If the road needs to be widened here survey and evaluation trenches are recommended to investigate the date and nature of the boundary.*

**Recommendations for mitigatory measures:** *Dependant on results of further assessment*

**PRN 31971** Field wall

**Grid ref:** SH76496718 C

**Period:** late medieval/early post medieval

**Category:** B **Impact:** None

Field wall that becomes a terrace as it descends the slope. Most of its corner has been cut away by the recent track but it continues on the other side of the incline. It generally appears as a low tumbled wall but becomes a terrace 1m high near the corner. Large oaks and coppiced hazel grow along the boundary. This is shown on the 1788 map as the north-eastern boundary of 'Bryn Kelin' {A15}.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** *Avoidance*

**PRN 31972** Corner of possible field terrace

**Grid ref:** SH76446708

**Period:** late medieval/early post medieval

**Category:** B **Impact:** Likely

The corner of a possible terrace, the same that the possible long hut (feature 55) is located on. There is a considerable scarp about 10m high most of which must be natural but the neat regular corner suggests that the terrace has been enhanced and regularised by agriculture.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** *Avoid*

**PRN 31976** Trackway leading to road from Pont Newydd Farm

**Grid ref:** SH75836722

**Period:** C19<sup>th</sup>

**Category:** C **Impact:** Unlikely

Slight, overgrown lines of stones indicate the walls bounding the track running from Pont Newydd to the road. This is clearly shown on the 1889 map, and is probably of 19<sup>th</sup> century date, although it could be earlier.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Avoid

**PRN 32144** (NPRN 408040) Pant-Y-Meurig Terraced Fields

**NGR** SH75826769

**Period** Prehistoric;Medieval?

**Category:** E **Impact:** None

Three roughly parallel scarps can be seen running south-west to north-east across the field on aerial photographs (e.g. 3G TUD UK 34/5263, dated 1946\*\*). These are recorded as terraced fields of unknown but probably early date by the Royal Commission. They are cut by the leat.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Avoid

**PRN 32145** Boundaries to road

**Grid ref:** SH7575 6793 to SH7584 6695

**Period:** C19<sup>th</sup>/20<sup>th</sup>

**Category:** C **Impact:** Considerable

See figure 8, which marks sections of boundary that are briefly described in the table forming appendix 4. Most of the length of the road proposed as the northern access is bounded by stone walls or revetments depending on the degree of terracing of the road into the slope. All these are built in drystone or rounded stones with some large sub-rounded boulders (plate 6). There seems to have been hedges along most of the boundaries, although these now survive in many places as single trees that have been coppiced, or very occasional standard trees. However in some places the hedges are still well developed if often very overgrown. Where the hedges have become degraded the boundaries have been reinforced by modern fences. Where the road crosses the leats and at the start of farm tracks the walls have been recently rebuilt, in the former case as mortared walls.

The large boulders in the base of the walls in many places is reminiscent of walls with ancient origins, but nowhere are all the foundations composed of large boulders, which suggests just opportunistic use of large field stones rather than a deliberate building style. The field boundaries in this area have not changed since the 1889 OS map and many of the boundaries can be seen on the 1846 title map. As this only shows the limits of holdings the lack of some boundaries probably just shows that they were within a holding and not that the fields were sub-divided in the late 19<sup>th</sup> century.

One proposed option for access is to widen this road by 1 or 2 metres. For most of its length this would be on the eastern side but where it descends to Pont Newydd there is a steep drop to the east and the road would be widened into the hill slope to the west.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Detailed recording and watching brief

**PRN 32146** Possible clearance cairn

**NGR** SH75785 67215 A

**Period** Unknown

**Category:** E **Impact:** Unlikely

A low hummock about 3m in diameter and 0.2m high (plate 7). It is grass covered and no stones are visible but it is noticeably circular and there are few other lumps in the field although boulders do occasionally protrude through the topsoil. It is possible that this is a clearance cairn or even a denuded funerary cairn, although its small size makes that less likely. As the importance of this feature is unknown it is best avoided by the compound.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Avoid

**PRN 32147** (NPRN 276384) Pen Ardda Tunnel

**NGR** SH76676665

*Period* Early C20th

*Category:* B *Impact:* None

Tunnel taking lower leat through a rocky spur. Presumably built before 1925 as the leat reached the Afon Ddu by that date. The Royal Commission consider it as "Part of 19th C industrialisation of landscape", but it must date to the early 20<sup>th</sup> century. (See figure 1 for location).

*Recommendations for further assessment:* None

*Recommendations for mitigatory measures:* Avoid

**PRN 32148** (NPRN 276535) Gallt Y Rhiw Stone

*NGR* SH76716650

*Period* Post-medieval

*Category:* E *Impact:* Unlikely

"Larger boulder, c. 1.50m oval at corner of track, in area of former disused Mineral Railway tunnel. Stone has series of 4cm diameter drilled holes in its exposed and side face. Over 20 holes visible" (NPRN record). Stone not found during field walkover, probably obscured by bushes or bracken. From the Royal Commission photograph (plate 8) this resembles a rock cannon, although there no channels between the holes.

*Recommendations for further assessment:* None

*Recommendations for mitigatory measures:* Avoid

**PRN 32149** (NPRN 276562) Gallt Y Rhiw trackway

*NGR* SH76666640

*Period* Modern

*Category:* D *Impact:* Considerable

Track terraced into the slope, about 3m wide. This runs diagonally across the slope from the Cowlyd tramway track to a bridge across the leat (plate 9). The Royal Commission has this track listed as possibly medieval but it is not shown on any but modern maps. It cuts through the medieval field system and there is no reason to doubt its entirely modern date.

*Recommendations for further assessment:* None

*Recommendations for mitigatory measures:* None

**PRN 32150** (NPRN 276883) Ardda cultivation ridges

*NGR* SH76676632

*Period* Medieval

*Category:* A *Impact:* Unlikely

Ridge and furrow recorded by the Royal Commission from aerial photographs but not visible at ground level.

*Recommendations for further assessment:* None

*Recommendations for mitigatory measures:* Avoid, do not dump material over this area

**PRN 32151** Possible building platform

*Grid ref:* SH76663 66286

*Period:* Medieval?

*Category:* A *Impact:* None

A platform with a steep, well defined south-east scarp about 2m high (plate 10). The platform itself is less well defined but appears to be about 9m by 6m aligned north-west to south-east perpendicular to the slope. In the northern corner of the platform is a heap of stones. These are densely packed together and include what may be the remains of an internal right-angled corner. It is possible that this is the remains of a building otherwise entirely removed.

*Recommendations for further assessment:* Include in any topographic survey

*Recommendations for mitigatory measures:* Avoid.

**PRN 32152** (NPRN 276554) Ardda enclosure II

*NGR* SH76586619

*Period* Post-medieval

*Category:* C *Impact:* Unlikely

Remains of a stone-built rectangular enclosure now partially collapsed but still with some walls up to 1m high (plate 11). Largely obscured by bracken in summer. This is suggested as possibly medieval by the Royal Commission but although it appears on the 1889 OS map it is not indicated on the 1780s estate map. The enclosure is much better preserved than most other buildings in the Ardda township and it is most probable that this is a late 19<sup>th</sup> century sheep fold, but more work would be necessary to confirm this and to confirm that there are no early features below it.

