CPAT Report No 1033

Mines and Quarries

The Scheduling Enhancement Programme

THE CLWYD-POWYS ARCHAEOLOGICAL TRUST

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March 2010

Report for Cadw

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Cover photo: Ogof Wyddon and the surrounding landscape (photo CPAT 3041-0002)

The Scheduling Enhancement Programme: Introduction

In the second quarter of the financial year 2007/8, a scoping study was conducted at the request of Cadw which identified in overall terms the number of sites and features recorded in the regional Historic Environment Record (HER) that might still need to be assessed in order to complete the scheduling enhancement programme for prehistoric and Roman sites in the region, taking the study from the earliest times through to around 400 AD. It was needed to inform their thinking on priorities for scheduling enhancement in the two years up to April 2010 which at that time was the projected date timetabled for when the provisions of the Heritage Reform White Paper were to be implemented.

The scoping report was submitted to Cadw in September 2007 and was discussed at a meeting of the trusts' directors and Cadw on 3 October. This was followed by a further meeting between the trusts and Dr Mike Yates on 7 November, as a result of which some preliminary work on a general scheduling enhancement programme across the whole of Wales was conducted by some but not all trusts during the remainder of 2007/8. All four trusts are currently involved, at the time of writing, in this programme, with a view to completing it by the end of the financial year 2009/10.

A series of enhancement programmes had already taken place during previous years across Powys and the former county of Clwyd, in some cases going back into the early 1990s, to study thematically a range of monument types including: unenclosed prehistoric settlements identified through their lithic concentrations (2001-2), prehistoric funerary and ritual monuments (from 1997 until 2005/6 with follow-up programmes in three subsequent years), hut circles/round huts (from 1998 to 2008), defended enclosures of Iron Age and Roman date (in 1993, 1995, 1998 & 2006 to 2008) Roman military establishments (2004 to 2008), and Roman roads (2002 to 2004 with follow up work as a result of the projected revision of Nash-Williams and Jarrett's *Roman Frontier in Wales* volume). Such enhancement programmes were designed not only to identify sites which held sufficient potential to qualify them for scheduling as sites of national importance, but also to undertake a rationalisation of the HER, through the validation of authentic sites and rejection of spurious examples, the amplification of existing records as necessary, and the removal of duplicate records.

The scoping study in 2007 utilised a recent extract from the HER to identify: a) all sites and features of prehistoric and Roman date and b) all recorded examples of specific site types such as 'enclosure', 'pound', field system' and the like where the period had been defined as 'unknown'. Sites already assessed during the enhancement programmes of previous years were then removed from this database. Similarly, sites which had nothing better than a four-figure grid reference were removed in the belief that there was no realistic prospect of identifying any such site on the ground, an approach paralleling that followed by the Glamorgan-Gwent Archaeological Trust.

The study identified over 1600 sites (or cultural heritage assets to use the current phraseology) across Powys and the former county of Clwyd where assessment might be useful. In some areas of east and north-east Wales, concentrations of various types of site suggested that a geographically defined approach might be a more efficient mechanism for assessment, subsequent examples including areas such as the Black Mountains in the old county of Breconshire and the Severn Valley in Montgomeryshire. In contrast, there were also specific site types that had not been incorporated into earlier scheduling programmes and which would be better assessed as a group, relevant types including such monuments as burnt mounds, field systems including pit alignments, and caves. Mines and quarries were a class of site which fell into the latter category.

Table 1: Occurrence of specific site types against geographical areas

Area	*Black Mounts*	*Brecon Beacons*	*Clwyd-ians*	*Elan Valley*	*Epynt*	*Mynydd Hiraethog*	*Severn Valley*	*Tana Valley*	*Vale of Clwyd*	*West Monts uplands*
Site type										
Burnt mounds		■			■					■
Caves		■	■						■	
Mines and quarries										
Cairnfields	■	■		■						
Enclosures	■	■	■		■	■	■	■	■	■
Field systems	■	■		■		■	■	■		
Roman settlement							■			
Roman religious sites									■	

Five research objectives, common to all the scheduling enhancement projects, were identified in the proposals for grant-aid submitted to Cadw in their final version in March 2008. These were in order:

a) an assessment of the archaeological significance of the various site-types and the sites that comprise them, within both the regional and particularly the national framework.
b) the identification of those sites that might merit further examination though ground survey, geophysical survey and evaluation.
c) the recommendation of future management strategies, specifically scheduling.
d) the enhancement of the regional HER and through it the Extended National Database (END) maintained by the Royal Commission.
e) the dissemination of information through publication if appropriate.

