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Engineering Archaeological Services Ltd.

Anafon Hydro-Electric Scheme Archaeological Survey

I.P. Brooks

EAS Client report 2015/16

Anafon Hydro-Electric Scheme, Archaeological Watching Brief

Commissioned by

**Ynni Anafon Energy Cyf** 

Fieldwork and Analysis by: I.P. Brooks Engineering Archaeological Services Ltd

> Engineering Archaeological Services Ltd is Registered in England No 286978

### Anafon Hydro-Electric Scheme Archaeological Watching Brief

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### Introduction

### Summary

The construction of the Anafon Hydroelectric scheme was designed to cause a minimal archaeological impact. Inevitably, however a number of features were record during construction, particularly in the open land at the eastern end of the route. Two earth and stone banks were cross which are assumed to probably be prehistoric in date and a limited number of lithic artefacts were also recovered. Other features recorded included a possible hefting pen and a series of dry stone walls relating to the post medieval farming practice in the area.

### Location (Figures 1 and 2)

The pipeline runs between the intake at SH 66893 71029 and the turbine house at SH 66385 71836 within the valley of the Afon Anafon. The inlet weir was constructed at the foot of a steep slope, just below the complex sheepfold (NPRN 40071, National Trust PRN 46562). The route then crosses the slope of the northern bank of the river before crossing at SH 68408 71207. The route then runs at approximately the same level, though the open land owned by the National Trust (Plate 1) until it enters the woodland of the Coedydd Aber National Nature Reserve at SH 67846 70943. With the exception of the first 140 m, the route through the woodland followed the existing tracks which were already terraced into the hillside. The turbine house occupies a relatively flat area at the confluence of the Afon Anafon and Afon Rhaedr Fawr at SH 66386 71835. A construction compound, for the inlet weir, was also required at SH68841 71138 which was approximately 15 x 18 m in size. The majority of this area was simply stripped of its topsoil, however some levelling also took place, particularly adjacent to the track which runs through the valley. A temporary track was also constructed between this compound and the site for the inlet weir.

### Archaeological Background

The ownership of the land through which the pipeline runs is divided between the National Trust and National Resources Wales. The National Trust owns the open land at the eastern end of the route whilst National Resources Wales controls the woodland at the western end. This difference in land uses is reflected in the number of previously known archaeological features along the route. An Archaeological Assessment was carried out by the Gwynedd Archaeological Trust (Smith 2013) which consisted of a desk-top study and walkover survey carried out in April and May 2013. This was used by K. Laws, the National Trust Archaeologist for North Wales, to write a brief (Appendix 3) on which the archaeology for the project was based. The brief required a continuous watching brief to be carried out within specific areas and an intermittent watching brief on the rest of the works.

Engineering Archaeological Services Ltd submitted a specification for the work (Appendix 4) which was approved by John G. Roberts, the Snowdonia National Park Archaeologist as part of the planning control on the project. John G. Roberts also monitored the provision of archaeological services during the construction of the pipeline.

### Methodology

Parts of the route of the pipeline, together with the site of the turbine house, were defined as areas of archaeological interest in the brief (Appendix 3). These consisted of the area between

the inlet and a point on the southern side of the Afon Anafon at about SH 68161 71018, the area around the boundary between the land owned by the National Trust and Natural Resources Wales, at three locations within the woodland and at the Turbine House site.

Prior to the construction the route of the pipeline was walked to define potential archaeological conflicts. This was in addition to the walk-over survey carried out by the Gwynedd Archaeological Trust in 2013 (Gavin Smith 2013); however, the easement had been strimmed, within the open land owned by the National Trust, which allowed for other, slight, archaeological features to be located. Where possible the line of the pipeline was then adjusted to avoid these features and temporary fencing was erected to protect the known archaeology.

Within the areas of continuous watching brief a suitably qualified archaeologist was present during all groundworks including the removal of the topsoil and the digging of the trench. Features located were recorded with a written description, drawn record (both plan and section drawing if possible) and a digital photograph. Panasonic Lumix DCM-TZ60 camera with a resolution of 18.1 MP with photographs being taken in RAW (.RW2) and JPEG formats

### Results

The results of the watching brief will be discussed in five section depending on the stage of the project and location. The results of the walk over survey will be followed by the results of the watching brief itself. This will be divided into the pipe route from the inlet to the crossing of the Afon Anafon; from the river crossing to the boundary between the open and forested land; the route through the forestry and the turbine house site.

### Walkover survey

A number of features were noted in the walkover survey, prior to any groundworks. Whilst some of these were recorded in the previous survey, the strimming of the easement meant that new, slight features were recorded. It was possible to avoid the majority of these features by slightly re-aligning the route, however it was not possible to avoid four feature, these were two boundary banks which cross the line of the pipe, a stone wall and a possible hefting pen. The features will be discussed from the inlet towards the west.

Off the line of the pipe and cut into the terrace side of the river is a rectangular house platform at SH 68836 71089 (Plate 2). This feature is approximately 9.0 x 5.5 m in size and has the remains of a low stone wall, approximately 0.8 m wide along its western, southern and eastern sides. The platform is cut parallel to the slope. This is possibly the hut platform recorded as PRN 825 on the Gwynedd Historic Environment Record, although the grid reference is slightly different. The relationship between this house platform and the medieval remains on the opposite side of the Afon Anafon (PRN 823, 832 and 833) is uncertain, however the proximity between these features (they are within 50 m of each other) is suggestive.

The route of the pipeline crosses two earth and stone banks on the relatively flat area on the northern banks of the Afon Anafon, both of which were disturbed the construction of the pipeline and will be described in more detail below. The first of these is the most extensive forming a large enclosure on the northern bank of the river (Plates 3 and 4). The bank can be traced for some 600 m forming an enclosure approximately 475 m long and up to 140 m

wide. The date of this enclosure is uncertain, however its line is disturbed by the construction of a rectangular building which was later converted into a sheepfold at SH 68667 71258 (PRN 349). This feature has previously been recorded as PRN 3889.

The second bank has not been previously recorded. It runs for a short distance from SH 68494 71237 and SH 68492 71225 and is approximately 1 m wide, but only 0.1 m high (Plate 5). It runs from a spread of stone (PRN 818, Plate 6) which appears to be the disturbed remains of a circular building to the break of slope above the river. The relationship between this feature and PRN 818, however is uncertain.

A second, slightly better defined circular feature is located at SH 68455 71241 which has been previously recorded as PRN 817 as "Circular structure said to have been erected by a group of young men coming back to Aber from Australia in early 19 century" (<u>http://cofiadurcahcymru.org.uk/arch/query/page.php?watprn=GAT817</u>), however its current form is closer to a prehistoric round house (Plate 7). Adjacent to this feature, at SH 68463 71235, however is a previously unrecorded sunken stone box (Plate 8), probably a cist. This feature is approximately 1.5 m long and 0.5 m wide and is lined with stone blocks on at least three sides. Both of these features were protected with a temporary fence from accidental damage.

On the southern side of the Afon Anafon the route passes to the west of the remains of a groups of two roundhouses previously recorded as PRN 342 which were avoided as part of the planning of the pipeline. The strimming of the route, however revealed two possible cairns and a sub-rectangular platform which are previously unknown. The possible cairns were located at SH 68369 71171 (Plate 9) and SH 68350 71160 (Plate 10), each of these are relatively small, being less than 3 m in diameter, and only approximately 0.1 - 0.2 m high. At SH 68270 71104 a low, diffuse bank appears to define a rectilinear area approximately 2.0 x 3.0 m in size (Plate 11). It was possible to adjust the line of the pipeline slightly to avoid all of these features and temporary fencing was erected to protect them during construction. Further to the west there is a marked scarp on the hillside, slightly to the south of the pipeline (Plate 12) This appears to mark the southern side of a shelf on which the pipeline ran and although it may be the result of soil creep on the relatively steep slopes of the valley it may also mark the upper side of a possible trackway crossing the side of the valley.

The original boundary between the land now owned by the National Trust and Natural Resources Wales was slightly to the east of the current wire fence and was marked by a stone wall (Plate 13). Now tumbled this wall marks the western side of a small stream and is partly terraced into the hillslope. At SH 67854 70935 the remains of a small pen was recorded (Plate 14) which is assumed to have been a hefting pen. Both of these features were disturbed by the construction of the pipeline and will be further discussed below.

### Inlet to the River Crossing

The stripping of the topsoil from the inlet construction compound revealed no archaeological features, however, two artefacts made on the local vein quartz were recovered at SH68847 71138 (Plate 15, see below). Neither of these were particularly well made, but one appears to have retouch along one end suggesting it has been used as a scraper. Whilst they are essentially undatable the size and use of such a poor raw material may suggest a Late Mesolithic association.