**Recommendations for further assessment:** None  
**Recommendations for mitigatory measures:** Avoid

**PRN 32153** Footpath

**NGR** SH76648 66199

**Period** Modern (early 20<sup>th</sup> century)

**Category:** D **Impact:** Unlikely

A footpath is shown on the 1913 OS map running diagonally down the slope. This explains the presence of the foot bridge over the leat. The path is not shown on earlier OS maps and there are no earthworks related to this identified on the ground.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** None

**PRN 32154** (NPRN 276875) Tai-Isaf-Ardda enclosure

**NGR** SH76466609

**Period** Medieval?

**Category:** B **Impact:** Unlikely

The Royal Commission records this as a “sub-circular enclosure approx. 12m x 8m, delineated by earth bank, poss. medieval or prehistoric. Located within post medieval walled enclosure”. This site was identified from aerial photographs and may be a misidentification. A small rectangular feature marked as a sheepfold is shown in this location on the early OS maps, but this is also shown on the 1780s estate map and was probably originally a cottage. The walled enclosure described is probably defined by the walls enclosing this small field. The walls are shown on the 1889 OS map, and also, with exception of the north-eastern wall, on the 1780s estate map. The south-eastern wall now runs along the southern side of the modern field track. There is also a low boulder wall dividing up this field, which is not shown on any available maps. It is likely that these walls have a medieval origin, but the sub-circular earth bank is probably the remains of the demolition of the sheepfold. The area has been dug into and earth and stone heaped into rough banks (plate 12). Only a concrete water trough survives in a recognisable state. A 1971 OS aerial photograph (OS 71 284/189) indicates that the sheepfold was still largely intact in 1971.

**Recommendations for further assessment:** This should be included in the topographic survey

**Recommendations for mitigatory measures:** Detailed recording of sections across features

**PRN 32155** (NPRN 276893) Ardda field bank V

**NGR** SH76596613

**Period** Medieval?

**Category:** B **Impact:** Unlikely

Field bank recorded by Royal Commission from aerial photographs. Close to this location on the ground is a series of banks and hollows that seem to be related to the buildings immediately to the east (PRN 12968).

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Avoid

**PRN 32156** (NPRN 276876) Ardda cultivation ridges III

**NGR** SH76626606

**Period** Medieval?

**Category:** B **Impact:** Unlikely

Area of ridge and furrow orientated east-west recorded by the Royal Commission from aerial photographs but not visible on the ground.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** Avoid

**PRN 32157** Footpath

**NGR** SH76585 66018

**Period** Post medieval

**Category:** D **Impact:** Unlikely

A footpath is shown on the 1889 OS map running very directly down the slope cutting straight across some steep scarps relating to the medieval field system. A bridge was built for this path across the upper leat but there was no bridge over the lower leat, unlike PRN 32153, so presumably this path was unused by the lower leat was built. Very little can be seen on the ground to define this path.

**Recommendations for further assessment:** None

**Recommendations for mitigatory measures:** None

**PRN 32158** Building platform

**Grid ref:** SH7650 6607 A

**Period:** Medieval?

**Category:** A **Impact:** Unlikely

A roughly rectangular platform built out of the slope. The levelled area measures approximately 6m by 5m and the scarp on the south-eastern side is up to c.3m high (plate 13). The platform currently has an animal feeding trough is clearly too substantial to have been constructed for this. A building constructed on this platform would lie perpendicular to the slope in medieval fashion. The absence of a building in this location on all available maps including the 1780s estate map suggests that any building here was early and probably medieval.

**Recommendations for further assessment:** Topographical survey

**Recommendations for mitigatory measures:** Avoid

**PRN 32159** Building platform

**Grid ref:** SH76577 66067 A

**Period:** Medieval?

**Category:** A **Impact:** Unlikely

A roughly rectangular, fairly large platform built out of the slope (plate 14). The levelled area measures approximately 20m by 13m and the scarp on the south-eastern side is up to c.4m high. Low banks and scarps define the northern edges of the platform, which bulges slightly to the south-east making it less regular. A building constructed on this platform would lie perpendicular to the slope in medieval fashion. The absence of a building in this location on all available maps including the 1780s estate map suggests that any building here was early and probably medieval.

**Recommendations for further assessment:** Topographical survey

**Recommendations for mitigatory measures:** Avoid

**PRN 32160** Scarp/field boundary

**Grid ref:** SH76525 66050 A

**Period:** Medieval?

**Category:** E **Impact:** Slight

A fairly straight scarp running nearly west to east from the existing field boundary slightly down slope towards the building platform PRN 32159. The scarp is up to 2m high but decreases in height to the east. It is best interpreted as part of a medieval or prehistoric field system.

**Recommendations for further assessment:** Topographical survey

**Recommendations for mitigatory measures:** Cross on a dry day to minimise damage by vehicle ruts

**PRN 32161** Ditch/field boundary/track

**Grid ref:** SH76515 66060 A

**Period:** Post medieval

**Category:** C **Impact:** Slight

A slight linear terrace running roughly south-west to north-east along the contours. It seems to have a narrow ditch or drain on the uphill side and is not always easy to see. This seems to run between the modern gate and the earthworks related to PRN 12968. This may be a recent drainage feature but it is possible that it is the remains of an old field boundary or track between the farmsteads. Aerial photographs (e.g. OS 71 284/189, dated 1971 and 3G TUD UK 34/5376, dated 1946) suggest that this feature is the continuation of the track from the Tyddyn Wylm Mine (PRN 21499) to the south-west. 1946 5376 shows it running to a trial mine (PRN 16333) that seems to cut the track, which may have used an early version of the incline (PRN 16228) to take material to the valley floor.

**Recommendations for further assessment:** Topographical survey

**Recommendations for mitigatory measures:** Cross on a dry day to minimise damage by vehicle ruts

**PRN 32162** Ditch/field boundary

**Grid ref:** SH76628 66027 A

**Period:** Medieval?

**Category:** E **Impact:** Slight

A ditch is shown on the early OS maps running downhill from PRN 32159. On the ground this can still be seen, though largely infilled. The north-eastern side has a scarp up to 2m high at the north-western end, although this quickly reduces in height to the south-east. The difference in height either side of the ditch suggests that this has been a field boundary in the past. Its relationship to PRN 32159 suggests that it is part of the same field

system and possibly medieval in origin.

**Recommendations for further assessment:** *Topographical survey*

**Recommendations for mitigatory measures:** *Cross on a dry day to minimise damage by vehicle ruts*

**PRN 32163** Part of Track to Ardda

**NGR** SH77091 66208

**Period** *Medieval?*

**Category:** E                    **Impact:** *Unlikely*

A zigzagging track terraced into the escarpment now largely overgrown but clearly visible in the area of the grid reference. The track ran from the road to the top of the escarpment. The bottom and top of the track is used by the modern track along with occasional corners, but generally up the escarpment the modern concrete track follows a different line. The track is clearly shown on the early OS maps but the 1788 estate map shows a track zigzagging up the escarpment on a very similar line (figure 6), which would have joined with the track from Tai-isaf-ardda as shown on the 1780s estate map (figure 2). It is therefore assumed that this track or an earlier version of it provided access to Ardda township and probably had medieval origins.