Particular emphasis in this study was placed on objectives a), c) and d).

SEP Methodology

The preliminary stages of the mines and quarries study were wholly desk-based, involving defining and checking the integrity of the database, assessing the authenticity of the remaining, unscheduled sites and features within it, and establishing which, if any, sites might merit a field visit which in turn might lead to a scheduling recommendation. A basic assumption from the commencement of the project was that no site would be recommended for statutory designation without a field visit being undertaken as a preliminary, an assumption that has underpinned all of the Trust's Scheduling Enhancement Programme studies (SEPs) to date.

An up-to-date extract from the HER was initially provided by the curatorial section of the Trust, and with this as a base, the nature of the potential resource of relevant sites in north-east and east Wales was identified.

The number of sites of potential interest which were identified in the HER came to almost 11,000 records, an extremely large number in comparison to all previous scheduling enhancement projects.

Fortunately, in terms of the time available, only a very small proportion of these were relevant to this study, as discussed below. Table 2 graphically demonstrates the comparative numbers against other recent projects.

The initial stage of the assessment focussed on the removal of all sites and features that could be readily attributed to the post-Roman era (i.e. from the Early Medieval through to the 20th century); this made a significant difference to the numbers of sites and left just under 2,100 records. From the remainder, a further 332 scheduled monuments and 49 listed sites were removed. As in other recent projects, it should be noted here that the number of statutory designations is not necessarily as precise as it might be because there may be recently designated sites which have yet to be registered as such in the HER.

Table 2 Current state of research on the Scheduling Enhancement Programme 2009/10

Theme/area		HER record numbers	Records assessed	Finds	Records enhanced	Records: minor changes	Site visits	SAM recs.
Vale of Clwyd	CPAT Report 948	726	168	99	25	6	8	0
Roman Settlement	CPAT Report 963	51	41	313	13	12	1	1
Roman Religious Sites	CPAT Report 964	25	21	0	12	7	2	0
Brecon Beacons	CPAT Report 982	1317	485	71	51	37	108	8
West Montgomeryshire	CPAT Report 983	376	254	3	19	14	4	1
Elan Valley	CPAT Report 1004	1864	431	23	28	49	47	5
Mynydd Hiraethog	CPAT Report 1009	2056	184	54	32	6	22	0
Black Mountains	CPAT Report 1031	4384	626	168	170	83	144	3
Severn Valley	CPAT Report 1032	4703	771	115	96	62	29	0
Mines and Quarries	**CPAT Report 1033**	**10923**	**1717**	**1**	**9**	**40**	**8**	**3**

Just over 1,700 sites and other assets remained, still a large figure for this type of project, but it was possible to remove a further 220 or so which were obviously not relevant to the study, the vast majority of these being features related to peat cutting and storage. This still left a sizable resource of possible sites, but out of these a significant number had already been covered in the Clwyd and Powys metal mines projects undertaken by CPAT in the early 1990s and, except for six sites which seemed to have a significant prehistoric or Roman component that had not been fully explored, it was not relevant to re-assess these. Once a further 15 sites, which had already been examined during other projects such as Deserted Rural Settlements, prehistoric funerary and ritual monuments, and the recent Severn Valley SEP project, were removed the total had been reduced to a mere 25 sites which were considered in greater detail. Minor changes were made to a similar number of sites that were not relevant to the study, where further evidence was obtained during the course of the assessment process.

The Assessment

The metal mines of the study area belonging to all periods have been the subject of previous grey literature reports by CPAT (Walters 1993; Frost 1993); the work being subsequently amalgamated into a publication on the metal mining landscapes of the area (Jones, Walters and Frost, 2004) which collectively detailed the origin, function and surviving features of the mines in some depth. This work provides a very useful background to the present study, and has led to the statutory designation of a number of mine sites, but its focus was chronologically wide-ranging in that much of the work was undertaken on mines which were predominantly post-medieval in origin or utilisation. It also needs to be borne in mind that the focus of this study is on all extraction sites of prehistoric or Roman date, and that no similar work exists for non-metalliferous mines and quarries.