Within the spoil from the digging of the trench at SH 68819 71097 a large flake of stone was found (Plate 16). This was on a distinctive lithology unlike that of the boulders in the immediate vicinity and it demonstrates a clear knapping strategy. There is a prepared platform and at least two deliberate flake scars on its dorsal surface demonstrating that it is not an accidental artefact. Whilst, again, this artefact is essentially undatable the size and style of knapping may suggest possible Neolithic or Early Bronze Age affinities.

The pipe route crossed the line of the bank forming the enclosure PRN 3889. This is a low earth and stone bank, up to 2.90 m wide and 0.30 m high which appears to have stone boulders marking each of the edges (Plate 17, Figure 3) and a mixed stone boulder and earth core (Plate 18). Particular care was taken when crossing this feature, the topsoil on the easement was stripped to either side of the bank and only the pipe trench excavated though the feature. Unfortunately no dating evidence was recovered from this feature. It is part, however of an extensive enclosure defining an area of 475 m long and up to 140 m wide on the northern bank of the river. The bank itself can be traced to the break of slope to the river channel at SH 68770 71100 and via a large loop to the point where it is cut by the modern track through the valley at SH 68328 71267. There is a break in the bank between SH 68664 71251 and SH 68632 71264 as the result of later disturbance. This was due to the construction of a rectilinear building which was later converted into a sheepfold. The form of this structure would suggest a late medieval or post-medieval date for its construction suggesting the bank predated this period. There is also no clear relationship to the known medieval features within the valley, which given with the form of the bank may suggest a possible prehistoric date for the enclosure.

The stripping of the topsoil to the north of the track running along the valley at SH 68667 71194 revealed two, parallel features 0.80 m apart, which diverge from the track and run for a distance of 26 m (Plate 19) Each of the linear features were between 0.2 and 0.3 m wide, but were less than 10 mm deep. Their form would suggest they are the result of a modern vehicle leaving the track during wet conditions and leaving slight ruts compressed into the sub-soil. Indeed these features correspond with the gauge of the vehicle currently being used by the tenant farmer.

A live 2" mortar round (Plate 20) was found during topsoiling at SH 68615 71221. This was destroyed by the bomb squad.

The second boundary crosses by the pipeline was less well defined, it runs between the break of the slope for the river channel at SH 68491 71218 to the point where it merges with a stone spread at SH 68494 71237. The bank is only between 0.6 and 1.0 m wide and up to 0.10 m high (Plates 21 and 22, Figure 4), but is a clear feature within the landscape. It is constructed of earth and large stones is unlike the other bank as this feature does not have the structured form with stones lining both sides of the bank, but has the stones and earth forming a single context. This bank does, however, mark a difference in the appearance of the subsoil. The stripping of the topsoil revealed that there are few, if any, boulders and larger stones in the area between the bank and the break of slope for the river to the west (Plate 23). This is unlike the eastern side of the bank which has the occasional boulder. Whilst this may be a function of the local glacial geology the proximity of prehistoric round houses (PRN 818, 342) and a medieval hafod (PRN 817) may suggest that this area could be a deliberately cleared area, possibly either a prehistoric field or a garden associated with the hafod.

A single flint artefact was recovered at SH 68419 71208 on the eastern bank of the Afon Anafon. This is a light weight awl made on a re-used flake reflecting the difficulties of obtaining raw materials in North Wales.

### **River crossing to the Forestry**

A second live mortar round (Plate 25) was found on the western bank of the Afon Anafon at SH 68384 71201. This was also destroyed by the bomb squad.

Little archaeology was recorded between the river crossing and the boundary between the land owned by the National Trust and the forestry. This is largely because of the local topography with a relatively steep side slope making this area unsuitable for archaeological features. At the western end of this section, however there is the remains of a tumbled stone wall running parallel to a small stream running, approximately north – south, near to the current property boundary. Attached to this boundary there was the remains of a small pen, at SH 67851 70945, (Plate 26, Figure 5) marked by a single layer of stone blocks defining an area 1.28 x 1.0 m in size. The stones defining this area were different from the general scatter from the collapse of the wall being clearly placed rather than tumbled. It is assumed that this was a small animal pen, probably a hefting pen.

The wall stood to a maximum height of 1.1 m and was 0.8 m thick (Plates 27 and 28, Figure 6). It revets the side of the stream with a difference of about 1 m between the two sides of the wall. It is assumed that this was originally the boundary between the two properties with the current boundary now marked by a wire fence approximately 3 m to the west.

### Through the forestry

Approximately 50 m into the forestry the remains of a disused fence line was recorded at SH 67793 70955 (Plate 29). This fence consisted of four strands of wire supported by flat metal posts. The straining posts, however are of a distinctive form being circular cross sectioned, metal posts with an ogee cap. Wires are held by metal eye and the post immediately on the south of the pipeline has pintels attached to its southern side marking the position of a gate. Clearly a modern feature this fence line makes little topographic sense, however it corresponds with the legal boundary to the land owned by the National Trust

Once the pipeline had been dug down the relatively steep slope to the end of a forestry track at SH 67717 70994 it followed the line of the tracks through the forestry. These tracks had been already been terraced into the hillside and thus any archaeological deposits had been already destroyed. As part of the construction process the uphill side of the tracks were cut back slightly and thus a restricted watching brief was carried out on areas where previously recorded archaeological features were expected. Three boundaries were clipped by the works with only the already disturbed ends of these boundaries being further disturbed.

At SH 67556 71078 an earthen bank, or highly tumbled wall, was recorded (Figure 7, Plate 30). This is only 0.6 m high and 1.4 m wide and was partly terraced into the hillside with the eastern side of the boundary being approximately 0.5 m lower than the western side.

The area at the end of the main track into the forestry at SH 67336 71259 was highlighted as an area of archaeological potential based on a record of sheepfold (PRN 341) in this area. However the area has been highly disturbed by forestry activities and thus no evidence of the sheepfold was recorded. A single boundary was recorded in this area at SH 67331 71309 (Figure 7, Plate 31) which was either an earth and stone bank or a highly tumbled wall. The

boundary survives to a height of 0.38 m above the general ground level and is up to 1.10 m wide. The section suggest a structure with two faces of stone boulders, however the lack of stone tumble in the immediate area of the feature would suggest that it was most likely a boundary bank rather than a dry stone wall.

Another boundary was recorded at SH 66934 71613 (Figure 7, Plate 32). This is up to 0.6 m high and is 2.0 m wide and it is partly terraced into the hillside such that the western side of the boundary is 0.5 m below that on the eastern side. The form of this feature would suggest it was most likely an earth and stone bank boundary.

The three boundaries recorded in the construction phase and a fourth seen in the initial walkover phase of the project can be related to a series of boundaries seen on the First Edition Ordnance Survey map of the area (Figure 8). These reflect the agricultural division of the land before the establishment of the forestry. They can be proved to be older than the late nineteenth as they appear on the First Edition Ordnance Survey map published in 1888.

At SH 66438 71833 a modern quarry relate to the building of the tracks within the forestry is located.

### **Turbine house**

The area of the turbine house was subject to a continuous watching brief. Prior to construction the site was partly occupied by a large mound which appeared to possibly be a platform (Plate 33). The south western side of this mound was marked by a line of large boulders which lead diagonally towards the modern track which passes to the south and west of the turbine site (Plate 34). The mound was cut back as part of the digging of the foundations for both the turbine house and generator hall (Plate 35) demonstrating that this was largely a natural composing a mound of glacial gravels and boulders. There was some minor dumping of material on the mound, however the recovery of two "Northern Dairy" milk bottles from within the dumping suggest this was a modern activity.

The foundations of the turbine and generator houses were dug through a similar gravel to that which made up the mound (Plate 36), however at a depth of about 1.20 m below the ground level a band of grey clay crossed the base of the foundations of the turbine house (Plate 37). This would appear to be a palaeo channel within the gravels of the valley, unfortunately the dating of this feature is unknown. The context of this layer, however, would suggest it is likely to be glacial or early post glacial given the depth to which it is buried below a gravel containing large boulders.

### Lithic Artefacts

Two quartz artefacts, a flint artefact and a stone flake were recovered during the course of the construction works, all from the area to the east of the river crossing. None, however were from a secure context and they are therefore only to be regarded as residual.