**Recommendations for further assessment:** *None*

**Recommendations for mitigatory measures:** *Avoid*

**PRN 32164**                    Incline

**Grid ref:** SH77297 66117 to SH77368 66240

**Period:** *Modern*

**Category:** D                    **Impact:** *None*

An incline built of sub-rounded boulders running south-west to north-east straight down the escarpment (plate 15. It is about 1.5m wide at the top and survives to a height of up to 1.5m, although generally much lower. It has been surveyed for the digital OS map which shows it as being c.145m long. The incline is partially collapsed and covered in moss and appears to be of great antiquity but is not shown on the 1913 OS map or any earlier maps. It does appear on the 1974 1:10,000 map surveyed in 1967 and despite its appearance this is clearly a 20<sup>th</sup> century feature. It seems to have been built after the woollen mills went out of use so it seems not to be related to these and is most likely related to water board construction activity. The 1:10,000 map shows what appears to be a tramway running up the incline so it was presumably used to bring up materials either before or during the construction of the concrete road.

**Recommendations for further assessment:** *None*

**Recommendations for mitigatory measures:** *The incline runs very close to one sharp bend in the concrete road but it is recommended that if the road is widened here that the incline is avoided.*

**APPENDIX 4: Table describing segments of wall running along northern access route**

See figure 8 for location of wall segments

<b>Id letter</b>	<b>Description</b>
a	Well developed hedge with low boulder wall. Triangular field access area still survives behind road-side hedge.
b	Low boulder wall, c.1m high with occasional large boulders in base. Section of holly hedging.
c	Mature hedge
d	Low boulder wall, c.1m high
e	Stone revetted bank and wall.
f	Low boulder wall, c.1m high
g	Low boulder wall, c.1m high with occasional large boulders in base.
h	Well preserved wall c1.7m high with large boulders in base.
i	Low boulder wall, c.1m high
j	Low boulder wall, c.1m high
k	Low boulder wall, c.1m high with occasional large boulders in base.
l	Fairly well preserved wall built of rounded stones, c.1.5m high.
m	Fairly well preserved wall built of rounded stones, c.1.5m high, no occasional large boulders in base.
n	Fence and remains of collapsed wall/stone revetment
o	Earth bank, generally not revetted, occasional natural boulder visible. Good hedge on top
p	Stone revetment/wall
q	Modern fence only
r	No boundary, steep bank
s	Road terraced into slope with fence on top. Slight remains of stone revetting

## Figures and Plates

- Figure 1. Location of access routes and archaeological sites in the general area
- Figure 2. Ardda in the parish of Dolgarrog, Holland Estate map dating to 1780s (UWB Archives Bangor Ms 2383), with relevant part of the schedule. (Approximate access route in red)
- Figure 3. Coed Sadwrn, Coitia Hir and Pwll Du, from Glynllifon Estate map book dated 1788 (National Archives MS vol 96, p160). Approximate access route shown in red.
- Figure 4. Extract from the Dolgarrog tithe map of 1847 with entries from the tithe schedule for relevant properties (Conwy Archives)
- Figure 5. Extract from the Caerhun tithe map of 1846 with entries from the tithe schedule for relevant properties (Conwy Archives) (Access route shown in red)
- Figure 6. Extract from pages 176 and 177 of the book of estate maps from Lord Newborough's estate (1788) (NLW Ms maps Vol 96). Showing location of fulling mill and path to Ardda settlement with extract from the schedule referring to the fulling mill.
- Figure 7. British Electricity Authority plan showing Hydro-Electric Works at Dolgarrog, dating from the 1950s. Sidney Colwyn Foulkes Collection, Conwy Archives (C/Maps 21/2/11/1/2)
- Figure 8. Sites along northern part of access route
- Figure 9. Railway incline PRN 16322 and adjacent sites showing proposed location of a compound (overlain on 1913 OS map)
- Figure 10. Ardda township area and southern part of access route (overlain on 1913 OS map)

### Plates

- Plate 1. Field boundaries adjacent to the track in the Ardda township, PRN 676 (from east)
- Plate 2. Cottage in Ardda township, PRN 679 (from north-east)
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- Plate 12. Tai-Isaf-Ardda enclosure, PRN 32154 (from north-west)
- Plate 13. Building platform, PRN 32158 (from south-east)
- Plate 14. Building platform, PRN 32159 (from south-west)
- Plate 15. Incline, PRN 32164 (from south-west)