The quartz artefacts (Plate 15) are relatively crude, however this is a function of the poor raw material which has been used. The larger of the artefacts is a thick, tertiary flake  $30.8 \times 26.5 \times 13.7$  mm in size. Although it has numerous natural faults there is a flat platform and at least three flake scars on the dorsal surface demonstrating the human origins of this flake. The smaller artefact is based on a natural flake,  $21.7 \times 14.6 \times 9.0$  mm in size. The distal end, however has a series of abrupt, scalar removals along the distal end forming a scraping edge.

A single flint artefacts (Plate 24) was found, this a light weight awl produced on a tertiary, thinning flake. The raw material is a translucent dusky yellowish brown (10 YR 2/2 Goddard *et al* 1948) flint, probably of glacial origins. The flake on which this artefact is based is 29.9 x 15.0 x 3.9 mm in size, with a facetted platform and a series of flake scars on the dorsal surface suggesting that a thinning flake from a core tool was re-used for this tool. The distal end has a series of abrupt, scalar removals forming a straight edge at an oblique angle and forming a point in the distal, right corner of the flake.

The stone flake from SH 68819 71097 (Plate 16) is 144.6 x 94.0 x 26.6 mm in size and is of a similar raw material of to that within a series of scatter of knapped materials recorded from Llwytmor overlooking the valley of the Afon Anafon (Brooks 2014) some 800 m to the south. The lithology is distinct and unlike any of the boulders or outcrops in the immediate vicinity of the pipeline and it is, therefore, likely that the source was a glacial erratic. The flake has a trimmed platform and at least two flake scars on its dorsal surface demonstrating a level of control over the knapping process even though a hard hammer technology is suggested.

Although only few in number and disparate in character these artefacts suggest a level of prehistoric activity, possibly from the Mesolithic and into the Late Neolithic or Early Bronze Age.

### **Conclusions**

Careful planning and a flexible approach during the construction period has reduced the potential archaeological impact of the Anafon Hydroelectric scheme. Even though only limited archaeological remains and deposits were recorded the pipeline has indicated a level of human activity in the valley potentially for the whole of the post glacial period.

The lithic artefacts recovered indicate a level of earlier prehistoric activity. The quartz artefacts, from the upper construction, are probably Late Mesolithic in date suggesting probable hunting activity in the valley. The use of such a poor quality raw material suggest a level of desperation in the selection of raw materials for tool manufacture. Quartz is not a preferred material for the production of tools in prehistory. It is difficult to work, tending to be naturally cracked and faulted and it tends to be rather brittle. Whilst flint and cherts are more desirable they are not common in the landscape of Snowdonia. Indeed the only flint available in Wales comes in the form of small, worn pebbles derived from the Irish Sea Till and its derived gravel deposits. The use of low quality raw materials in the Late Mesolithic has been noted elsewhere, particularly in Yorkshire (Myers 1989 133). This was particularly documented in the changes in the selection of raw materials between the Early and Late Mesolithic with the exploitation of a much wider range of raw materials in the Late Mesolithic period. The small size of the distribution would suggest that the site was a possibly occupied for a relatively short period by a limited number of people, possibly as a "task specific" (Binford 1983, Butler 2005, 114) location. In such, it would correspond with Mellar's (1976, 379) "Type 1" scatter covering less than 10-15m<sup>2</sup>.

The flint and stone artefacts are clearly post Mesolithic in style, although their cultural affinities are less certain. They are probably Late Neolithic or Early Bronze Age in date suggesting at least limited human activity during this period. The flint artefacts is probably a stray tool dropped by accident, however it would suggest that some activity including punching, or drilling, holes in lightweight materials, possibly leather. The stone flake, however, is of a different character, it is a large flake of a raw material type that has been

used for the production of stone axes. There is some similarity to the lithology of the raw materials being exploited at Graig Llwyd and to the scatters of flakes on Llwytmor, which appears to be related to the exploitation of erratic blocks (Brooks 2014) on the Carneddau, suggesting an extensive industry exploiting specific rock types probably for axe manufacture. Only a single flake was recovered during the course of the fieldwork, which is probably a stay find, however its importance is in its relationship to this larger group of sites.

The later prehistoric periods are probably represented by the two banks crossed in the open area of the development. These do not appear to easily relate to the Medieval and Post-Medieval activity within the valley and therefore are probably associated with the round-houses in the locality. It can also be demonstrated that the bank forming the large enclosure was later disturbed by the construction of a rectangular structure (later converted into a sheepfold) also suggesting that the banks do not relate to the Medieval activity within the valley. One of the banks appears to form a large enclosure defining the more productive land of the valley floor, whilst the lack of stone in the area to the west of the other suggests the possibility of arable agriculture having been practiced in the valley. Unfortunately no direct dating evidence was recovered from below these features

The Post-medieval organisation of the valley is better seen in the forestry area where the presence of a series of boundary banks mark the division of this area prior to the planting of the forestry. These boundaries can be seen on the First Edition Ordnance Survey Map of the area published in 1888 (Figure 8) and the tithe map, (http://cynefin.archiveswales.org.uk/en/ tithe-maps/transcribe/#Aber&/transcribe/518007577241/&/georeference/492963857612/ &/visualize/492963857612&&/map/449387055504/) shows that at least some of these boundaries were still active in 1898. The boundaries in the forestry are of a different character to those in the open area, being slightly better persevered but also it is noticeable that two of the boundaries recorded have a marked height difference on either side of the banks suggesting a level of terracing. Although now tumbled the wall between the open and forested land marks the difference between the open ffridd and the more managed land nearer to the village of Abergwyngregyn. It also had a small pen attached to its eastern side which presumably was related to the management of sheep on the open land.

The modern use of the valley is also recorded within the fieldwork. The legal boundary between the two land owners is marked by the fence just inside the forestry. It is curious that this boundary does not follow any physical feature and does not follow the wall between the open and forested land. The tracks recorded at SH 68667 71194 appear to relate to the use of small vehicles to monitor stock in the open area and were presumably created by driving off the track during a period of wet weather whilst the ground was soft. The presence of two mortar rounds demonstrates the presence of military training in the valley. The age of the rounds is not certain, however a post-World War 2 date is probable, indeed the Bomb Squad (*pers. comm.*) suggested that this may have taken place as late as the 1970's. The presence of two unexploded rounds would also suggests that there is other ordnance yet to be found in the valley.

#### Acknowledgements

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the Snowdonia National Park Authority by John G. Roberts, the Snowdonia National Park Authority. The help of Kathy Laws, the National Trust Archaeologist is also acknowledged.

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Figure 1: Location Scale 1:25,000

> Reproduced from the Explorer OL17, 1:25,000 scale map by permission of the Ordnance Survey ® on behalf of The Controller of Her Majesty's Stationary Office © Crown Copyright 2002 All Rights Reserved Licence Number AL 100014722



1000 m

Figure 2: Extent of th Project Scale 1:7500

Background, Lidar data from http//:lle.wales.gov.uk



Figure 3: Bank 1, Plan and Section Scale 1:50





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SW

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Figure 4: Bank 2, Plan and Section Scale 1:50







Figure 5: Plan of the Hefting Pen Scale 1:50



Figure 6: Section of the Wall Scale 1:10

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Figure 7: Sections through the Boundaries in the Forestry Scale 1:20



Figure 8: Location of the Boundaries Recorded based on an Extract from the Ordnance Survey 1888 Caernarvonshire VII.SE map Re-scaled to 1:10,00



Plate 1: Panorama of the route to the south of the Afon Anafon



Plate 2: Rectangular house platform at SH 68836 71089



Plate 3: Bank (PRN 3889) looking east.



Plate 4: Bank (PRN 3889) looking west



Plate 5: Bank between SH 68494 71237 and SH 68492 71225



Plate 6: Possible round house PRN 818.