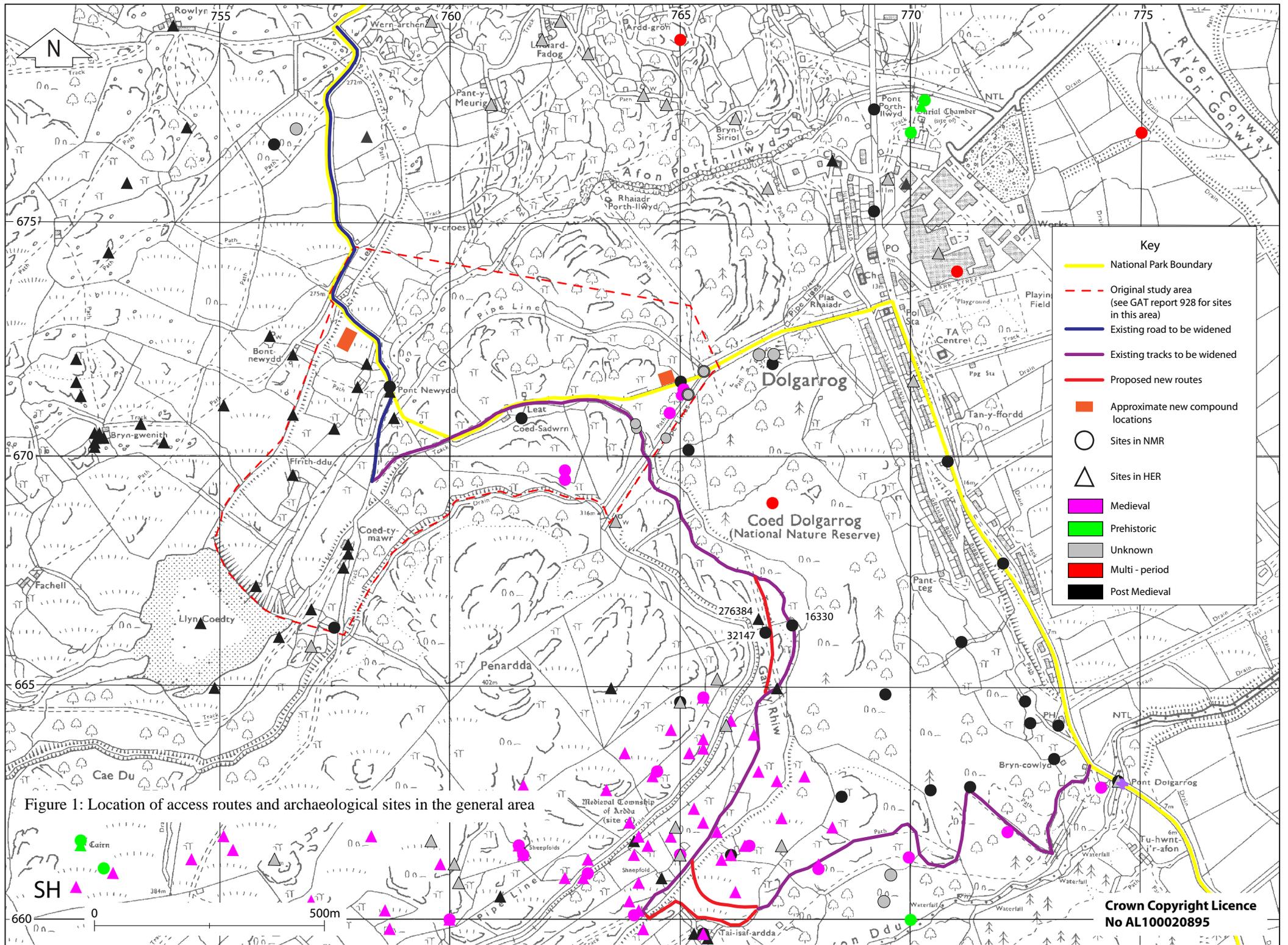
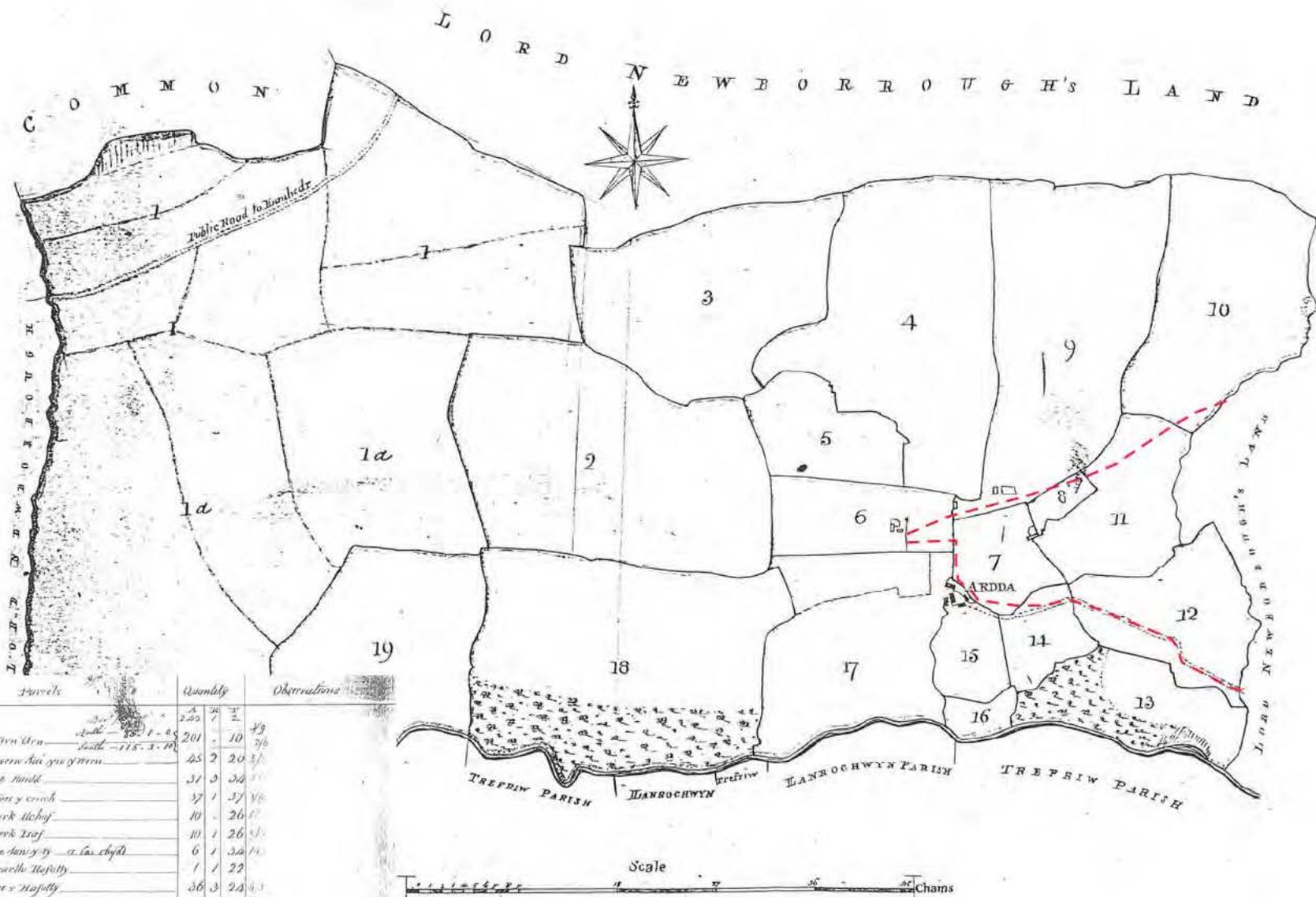


Figure 1: Location of access routes and archaeological sites in the general area



Parishes	Townships	N <sup>o</sup>	Surveys	Quantity	Observations	
Dolgarrog	Ardda	1	Wren Uen	225	1 1/2	49
		2	Wren Uen	201	10	36
		3	Wren Uen	45	20	36
		4	Wren Uen	31	3	36
		5	Wren Uen	37	1	36
		6	Wren Uen	10	26	36
		7	Wren Uen	10	26	36
		8	Wren Uen	6	1	36
		9	Wren Uen	1	22	36
		10	Wren Uen	36	3	36
		11	Wren Uen	26	2	36
		12	Wren Uen	22	3	36
		13	Wren Uen	22	2	36
		14	Wren Uen	22	2	36
		15	Wren Uen	22	2	36
		16	Wren Uen	22	2	36
		17	Wren Uen	25	1	36
		18	Wren Uen	47	2	36
		19	Wren Uen	27	3	36
					661	28

Figure 2. Ardda in the parish of Dolgarrog, Holland Estate map dating to 1780s (UWB Archives Bangor Ms 2383), with relevant part of the schedule. (Approximate access route in red)



MR HOLLAND'S LAND



Part of HLLHO Farm

Rich<sup>d</sup> Jones's LAND

North

SCALE 15 Chains to an Inch

Figure 3. Coed Sadwrn, Coitia Hir and Pwll Du, from Glynllifon Estate map book dated 1788 (National Archives MS vol 96, p160). Approximate access route shown in red.