Plate 7: Possible round house PRN 817



Plate 8: Probable cist



Plate 9: Possible cairn at SH 68369 71171



Plate 10: Possible cairn at SH 68350 71160



Plate 11: Rectilinear feature at SH 68270 71104



Plate 12: Scarp at SH 68020 70959



Plate 13: Wall at possible hefting pen at SH 67854 70935



Plate 14: Hefting pen at SH 67854 70935



Plate 15: Artefacts of vein quartz



Plate 16: Stone flake



Plate 17: Bank 1, plan



Plate 18: Bank 1, section



Plate 19: Vehicle tracks



Plate 20: Mortar round from SH 68615 71221



Plate 21: Bank 2, plan



Plate 22: Bank 2, section



Plate 23: Difference in the distribution of stones either side of Bank 2



Plate 24: Flint artefact



Plate 25: Mortar round from SH 68391 71200



Plate 26: Wall and hefting pen



Plate 27: Wall



Plate 28: Section though the wall



Plate 29: Fence



Plate 30: Boundary 1 in the forestry



Plate 31: Boundary 2 in the forestry



Plate 32: Boundary 3



Plate 33: The mound before construction started



Plate 34: Line of boulders on the turbine site



Plate 35: Section through the mound at the turbine house



Plate 36: Natural boulders in side of turbine trench



Plate 37: Edge of possible river channel

# **Appendix 1: Context Summary**

Context	Location	Feature	Relationships	Description
1	SH 68493 71231	Bank 2	Above 2	"Topsoil" Very dark grey brown, humic rich slightly clayey
				loam with many bracken roots
2	SH 68493 71231	Bank 2	Below 1	Yellowish brown clayey loam with a series of rounded and
			Above Natural	sub-rounded boulders up to 220 x 130 mm in size. There is
				some suggestion that there are more than one layers of
				stones within the bank, however in general the boulders
				form a low mound along the line of the bank. There is no
				sign of a soil below this layer possibly suggesting the area
				was stripped before the bank was constructed.
3	SH 68668 71195	Tyre impression	Cuts Natural	A linear impression approximately 200 mm wide and less
			Part of 5	than 10 mm deep filled with dark grey brown humic
				material. This feature runs parallel to Context 4
4	SH 68668 71195	Tyre impression	Cuts Natural	A linear impression approximately 200 mm wide and less
			Part of 5	than 10 mm deep filled with dark grey brown humic
				material. This feature runs parallel to Context 3
5	SH 68668 71195	Track	Includes 3 and 4	A pair of parallel tracks 0.80 m apart, which are the result
				of the compression of the overlying topsoil into the sub-soil.
				It is likely that this is the result of driving a small vehicle
				off the track running along the valley
6	SH 68781 71128	Bank 1	Above 7	"Topsoil" Very dark grey brown, humic rich slightly clayey
				loam with many bracken roots
7	SH 68781 71128	Bank 1	Below 6	A layer of boulders up to 700 x 350 mm in size forming a
			Above Natural	layer up to 250 mm thick on the base of the bank. The
				larger stones tend to be on the edges of the bank suggesting
				that they were defining the edge of the feature. The matrix
				between the bounders is largely from the overlying topsoil,
				however there are small patches of the underlying yellow
				clayey gravel incorporated within the layer.

Context	Location	Feature	Relationships	Description
8	SH 67853 70946	Pen	Above Natural	A probable animal pen defined by a series of earth fast
			Abuts 9	boulders up to 700 mm x 200 mm in size defining an area
				1.3 x 1.0 m in size. This central area is clear of stones,
				whilst there is a scatter of tumble outside the possible pen.
				The feature appears to be attached to the boundary wall
				between the forestry and the open ground.
9	SH 67851 70945	Wall	Cuts Natural	A dry stone wall, 0.90 m wide, now standing to a height of
			Abuts 9	1.3 m. The wall terraced into the hillside with a single face
				to the east and boulder infill behind. The boulders within
				this wall are up to 600 x 150 mm in size. This wall forms
				the boundary between the open area of the valley and the
				forestry. It also runs parallel to a small stream
10	SH 67556 71078	Boundary 1	Above 11	Topsoil. Dark grey/brown humic rich slightly clayey loam
				with many root, largely from bracken and a few rounded
				boulders up to 250 x 160 mm in size probably derived from
				the underlying bank
11	SH 67556 71078	Boundary 1	Below 10	A bank of rounded boulders up to 290 x 230 mm in size in a
			Cuts Natural	matrix of mid brown gravelly clay. This bank appears to sit
				on the side of a terrace with the ground to the east being
				0.5 m lower than that to the west
11	SH 67331 71309	Boundary 2	Above natural	A low, tumbled mound, (0.47 m high and up to 1.1 m wide)
				probably an earth and stone bank with a series of rounded
				boulders up to 500 x 230 mm in size. The western side of
				the bank has two courses of stone suggesting it may have
				had a stone face to the west.
12	SH 66934 71613	Boundary 3	Cuts Natural	A low tumbled earth and stone bank 1.25 m wide and up to
				0.45 m high constructed of a series of rounded boulders up
				to 370 x 230 mm in a dark grey brown humic rich matrix.
				The banks sits on the side of a terrace with the ground to the
				west being 0.50 m lower than that to the east.

Frame	Scale	Direction	Subject
0001	None	W	Pre-excavation photograph of a tumbled stone wall at
			SH 66934 71613
0002	Human	SE	John Howarth pegging out area of archaeological
0002	Humon	N	Interest at SH 6/251 /148/
0003	Human	IN	SH 67338 71270
0004	None	NW	Pre-excavation photo of tumbled stone wall at SH 67556 371079
0005	Human	SE	John Howarth pegging out wall at SH 67556 371079
0006	None	S	Area of the turbine house before construction
0007	None	W	Area of the turbine house before construction
0008	None	NW	Area of turbine house before construction
0009	None		Ceremonial turf cut
0010	None		Ceremonial turf cut
0011	None	Ν	Area of the turbine house before construction
0012	None	NW	Area of the turbine house before construction
0013	None	S	Area of the outfall
0014	Human		Telling moving the machine onto site
0015	Human		Gelli moving the bench at the turbine house site
0016			Gelli moving the bench at the turbine house site
0017			Gelli in discussion by the track to the turbine house
0018	None	W	Initial works stripping access track to turbine house
0019	Machine	NE	Stripping the access track to the turbine house
0020	Human	Ν	Stripping the access track to the turbine house
0021	Machine	NW	Stripping the access track to the turbine house
0022	Machine	W	Stripping the track to the turbine house
0023	Machine	S	Subsoil surface of track to turbine house
0027	1 m	W	Mound on turbine site
0028	1 m	SE	Mound on turbine site
0029	1 m	SSE	Boulder fringe to mound at turbine site
0030	1 m	SSE	Boulder fringe to mound at turbine house site
0031	Machine	W	Gelli removing boulders
0032	Human	SSE	Gelli removing boulders
0035	Machine	SE	Stripping area of turbine house
0036	Machine bucket	SE	Cutting back the mound at the turbine site
0037	None	NE	Outfall trench
0038	None	NW	Outfall trench
0039	None	W	Outfall trench
0040	None	W	Outfall trench
0041	None	SE	Temporary stone store on top of mound at turbine site

## **Appendix 2: Photographic Index**

Frame	Scale	Direction	Subject
0042	None	NW	Outfall trench
0043	None	NW	Outfall trench
0044			Gelli refilling the machine
0045			Gelli refilling the machine
0046	None	NW	Outfall pipe in situ
0047	None	SE	Cutting back the mound at the turbine site
0048	None	SE	Cutting back the mound at the turbine site
0049	None	Е	Cutting back the mound at the turbine site
0050	None	SE	Section through the mound at the turbine site
0051	1 m	Е	Section through the mound at the turbine site
0052	1 m	NE	Natural gravels in the side of the outfall trench
0053	Human		Gelli laying out the turbine house
0054	1 m	Е	Section through the mound at the turbine site
0056	Human	SW	Digging the trench for the turbine house
0057	Human	Ν	Digging the trench for the turbine house
0058	Human	Ν	Clays in the trench for the turbine house
0059	None	S	Edge of possible palaeo channel in the base of the
0.0.60	-	<b>N T</b>	thrust pit
0060	l m	N	Possible palaeo channel in the base of the thrust pit
0061	1 m	N	Possible palaeo channel in the base of the thrust pit
0062	Human	W	Digging the turbine pit
0063	Human	W	Digging the turbine pit
0064	1 m	W	Section of the outfall pipe trench
0065	1 m	W	Wall crossing between NT land and forestry at SH 67854 70936
0066	1 m	S	Hefting pen at SH 67854 70936
0067	1 m	Near vertical	Hefting pen at SH 67854 70936
0068	1 m	W	Wall crossing at SH 67854 70936
0069	1 m	SE	Scarp at SH 68020 70959
0070	1 m	Е	Rectilinear feature at SH 68270 71104
0071	1 m	SE	Cairn at SH 68350 71160
0072	1 m	SE	Cairn at SH 68369 71172
0073	1 m	Е	Round houses at SH 68390 71177
0074	1 m	W	Break of slope above the southern side of the Afon Anafon
0075	1 m	Ν	Round house at SH 68455 71242
0076	1 m	Ν	Cist at SH 68463 71235
0077	1 m	W	Hafod at SH 68417 71228
0078	1 m and human	Е	Bank between SH 68493 71234 and SH 68493 71219
0079	1 m	SE	Bank between SH 68493 71234 and SH 68493 71219
0080	1 m	Ν	Possible round house at SH 68493 71233