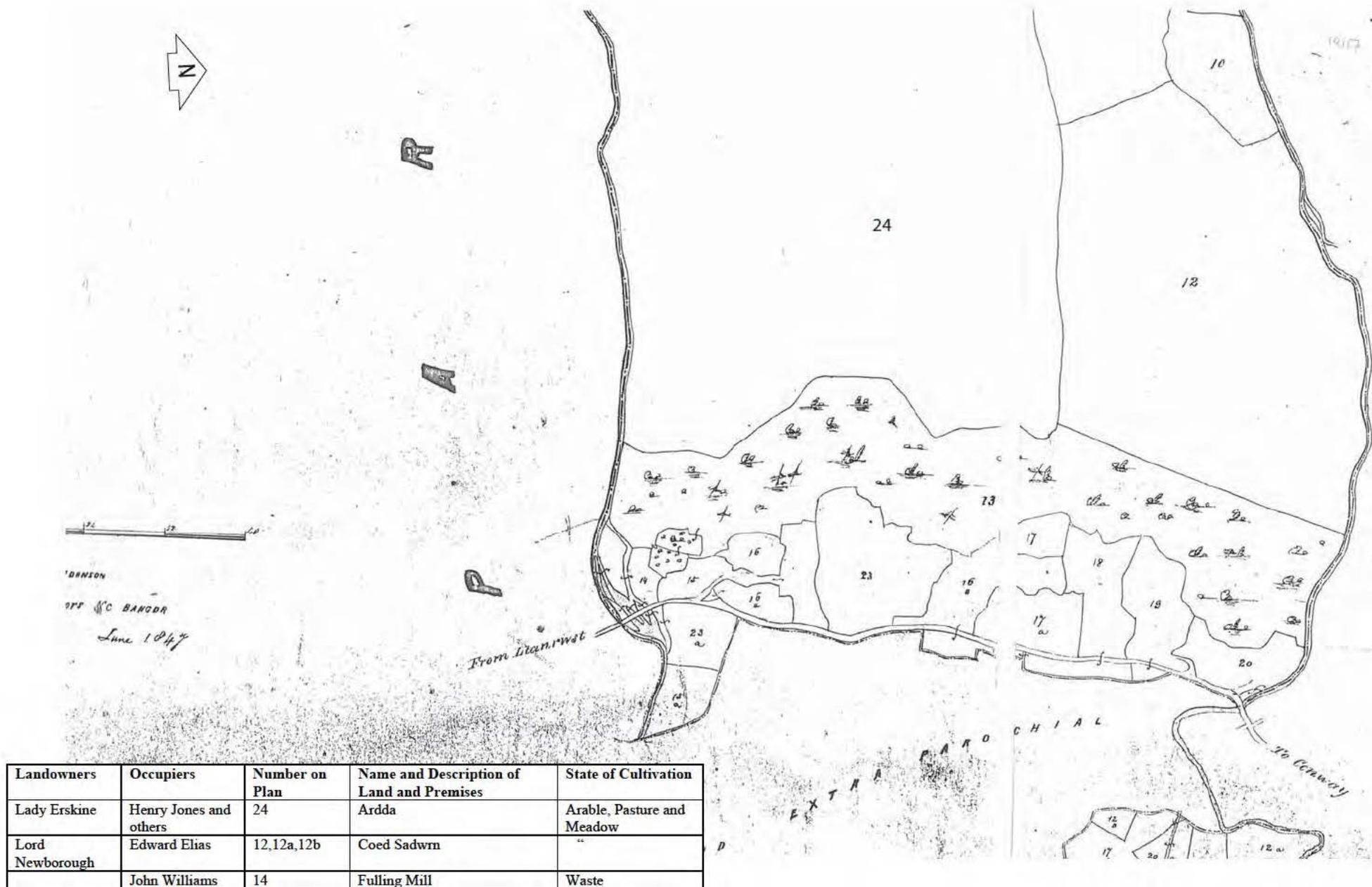


Figure 4. Extract from the Dolgarrog tithe map of 1847 with entries from the tithe schedule for relevant properties (Conwy Archives)

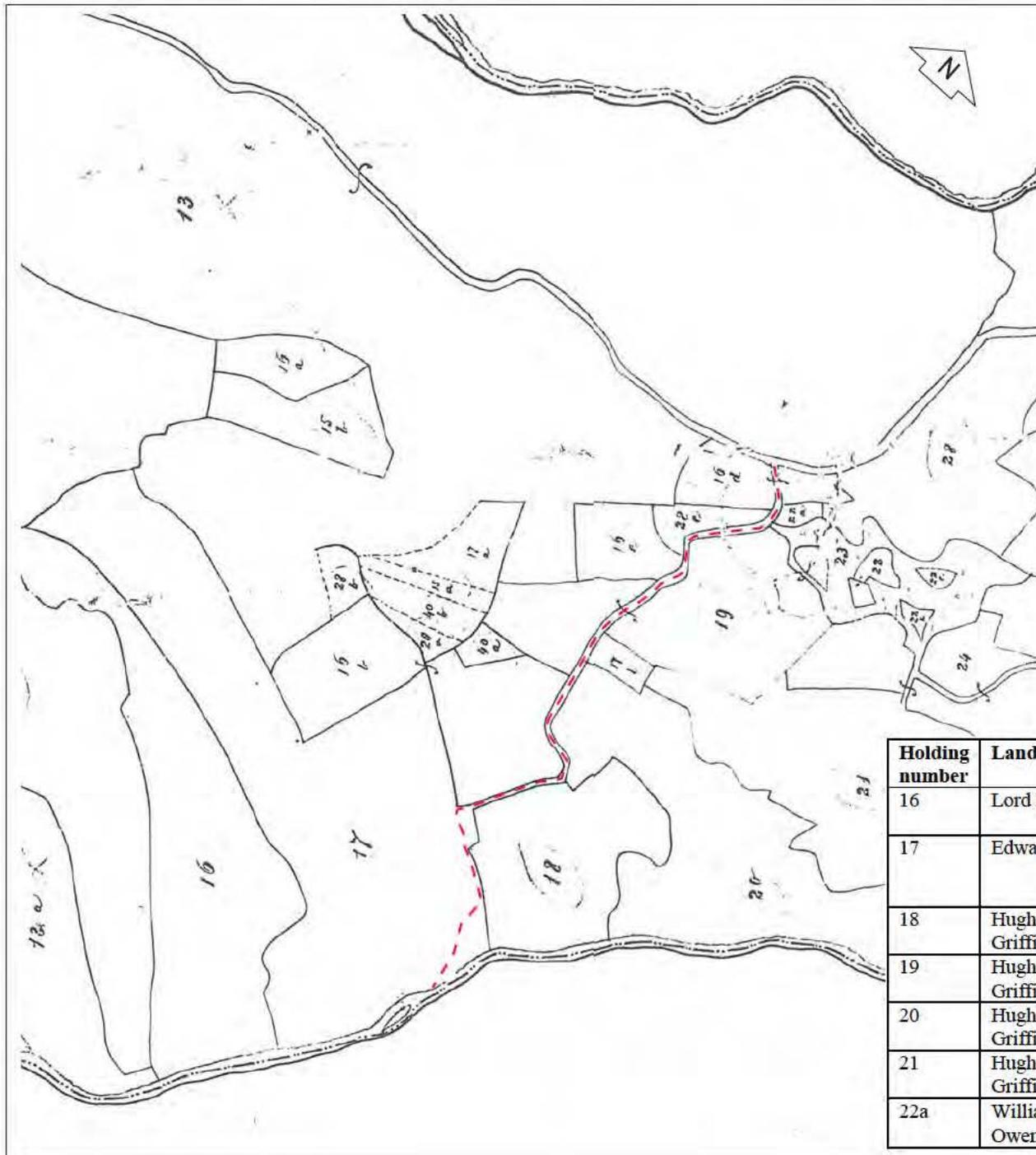
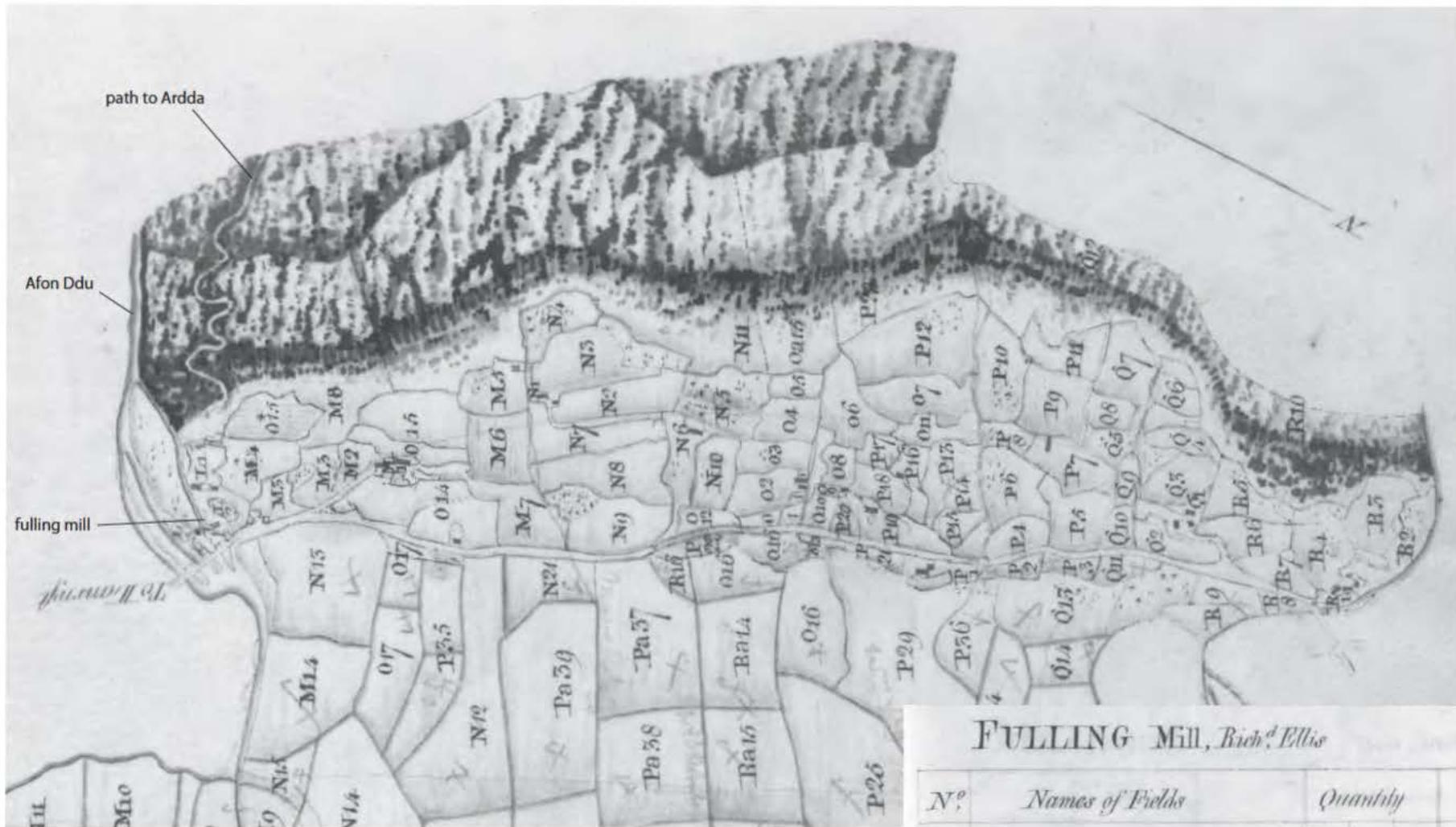


Figure 5. Extract from the Caerhun tithe map of 1846 with entries from the tithe schedule for relevant properties (Conwy Archives)  
(Access route shown in red)

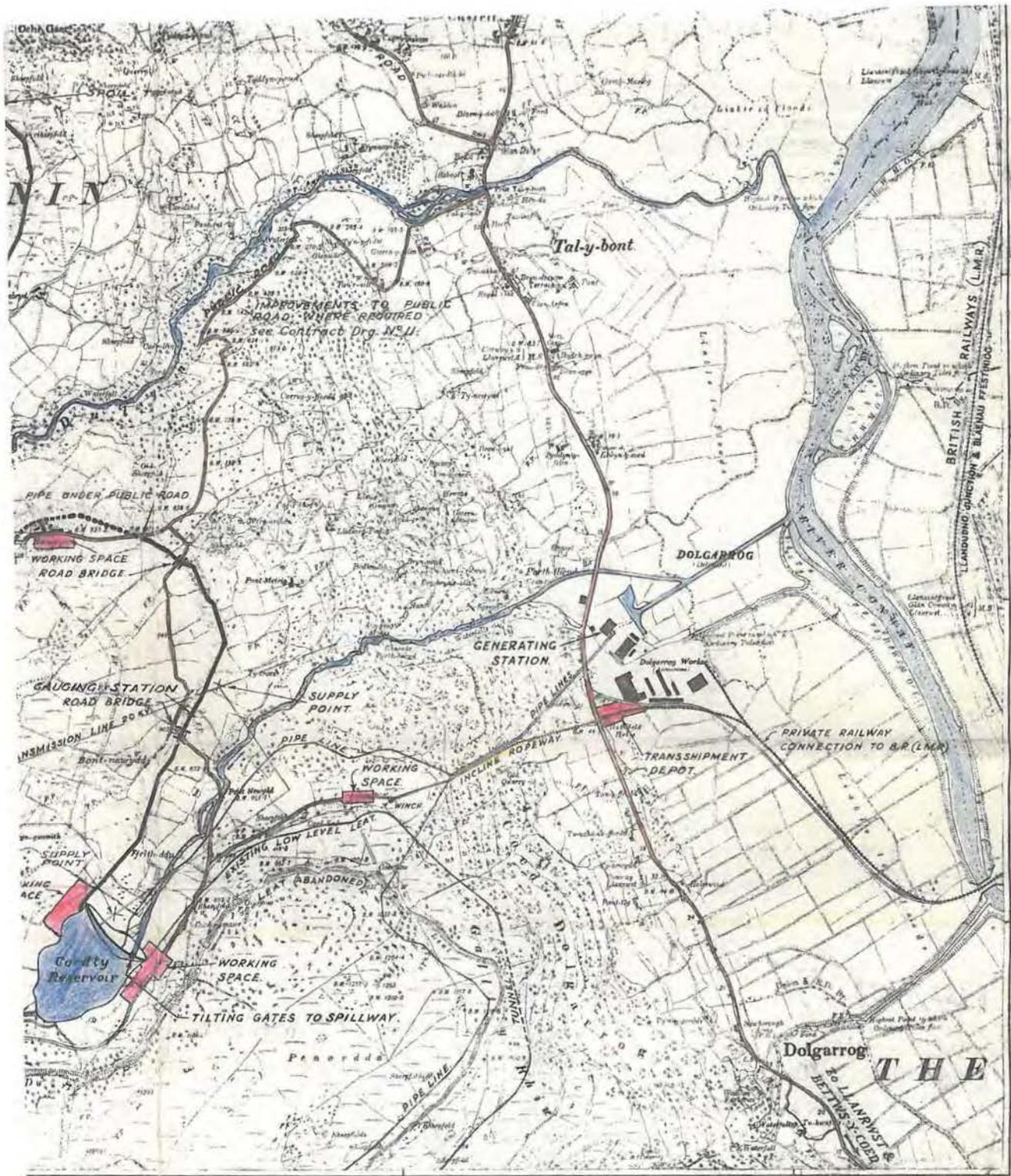
Holding number	Landowner	Occupier	Holding name	Cultivation
16	Lord Bulkley	Owen Hughes and others	Ffrith Ddu	16a- pasture, the rest arable and meadow
17	Edward Lloyd	William Roberts	Pont Newydd	Arable, pasture and meadow (17a and b: arable)
18	Hugh Davis Griffiths	Joseph Thomas	Tyddyn Du	Arable and pasture
19	Hugh Davis Griffiths	Joseph Thomas	Tyddyn Du	Arable and pasture
20	Hugh Davis Griffiths	Evan Thomas	Tre Croes	Arable and pasture
21	Hugh Davis Griffiths	Thomas Williams	Pant y Meirick	Arable and pasture
22a	William Owen	Mary Evans and others	Wern Arthen	Cottages and gardens