Frame	Scale	Direction	Subject
0081	1 m	Е	Bank 1 at SH 68778 7117
0082	None	SW	Panorama across the valley
0083	Human	W	Thrust and turbine pits
0084	Human	NW	Thrust and turbine pits
0085	Machine	Е	Thrust block and turbine mounting
086	None	W	Thrust block and turbine mounting
087	Human	SW	General view of turbine site
088	Human	SW	Digging the pit for the turbine house
089	Human	SW	Digging the generator house
090	None	W	Iron panning in the side of the trench for the generator house
091	Human	SW	Digging the generator house
092	Human	SW	Digging the generator house
093	Human	NW	Digging the generator house
094	Human	SW	Digging the generator house
095	None	W	Iron panning in the side of the trench for the generator house
096	Human	SW	Digging the generator house
097	Human	SW	Digging the generator house
099	Human	NW	Digging the generator house
099	Machine	W	Laying out pipes on the northern bank of the Afon Anafon
100	None	Е	Laying out the pipe on the northern bank of the Afon Anafon
101	None		Welding tent
102	None		Welding machine
103	Machine	Е	Digging the ramp down to the Afon Anafon
104	Machine	Е	Digging the ramp down to the Afon Anafon
105	Machine		Crossing the river
106	Machine		Crossing the river
107	None	ENE	Ramp down to the river crossing
108	None		Mortar round
109	None		Mortar round
110	None	NE	Protection for Bank 2 whilst welding
111	None	NE	Protection for Bank 2 whilst welding
112	Human		Rescuing the welding tent after a storm
113	None	SW	River crossing
114	Machine	SW	Benching out the side slope
115	Machine	SW	Benching out the side slope
116	Vehicle	NE	Area of upper construction compound before disturbance
117	Machine	NW	Area of the upper construction compound before disturbance

Frame	Scale	Direction	Subject
118	None	NE	Panorama of the construction compound before
			disturbance
119	Machine	Е	Top soiling the compound for the upper construction
120	NT	CW	compound
120	None	SW	from the inlet
121	Machine	S	Protecting the cabins from blowing away
121	Machine	SW	Area of benching on southern side of the Afon Anafon
122	None	SW	Tumbled wall at SH 66935 71611
123	None	SE	General view down the valley from the forestry
121	None	SW	Tumbled wall at SH 66949 71614
125	None	S	Tumbled wall at SH 67254 71484
120	None	SW	Tumbled wall at SH 67331 71309
127	Human	SE	Trench across the steenest part of the valley
130	Machine	SE	Trench across the steepest part of the valley
131	Machina	NE	Stripping the area of the upper construction compound
133	Machina	INE W	Stripping the area for the inlat compound
134	Machine	W	Stripping the area of the inlet compound
135	Machine	INE W	Suppling the area of the linet compound
130	None	W	Bank PKN 3889
13/	None	W	Bank PKN 3889
139	None	SW	Enclosure PRN 3889
139	None	SW	Enclosure PRN 3889
140	None	SW	Enclosure PRN 3889
141	None	SSW	Bank PRN 3889
142	None	SW	Panorama of enclosure PRN 3889
143	Machine	S	Digging the haul road to the inlet weir
144	1 m	SW	Rectangular platform at SH 68819 71086
145	Machine	SW	Ditching the pipe on the southern side of the Afon Anafon
146	Machine	SW	Ditching the pipe on the southern side of the Afon Anafon
147	Machine	SW	Ditching the pipe on the southern side of the Afon
			Anafon
148	Machine	NE	Preparing to move the pipe on the southern side of the Afon Anafon
149	Machine	Е	Top soiling the pipeline
150	None	SW	Panorama of the pipeline on the southern side of the
151	None	SW	Panorama on the southern side of the river
152	None	SE	Route of the pipeline from the river crossing
153	Machine	SW	Route of the pipeline on the southern side of the river
154	None	SW	Sheepfold NPRN 46590
155	None	SW	Route of pipeline on southern side of the river
156	Human	SW	Using a sieving bucket to backfill
156	Human	SW	Using a sieving bucket to backfill

Frame	Scale	Direction	Subject
157	Machine		Welding the joint between the strings of pipe
158	Human		Fitting an air valve
159	Human		Fitting an air valve
160	Human		Fitting an air valve
161	Machine	W	Digging the trench north of the river crossing
162	Machine	Е	Stripping the area to the north of the river crossing
163	None	Ν	Bank 2 before disturbance
164	None	S	Bank 2 before disturbance
165	1 m	S	Bank 2 before disturbance
166	1 m	Ν	Bank 2 before disturbance
167	1 m	Ν	Bank 2 before disturbance
168	1 m	Vertical	Bank 2 before disturbance
169	Machine	Е	Stripping around Bank 2
170	Machine	W	Stripping either side of Bank 2
171	1 m	Ν	Section through Bank 2
172	1 m	Ν	Section through Bank 2
173	1 m	S	Section through Bank 2
174	1 m	S	Section through Bank 2
175	None	Е	Trench looking towards Bank 2 from the river
			crossing
176	None	Е	Trench looking towards Bank 2 from the river
177	Marah ing	CW	crossing
1//	Machine	SW	Reinstatement on the southern side of the river
170	Nana	SW	Section peer to the river crossing
1/9	None		Section hear to the river crossing
180	Inone	WINW	Supped area adjacent to the track
181	1 m	WINW	Old track, Context 5 and 6
182	1 m	WINW	Old tracks, Contexts 5 and 6
183	1 m	WNW	Uld tracks, Contexts 5 and 6
184	Machine	CW	Large natural Boulder in the trench
185	None	SW	Panorama of the reinstatement on the southern side of
186	None	SW	Panorama of the reinstatement on the southern side of
100	1 tone	5.11	the river
187	Machine	SW	Reinstatement on the southern side of the river
188	Machine	SW	Reinstatement on the southern side of the river
189	Machine	SE	The easement through the wood
190	None		Fence post in the forestry
191	None	NE	Fence line in the forestry
192	Machine	W	Benching in the forestry
193	None	Е	Reinstatement on the southern side of the river
194	1 m	Vertical	Bank 1
195	1 m	Vertical	Bank 1

Frame	Scale	Direction	Subject
196	1 m	Ν	Bank 1
197	1 m	ESE	Bank 1
198	1 m	S	Bank 1
199	1 m	W	Bank 1
200	Machine	W	Machine crossing Bank 1
201	None	S	Reinstatement of Bank 2
202	None		Mortar round 2
203	Machine	NW	Benching above hut platform
204	Machine	SE	Benching above the hut platform
205	Machin	SE	Benching above hut platform
206	Machine		Large natural Boulder on the line of the trench
207	Machine	SE	Digging through Bank 1
208	2 m	Ν	Section through Bank 2
209	2 m	Ν	Section through Bank 1
210	Machine	SE	Digging the trench above the hut platform
211	Machine	SE	Digging the trench above the hut platform
212	None	SW	Protecting Bank 1 whilst ditching the pipe
214	None	SW	Panorama after reinstatement on the southern side of the river
215	None	SW	Panorama after reinstatement south of the river
216	None	SW	Panorama after reinstatement south of river
217	None	W	Hefting pen and boundary wall
218	None	W	Hefting pen
219	None	S	Fence post in the forestry
220	1 m	W	Wall between the National Trust land and the forestry
221	1 m	W	Wall between the National Trust land and the forestry
222	1 m	S	Section through the wall
223	Machine	W	Digging bench through the wall between the National Trust land and the forestry
224	Machine	W	Digging the bench through the wall between the National Trust land and the forestry
225	1 m	S	Section through the wall
226	1 m	S	Section through the wall
227	1 m	S	Section through the wall
228	1 m	S	Section through the wall
229	Machine	S	Benching adjacent to the wall between the National Trust land and the forestry
230	None	SE	Pipe crossing the river
231	2 m	Е	Reinstatement of Bank 1
232	Human	Ν	Natural soil change on inlet track
234	None	W	Silt trap in the river
235	None	SW	Reinforcing the side of the inlet track