FULLING Mill, Rich<sup>d</sup> Ellis

N <sup>o</sup>	Names of Fields	Quantity	
L 1	House Mill and Croft	2	32
2	Garden	25	
3	Between the Rivers	20	
Meadow see Map Page 176			
	A Flour Thomas	1	16
	Total	2	13

Figure 6. Extract from pages 176 and 177 of the book of estate maps from Lord Newborough's estate (1788) (NLW Ms maps Vol 96). Showing location of fulling mill and path to Ardda settlement with extract from the schedule referring to the fulling mill.

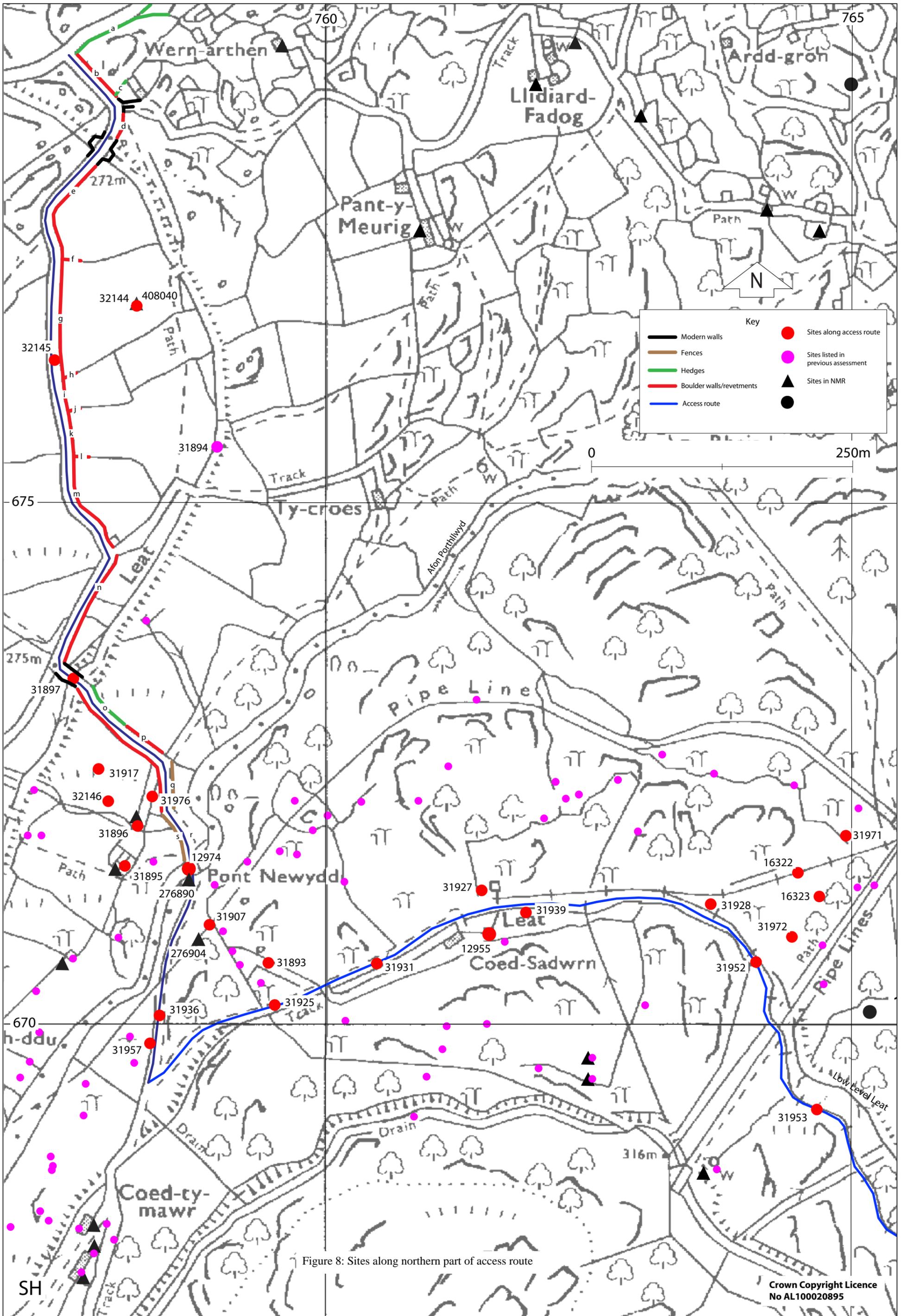


1000 2000 3000 4000 5000 5000 Feet  
 has to One Statute Mile or 880 Feet to One Inch - 78326

**BRITISH ELECTRICITY AUTHORITY**  
 MERSEYSIDE AND NORTH WALES DIVISION  
**DOLGARROG HYDRO-ELECTRIC WORKS**  
**EXTENSION TO CATCHMENT**  
**GENERAL PLAN**

CONTRACT DRG. NO. 1. DRG. NO. B. 46525  
 FREEMAN, FOX & PARTNERS  
 68, VICTORIA STREET, S.W.1.

Figure 7. British Electricity Authority plan showing Hydro-Electric Works at Dolgarrog, dating from the 1950s. Sidney Colwyn Foulkes Collection, Conwy Archives (C/Maps 21/2/11/1/2)