Frame	Scale	Direction	Subject
236	Human	Ν	Setting up the inlet compound
237	Human	Ν	Setting up the inlet compound
238	Human	Ν	Setting up the inlet compound
239	Human	Ν	Setting up the inlet compound
240	2 m	W	Digging the inlet track
241	Machine	W	Digging the inlet track
242	Human	W	Setting the silt trap
243	None	Ν	Boulder in the side of the inlet track
244	2 m	Е	Boulder in the side of the inlet track
245	2 m	W	Digging the inlet track
246	None	Ν	Silt trap
247	None	Е	Silt trap
248	Human	Е	Attempt at a second silt trap
249	Human	Е	Attempt at a second silt trap
254	None	Ν	Bank 1 from the north side of the river
255	Machine	SW	Backfilled trench
256	None	S	Fence in the forestry
258	Human	Е	Preparing the river for the bypass
259	Machine	W	Preparing for the river bypass
260	Human		Preparing for the river bypass
261	Human		Preparing for the river bypass
262	Human		Preparing the stream bypass
263	Human		Preparing the river bypass
264	Machine		Preparing the river bypass
265	None	Ν	Profile of bank on the northern side of the inlet site
266	Machine		Working on the inlet bypass
267	None	NE	Sheepfold NPRN 46562
268	Machine		Work on the inlet bypass
269	Machine	SE	Work on the inlet bypass
270	Human	SE	Work on the inlet bypass
271	Machine	NW	Work on the inlet bypass
272	Machine	W	Panorama of the inlet site
273	Machine	W	Panorama of the inlet site
274	None	NE	Sheepfold NPRN 46562
275	1 m	N	Profile of inlet works on the northern bank of the
07(	N 1		Afon Anafon
276	Machine	NW	Large boulder at the inlet site
277	Machine	NW	Large boulder at the inlet site
278	2 m	S	Southern bank of the inlet site
279	Machine	NW	Moving the large Boulder
280	Human	NW	Temporary dam
281	Human	NW	Temporary dam

Frame	Scale	Direction	Subject
282	Machine	NW	Preparing the trench through the forestry
283	Machine	NW	Preparing the trench through the forestry
284	1 m	SW	Section though Wall at SH 67555 71079
285	1 m	SE	Section though Wall at SH 67555 71079
286	Machine	S	Area in the forestry at the end of the main track
287	Machine	S	Area in the forestry at the end of the main track
288	Machine	NW	Area in the forestry at the end of the main track
289	1 m	SW	Bank in the forestry at SH 67322 71298
290	1 m	SW	Bank in the forestry at SH 67322 71298
291	1 m	SW	Bank in the forestry at SH 67322 71298
292	Vehicle	S	Benching in area at end of main track in the forestry
293	2 m	S	Modern fill in trench at the end of the forestry track
294	2 m	S	Modern fill in trench at the end of the forestry track
296	None	SSW	Modern drain in trench at the end of the main track in
			the forestry
297	Machine	Ν	Trenching an area at the end of the main track through
200	1	CW	the forestry
298	1 m	SW	Section through the stone wall at SH 66935 /160/
299	lm	NW	Section through the stone wall at SH 66935 71607
300	1 m	S	Section through the stone wall at SH 66935 71607
301	1 m	W	Section through the stone wall at SH 66935 71607
302	30 mm	Vertica l	Quartz artefacts
303	30 mm	Vertical	Quartz artefacts
304	30 mm	Vertical	Quartz artefacts
305	30 mm	Vertical	Quartz artefacts
306	30 mm	Vertical	Flint artefact
308	30 mm	Vertical	Flint artefact
309	30 mm	Vertical	Stone flake (dorsal surface)
310	30 mm	Vertical	Stone flake (ventral surface)

### **Appendix 3: Project Brief**

#### Anafon Hydro Electric Scheme, Afon Anafon, Archaeological Watching Brief Draft 3 8th January 2015

#### SNPA Planning Ref. NP3/10/110

#### By K. Laws (National Trust Archaeologist) and J. Howarth on behalf of Ynni Anafon Energy Cyf.

To be read with accompanying documents:

Anafon Hydroelectric Scheme Archaeological Assessment, GAT Report No 1135, May 2013. Map: "Anafon Scheme Layout Archaeology", (revised 8<sup>th</sup> Jan 2015).

#### 1. Site Location and Description:

- 1.1 The proposed Anafon Hydro Electric Scheme is located on the Afon Anafon in the northern Carneddau above the village of Abergwyngregyn. The scheme is being undertaken by Ynni Anafon Energy Cyf. (YAE).
- 1.2 The scheme is located between SH 68895 71030 and SH 66340 71840, see map provided.
- 1.3 The proposed project is a 270kW run of river hydro-electric scheme, comprising a new intake weir with coanda intake screen, 3km of 400mm diameter buried pipeline, and new powerhouse and substation.
- 1.4 The first 40% of the pipe route lies on National Trust land. The pipe route leaves the intake weir, contours across the hillside on the north side of the river to join the track for a short distance, before heading down to a river crossing. The pipeline then continues along the southern side of the river to the National Trust boundary. The pipeline then enters Forestry Commission land. The first 120m is through some mature conifers, some of which will need to be felled. The pipe then joins the forestry track which it follows almost to the powerhouse. Here the pipe will be installed in the south side of the track drainage ditch.
- 1.5 The pipe will be buried in a trench 600 700mm wide and 700 -1100 mm deep, with the exception of the river crossing. The river crossing would be above ground, situated above flood level to avoid disturbance to the river bed.
- 1.6 The working corridor for the pipe route is generally 7m, with up to 10m for some short stretches where there are steeper side slopes. Within the working corridor, ground the width of the mechanical excavator will be topsoil stripped prior to the excavation of the pipe trench.
- 1.7 Several construction compounds will be required. Compound 1 is adjacent to the reservoir track on the north side of the river, sited to avoid archaeological features. It will be 20m x 20m plan area. Turf and topsoil will be stripped and stockpiled around the edges of the compound. Crushed stone laid on terram will form the working surface, which will be removed on completion. Topsoil and turf will then be replaced. The other compounds are located on pre-existing hard standings on the forestry tracks.
- 1.8 The reservoir track will be used as access to the eastern parts of the scheme. Contractors will keep strictly to the existing tracks and will be made aware of the sensitivity of the site, abundance of archaeological features and their close proximity to the track and working areas. The need for careful and tight containment of working within agreed areas will be regularly reinforced on site toolbox talks.

#### 2. Archaeological Background:

- 2.1 Afon Anafon is notably rich in archaeological sites. Evidence survives for settlement, farming and burial activity, dating back to the Prehistoric period. There are a number of Scheduled Ancient Monuments in the valley.
- 2.2 In addition the valley contains examples of large multi cellular sheepfolds, a particular feature of the Carneddau.
- 2.3 General surveys of this area have been undertaken in the past by both Gwynedd Archaeological Trust and the National Trust.
- 2.4 In May 2013 as part of the feasibility study for the scheme an archaeological assessment was undertaken by Gwynedd Archaeological Trust (GAT project no. G2311, report no.1135). The assessment considered a 100m corridor centred on the pipe route and made recommendations for mitigation including an intensive watching brief at a number of locations along the route.
- 2.5 A targeted scheme of intensive watching brief and recording is proposed, see map provided. A description of the scope of works is included in section 10.

#### 3. Objectives:

- 3.1 To provide an archaeological watching brief for the Anafon Hydro Electric Scheme which allows the preservation by record of archaeological deposits, the presence and nature of which could not be established in advance of ground disturbance works.
- 3.2 To establish and make available information about the archaeological resource existing on the site.

#### 4. Methodology:

4.1 Work will be carried out in accordance with a written scheme of investigation (WSI), to be produced by the archaeological contractor based on this project brief, which must be approved in writing by the SNPA Archaeologist prior to commencement of the project.

4.2 The archaeologist will be on site to carry out an intensive watching brief (present during sensitive ground disturbance) at defined areas along the route of the pipe, see map provided.

4.3 Work will be carried out in accordance with the following Chartered Institute for Archaeologists (CIfA) regulations, standards and guidance documentation. <u>http://www.archaeologists.net/codes/ifa</u>

Standard and guidance for an archaeological watching brief Standard and guidance for excavation

Standard and guidance for the collection, documentation, conservation and research of archaeological materials.

Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives.

MAP2/MoRPHE should also be referred to.<u>http://www.english-heritage.org.uk/publications/morphe-project-managers-guide/morphe-project-managers-guide-1.1-2009.pdf</u>

4.4 The archaeologist will be present for both topsoil stripping and trench excavation of the defined areas along the route.

4.5 The archaeologist will record observations made including location, measurement, and description in as much detail as is reasonable/possible in the circumstances.

- 4.6 Where deposits are exposed in section, and where it is safe to do so, these should be recorded in drawn form as well as photographic.
- 4.7 Photographic records should be made using a digital SLR camera. Images should be shot in RAW or high resolution JPG and converted to TIFF for archive purposes. A metric scale should be included in all images.
- 4.8 Artefacts recovered should be located as accurately as possible and placed in suitable storage materials.
- 4.9 Post excavation analysis should be carried out following guidance given in MAP2/MoRPHE.
- 4.10 In the event of significant archaeological discovery a Further Archaeological Works Design (FAWD) may be required. This would need to be agreed in discussion with the SNPA Archaeologist and the client.

#### 5. Reporting:

- 5.1 A draft report summarising the work and including copies of all drawings and photographs to be submitted within one month of the completion of the work.
- 5.2 A final report to be submitted upon approval of the draft report.
- 5.3 Two paper copies of the completed report to be provided to Snowdonia National Park Authority, along with a digital copy of the archive. This should include digital copies of all paper records plus all spreadsheets, databases, survey data, photographs and a full copy of the report and illustrations in PDF format. Gwynedd Historic Environment Record and RCHAMW should also be provided with digital copies of the report.
- 5.4 The report should include:
  - A non technical summary Introduction Aims and objectives Methodology Archaeological Results Copies of drawings Copies of photographs Conclusions Recommendations for further work Appendices References and bibliography

#### 6. Monitoring:

6.1 The SNPA Archaeologist will need to monitor the work in respect of fulfilment of the planning condition. The SNPA Archaeologist must be advised of the start date for archaeological mitigation works. Regular communication (eg brief weekly update by email) and site visit(s) should be arranged between the SNPA Archaeologist and the archaeological contractor.

#### 7. Archive Arrangements:

7.1 The paper record should be deposited with the RCAHMW, artefacts and ecofacts should be deposited with a suitable repository, to be discussed with the landowners.

7.2 See <u>http://www.archaeologyuk.org/archives/Archives\_Best\_Practice.pdf</u> for guidance on archive preparation.

#### 8. Dissemination and Outreach:

- 8.1 A note should be prepared for publication in Archaeology in Wales or other journal as appropriate.
- 8.2 Arrangements should be made for at least one public event associated with the work, a talk on the results of the project in Hen Felin community centre, Abergwyngregyn, on completion of the work is suggested.

#### 9. Access Arrangements:

9.1 Arrangements for site access should be made through?

#### **10. Insurance:**

10.1 Contractors must hold Public Liability Insurance with a minimum indemnity level of £.......... (Contractor to advise cover level), for each and every claim for up to 12 months after the completion of work.

10.2 Contractors must hold Employers Liability, if relevant, of £..... (Contractor to advise cover level)

10.3 It is recommended that Contractors hold Professional Indemnity Insurance with a minimum indemnity level of £...... (Contractor to advise cover level) for each and every claim up to 6 years after the Contractor completes their services.

#### 11. Health and Safety:

- 11.1 It is the responsibility of the Contractor to take all reasonable steps to ensure the health and safety of themselves, their staff and members of the public.
- 11.2 The contractor should have in place an effective Health and Safety Policy.
- 11.3 Contractors should comply with the requirements of the Health and Safety at Work Act (1974) and the Management of Health and Safety at Work Regulations (1992).
- 11.4 A risk assessment should be prepared in advance of the commencement of the project.

#### 12. Copyright and Intellectual Property:

12.1 The copyright in all documents, reports, notes, drawings and similar material provided by the contractor in connection with the Project shall vest in YAE.

#### 13. Scope of Works

#### National Trust Land: Intake to NRW Forest Boundary

• Feature 18: The intake is about 30m downstream of the sheepfold structures, with no easy access to it. There is no possibility or reason for the contractor to go into that area; hence no measures are required here. The civil contractor has been made aware of the necessity of staying within the agreed working corridor and agreed storage compound areas.

- Feature 2: Track way: Intensive Watching Brief (IWB) required from intake to this track, also of adjacent construction compound 1.
- Feature 3: Hut circles. The pipe route passes at least 8-10m away from these structures however there is a possibility of uncovering archaeological finds in the nearby area which the pipe route crosses. Posts and temporary tape will be used to mark off these features and an IWB will be required over the area local to these hut circles as shown on the map, to extend from feature 15 to a point approximately half way between features 15 and 4/5.
- Feature 15: Hut Remains. The grid reference in GAT report is wrong. Our digital terrain survey identified the location of the hut remains as shown on the map, well to one side of pipe route. The structure will be marked off by temporary posts and tape to ensure there is no accidental intrusion. An IWB will be required in the area local to this hut.

The sections of pipe route that require an IWB associated with features 2, 3 and 15 are indicated on the map by the blue clouded areas.

- Features 4 and 5: The pipe route working corridor is 45m away (and uphill) from the nearest of these. There is also a significant amount of slumped material/hill wash in this area. No measures are required here.
- Wall remnants near NRW forest boundary. A photographic record is required prior to works commencing in this area together with an IWB during excavation. The disturbed wall remnants are to be replaced by the civil contractor to match the existing form as closely as possible.

#### **NRW Forestry**

The pipe will be installed in the side of the drainage ditch on the south side of the forestry track. This whole area has already undergone major disturbance during the installation of the forest track and subsequent ditch and track maintenance operations and it therefore considered quite unlikely that any intact remains will be found. Nevertheless, some localised area IWB is proposed around the following features.

- Feature 17: Boundary wall. IWB as pipe route passes across this location.
- 22: Sheepfold and PRN341: IWB in this area to cover these two features, as shown by blue clouded area on map.
- 16: GAT report advises no impact, no mitigation. It is far enough away to be avoided.
- 8: Hut circle: The pipe is in the side of the ditch and on the opposite side of the track from this feature. Localised IWB to be carried out in this area as shown by blue clouded area on map.

#### NRW Coedydd Aber NNR

A watching brief is required on the pipe trench and footprint of the power house plus any associated ground disturbance activity in the vicinity (compounds, outflow pipe, electricity cable connection etc.) within the Coedydd Aber NNR once leaving the forest boundary).

### Appendix 4:

### Specification for Archaeological Watching Brief on the Anafon Hydro Scheme, Afon Anafon.

SNPA Planning Ref. NP3/10/110 Specification written by I.P. Brooks 22/01/2015

- 1. Background
- 1.1. Ynni Anafon Energy Cyf intended to construct a Hydro Electricity Scheme within the valley of the Afon Anafon between SH 68895 71030 and SH 66340 71840. Part of the route is through the open land, owned by The National Trust as part of its Carneddau Estate, whilst the remainder of the pipeline will be constructed through woodland owned by NRW.
  - 1.2. An archaeological assessment of the route was carried out in 2013 by the Gwynedd Archaeological Trust (GAT Report 1135), which included a desk-top study and walk-over survey of the proposed route.
    - 1.2.1. This report recommended an intensive watching brief on a number of locations along the proposed route.
  - 1.3. This specification is based on the brief written by K. Laws (National Trust Archaeologist) and J. Howarth dated 8<sup>th</sup> January 2015.
- 2. Aims
  - 2.1. To provide an archaeological watching brief for the Anafon Hydro Electric Scheme which allows the preservation by record of archaeological deposits, the presence and nature of which could not be established in advance of ground disturbance works.
  - 2.2. To establish and make available information about the archaeological resource existing on the site
- 3. Mitigation Program
  - 3.1. The programme of works shall include:
    - 3.1.1.A watching brief on all works between from the intake and a point approximately half way between features 15 and 4/5 to include the construction compound adjacent to feature 2.
    - 3.1.2. The photographic recording of the wall between the land owned by The National Trust and NRW.
    - 3.1.3.A watching brief of the area around the boundary between the land owned by The National Trust and NRW.
    - 3.1.4.A watching brief where the proposed route crosses boundary wall (feature 17) within the forestry area.
    - 3.1.5.A watching brief in the area of the sheepfold (feature 22) and the possible hut circle recorded as PRN341
    - 3.1.6.A watching brief within the area of the hut circles recorded as feature 8.
    - 3.1.7.A watching brief on the works associated with the construction of the power house including any associated works.
    - 3.1.8. Analysis, report preparation and archiving.
- 4. Methodology