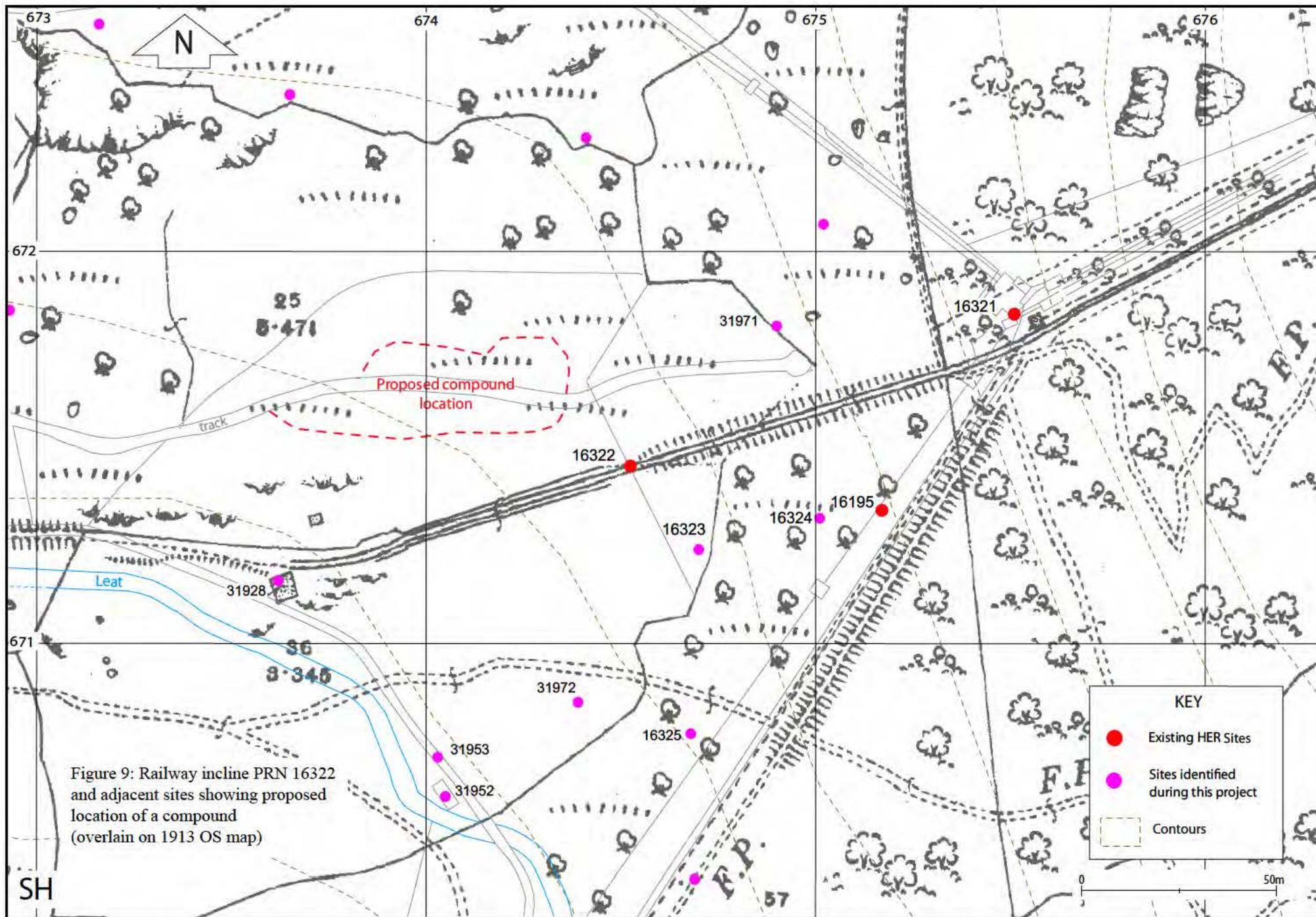
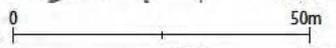


Figure 9: Railway incline PRN 16322 and adjacent sites showing proposed location of a compound (overlain on 1913 OS map)

KEY	
<span style="color: red;">●</span>	Existing HER Sites
<span style="color: magenta;">●</span>	Sites identified during this project
<span style="border: 1px dashed black; display: inline-block; width: 10px; height: 10px;"></span>	Contours



SH

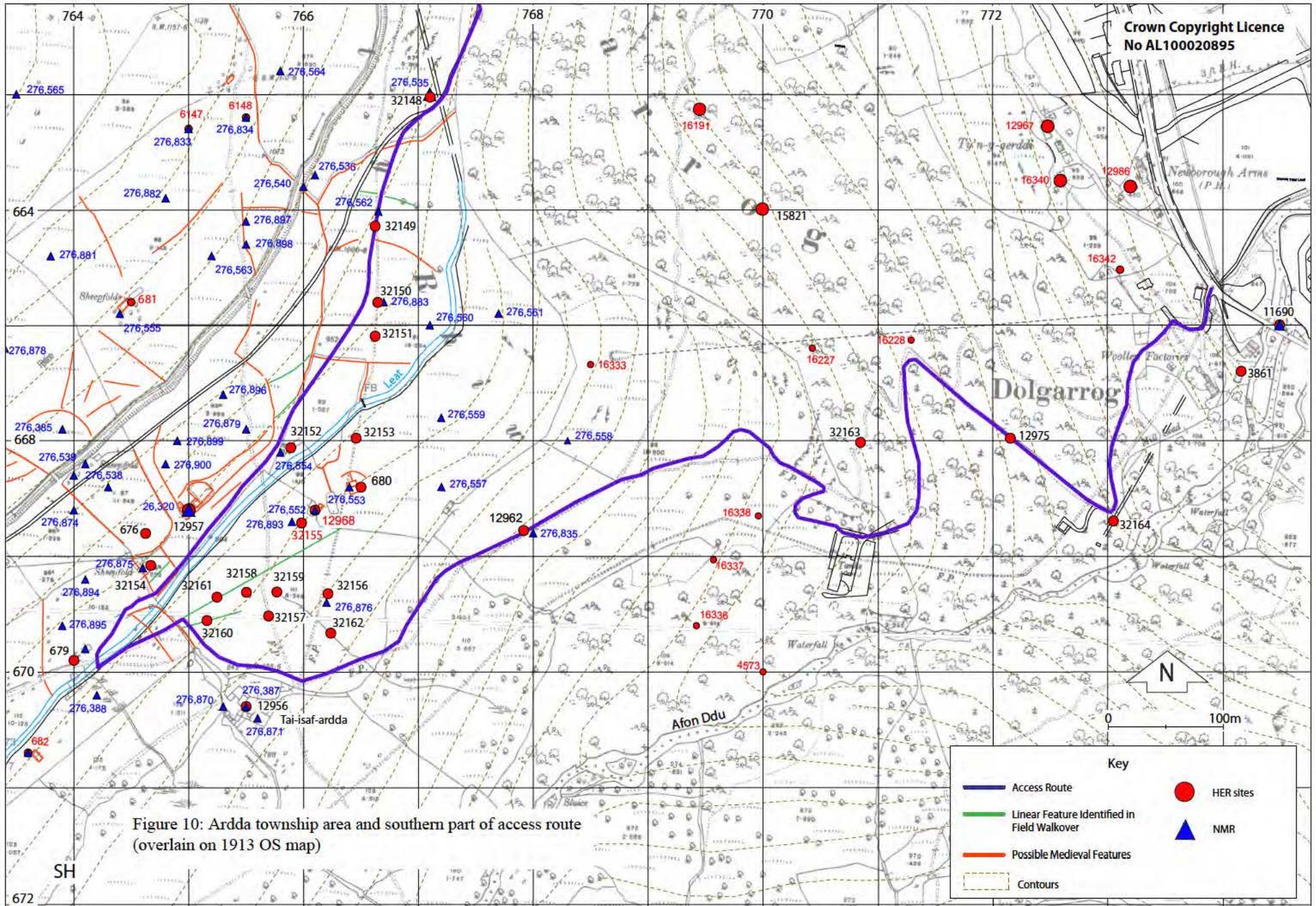


Figure 10: Ardda township area and southern part of access route  
(overlain on 1913 OS map)

**Key**

- Access Route
- Linear Feature Identified in Field Walkover
- Possible Medieval Features
- Contours
- HER sites
- NMR



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Plate 4. Concrete water board road, PRN 12975, at a bend that may have to be widened (from south-west)



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stone ramp from south-west



Plate 6. Typical roadside walls, PRN 32145,  
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Plate 7. Possible clearance cairn, PRN 32146 ,  
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Plate 8. Gallt Y Rhiw Stone, PRN 32148  
(Copyright Royal Commission on the Ancient and  
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Gwynedd Archaeological Trust  
Ymddiriedolaeth Archaeolegol Gwynedd

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