#### 4.1. Watching Brief

- 4.1.1. The watching Brief will follow the standards laid out in the Chartered Institute for Archaeologists. 2014. *Standard and guidance for an archaeological watching brief. Other Standards and Guidance documents of the CIfA (e.g. excavation, archives, finds) will be followed as required.*
- 4.1.2.Both the removal of the topsoil and the excavation of the pipe trench will be subject to an intensive watching brief
- 4.1.3.A suitably qualified archaeologist will be present during all earth moving activities within the areas identified above
- 4.1.4. The level of response to any archaeological features or deposits encountered will initially be assessed by the archaeologist carrying out the mitigation works. If any features or deposits are considered to be significant enough the National Park Archaeologist will be informed.
- 4.1.5. It is intended that the archaeological works will cause minimal delay to the project, however if significant features or deposits are encountered it may be necessary to stop the construction work, in that section, so that a suitable scheme of works can be initiated in discussion with the National Park Archaeologist.
- 4.1.6. In the case of unexpected finds being made by the contractors, between monitoring visits, the archaeologist will be available by telephone and will respond with an appropriate action.
- 4.1.7.All features or archaeologically significant deposits revealed by the ground works will be fully recorded including:
- 4.1.8.A written description of deposit: type, components etc.
- 4.1.9. Drawn plans and elevations at suitable scales
- 4.1.10. Photographs will be taken with a Nikon D80 Digital SLR Camera at a resolution of 10.2 MP in RAW, subsequently converted to TIFF and JPEG for archiving and presentation.
- 4.1.11. The photographs will include metric scales
- 4.1.12. All artefacts and ecofacts will be recorded by context.
- 4.1.13. Each deposit, feature or layer will be identified by a unique context number to which all other records will be related
- 4.1.14. Plan drawing showing extent of deposit.
- 4.1.15. Elevation drawing of the trench sides to record vertical stratigraphy.
- 4.1.16. Where possible, features will be sampled to obtain dating and functional evidence.
- 4.1.17. Where possible, elevation drawings of feature half sections to record vertical stratigraphy.
- 4.1.18. Where appropriate, deposits will be sampled for environmental, dating or technological evidence. Samples will be fully recorded and packed appropriately for future analysis.
- 4.1.19. Sampling will be carried out in accordance with the procedures outlined in English Heritage. 2011. *Environmental Archaeology. A guide to the theory and practice of methods, from sampling and recovery to post-excavation.*

- 4.1.20. All features recorded will be tied in to the Ordnance Survey National Grid.
- 4.1.21. All features revealed by the trenching will be recorded as above if safe working practices allow.
- 4.1.22. If human remains are encountered all works will stop until the appropriate permissions have been obtained.

#### 4.2. Finds

- 4.2.1. Any flint artefacts will be studied by I.P. Brooks for Engineering Archaeological Services Ltd.
- 4.2.2. Any pottery will be studied by an appropriate specialist to be agreed in consultation with the Curatorial Archaeologist
- 4.2.3. Any metal or other special finds will be studied by an appropriate specialist to be agreed in consultation with the Curatorial Archaeologist
- 4.2.4.All ceramic, bone and stone artefacts will be cleaned and processed immediately following the watching brief.
- 4.2.5.Metal artefacts will be stored and managed on site according to the UK Institute of Conservation Guidelines.
- 4.2.6. Any samples taken for environmental analysis will be assessed and studied by an appropriate specialist to be agreed in consultation with the Curatorial Archaeologist
- 4.2.7.All finds will be bagged by context with the exception of closely datable or "special" finds which will be recorded with a 3 D position and will be bagged separately
- 4.2.8. The requirement for specialist archaeological reports will be discussed with the National Park Archaeologists. The extent and cost of any such report will be discussed with the client and a suitable level of response formulated in discussion between the Archaeologist, The National Park Archaeologist and the Client

#### 5. Reporting

- 5.1. A summary report on the findings of the investigations will be prepared and completed on the project including;
  - 5.1.1.A non technical summary
  - 5.1.2.Introduction
  - 5.1.3. Aims and objectives
  - 5.1.4. Methodology
  - 5.1.5. Archaeological Results
  - 5.1.6.Copies of drawings
  - 5.1.7.Copies of photographs
  - 5.1.8.Conclusions
  - 5.1.9. Recommendations for further work
  - 5.1.10. Appendices
  - 5.1.11. References and bibliography

- 5.2. Copies of reports will be sent both to the client and the curatorial archaeologists
- 5.3. An archive will be prepared consisting of plans, photographs, written material and any other material resulting from the project which will be lodged with a suitable archive which will be agreed with the SNPA Archaeologist. This archive will follow the recommendations of the Chartered Institute of Archaeologists Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives

#### 6. Monitoring

6.1. Procedures will be put in place to facilitate the monitoring of this project by the Archaeologist, Snowdonia National Park Authority, which will include the notification of any works undertaken and any significant finds or discoveries made during the project.

#### 7. General

- 7.1. IFA Code of Conduct
  - 7.1.1.All staff will abide by, and all procedures be carried out in accordance with the Institute for Archaeologists' Code of Conduct.
- 7.2. Health and Safety
  - 7.2.1.EAS Ltd adopt and adhere to safe working practices at all times. A copy of the company's general statement of policy is available on request.
- 7.3. Staff
  - 7.3.1. The project will be directed by Dr I.P. Brooks MIFA
  - 7.3.2. Project Staff will include Dr I.P. Brooks MIFA
- 7.4. Timetable
  - 7.4.1.It is not possible to estimate the time required for the watching brief as this is dependent on the construction timetable. An archaeologist will be available when works require.
  - 7.4.2. The Archaeologist will be on site to conduct the watching brief during all intrusive/ground disturbing works at the identified locations.
  - 7.4.3.Analysis and report preparation is dependent on the results of the fieldwork.
- 7.5. Insurance
  - 7.5.1.EAS Ltd carries all necessary Public and Employee Liability Insurances.
  - 7.5.2.EAS Ltd carries Professional Indemnity Insurance.
- 7.6. Copyright
  - 7.6.1.EAS Ltd shall retain full copyright of any commissioned reports, tender documents or other project documentation, under the Copyrights, Designs and Patents Act 1988 with all rights reserved: excepting that it hereby provides an exclusive license to the client for the use of such documents by the client in all matters directly relating to the project as described in the Project Specification.
  - 7.6.2.EAS Ltd is prepared to assign copyright at the request of the client.
  - 7.6.3. Liaison with regional HER
  - 7.6.4. The regional Historic Environment Record (maintained by Gwynedd Archaeological Trust) will be contacted prior to any post-fieldwork analysis commencing for:

- 7.6.5. Any PRN (primary record number) identifiers required and
- 7.6.6.To discuss compatibility of any outputs (databases, spreadsheets, image and document archives) with the Historic Environment Record.

#### 7.7. Archive

- 7.7.1.The full site archive will be deposited within one month of the completion of the client report.
- 7.7.2. The site archive will be prepared in accordance with The Management of Archaeological Projects 2, Appendix 3 (English Heritage 1991). It will comprise all the data recovered during the fieldwork and shall be quantified, ordered and indexed and will be internally consistent. The archive will be deposited with the finds in a suitable local museum.
- 7.7.3. The paper/drawing/digital archive will be deposited at a location to be agreed with the SNPA Archaeologist (probably the regional Historic Environment Record) while the finds will be deposited with the appropriate local museum.
- 7.7.4. All digital images will be stored in archive stable format, i.e. TIFF format, on digital optical disc. A contact sheet and photo record will also be contained within the archive corresponding to the images on disc.
- 7.7.5. Digital copies of the report, all correspondence and scanned images will also be stored on digital optical disc. This will include all digital project files e.g. databases, spread-sheets, word-processed documents, graphic files, CAD/GIS files and equivalent etc.
- 7.7.6. The archive will include all site notes, finds, documents, drawings, photographs, digital data and a copy of the final report and any prior draft versions. All of these items will be clearly quantified in tabular from in an 'archive deposition statement' located at the rear of the clients report, and their ultimate location and proposed date of deposition stated.
- 7.7.7.The storage location will be decided after discussion with SNPA Archaeologist.
- 7.8. Reporting
  - 7.8.1.The results of the work will be submitted in an illustrated and bound report, which will include the following material:
  - 7.8.2.A non technical summary
  - 7.8.3.An introduction to the project
  - 7.8.4. The aims and objectives of the works
  - 7.8.5.The methodology adopted
  - 7.8.6.A description of any archaeological features of deposits recorded during the watching brief
  - 7.8.7.Plans and section drawings at suitable scales
  - 7.8.8.Copies of photographs taken to illustrate the results of the watching brief
  - 7.8.9.Conclusions
  - 7.8.10. Recommendations for further work
  - 7.8.11. Appendices
  - 7.8.12. References and bibliography

- 7.8.13. A detailed archive list at the rear listing all contexts recorded, all samples finds and find types, drawings and photographs taken. This will include a statement of the intent to deposit, and location of deposition, of the archive.
- 7.9. Dissemination
  - 7.9.1. In addition the copies required by the Client, hard copies of the reports will be sent to The Snowdonia National Park Authority (2 copies), The Regional Historic Environment Record held by the Gwynedd Archaeological Trust and the Royal Commission on the Ancient and Historical Monuments of Wales. These bodies will also be sent digital copies of the report together with the archive on optical digital disc.
  - 7.9.2.A paper will be prepared for submission to Archaeology in Wales outlining the results of the watching brief
  - 7.9.3.A talk to the local community will be offered on the completion of the project.