Prehistoric quarrying is something which is very difficult to identify in the context of this study, but there can be little doubt that it has taken place within the area. The reasons for this contention are twofold; one is that there is a particular class of stone axes which were created from material found only in a small area of the district at Hyssington, near Churchstoke, where recent work by CPAT has focussed on the examination of potential quarry sites. This is the subject of a programme of work funded by Cadw and undertaken in co-operation with the National Museum of Wales, and has been reported on elsewhere. The other is the appearance in mesolithic contexts in North Wales of a particular type of black chert which is found in the Carboniferous Limestone beds near Prestatyn. Although it cannot be confirmed that this was won by quarrying, as there are no definite sites, it is perhaps reasonable to assume that it was taken by simple methods from surface exposures of this material.

Another type of quarrying which no doubt occurred, although it is now almost impossible to define, relates to the extraction of clay for the creation of ceramic vessels and objects. In most cases, it would presumably have been on such a small scale that the workings are indistinguishable from the natural topography, and also these are likely to be in low-lying areas where suitable clay deposits created by fluvial or fluvio-glacial action are readily available. There is, however, one known example of a pit (PRN 35080) at Brecon Gaer in southern Powys, which it is believed to have supplied clay for Roman military use. Cleaning and recording of part of the section of a mechanically excavated wildfowl pond outside the south-east corner of the fort revealed a possible claypit partially refilled with organic material and fragments of Roman pottery and glass. The pottery was predominantly Antonine (2nd century AD) in date. That local clay extraction was a feature of Roman military activity is confirmed by the presence of a brick and tile kiln within the annexe of the fort at Caersws, the products presumably intended for use within the fort and its immediate environs.

A significant proportion of the evidence for prehistoric metal mining seems to belong to the Bronze Age, when sources of copper were exploited for the manufacture of artefacts, tools and weapons. Known sites of the period include Nant yr Eira in western Montgomeryshire and, just outside the study area, the mines at Cwmystwyth in northern Ceredigion and at the Great Orme, near Llandudno. One of the features of Bronze Age mines is the presence of large numbers of hammerstones which were used in breaking rock, probably in association with the practice of fire-setting, a method of loosening rock faces by their alternate heating and cooling. Bone and antler tools were also used when the materials were softer and easier to excavate, and it is normally the presence of an assemblage of some or all of these tools in the spoil tips and workings that is used to identify a mine of Bronze Age date. As an example, there is a report dating from the 1920s of hammerstones along with charcoal and burnt stone from fire-setting on spoil tips next to a narrow open working at the Nantyricket mine, 9km west-north-west of Llanidloes, although sadly there is little of the mine site that has survived later disturbance and its origin therefore remains unconfirmed. In the Iron Age, the tools were perhaps rather more effective but were probably still used in conjunction with fire-setting; it took the advent of gunpowder and rock drilling in the post-medieval period to allow for the relatively rapid creation of underground passages. The difficulty inherent in using the early mining tools meant that methods were used which minimised the amount of rock to be removed, particularly when the mineral veins were followed underground;

there was none of the large-scale exploratory driving of levels to intersect possible mineral veins which became a feature of mining in the 19th century.

Plate 1: The early opencut at Ffos-y-bleiddiad, near Abergele (Photo CPAT 3041-0003)

Mine workings in the prehistoric period were no doubt subject to rather different influences than the large-scale industrialised workings of the 19th century, in that the products from early workings would possibly have benefited entire communities rather than groups of individuals. These workings would have been of significant value to those exploiting them and it seems reasonable to suggest that this could have led to concentrations of population, not merely to work the deposits but to protect them from neighbouring groups or extraction by unauthorised individuals.

In some cases, it is possible to identify mines which are potentially associated with settlements, the most significant example being Llanymynech Ogof, in northern Montgomeryshire, which falls within the largest hillfort in Wales. The underground workings here are of particular interest as, to date, no evidence of the hammerstones which are so characteristic of Bronze Age mining have been found and it therefore seems more likely that they are of Iron Age and early Roman date, particularly as they appear to have become disused by the 2nd century AD, when they were utilised for the deposition of a coin hoard and also became a place of burial (Jones, Walters and Frost, 2004, 12). Open workings which are very probably of similar date extend for at least 250m to the north, west, and south-west from the known mine and the antiquity of these workings is further suggested by evidence of smelting dating from the 1st and 2nd centuries BC which has been uncovered during excavations carried out in widely-spaced parts of the fort over the years (Jones, Walters and Frost, 2004, 11). The mine workings within the hillfort, both on the surface and below ground, would undoubtedly benefit from further investigation, but, even with the present state of knowledge, it is tempting to see the hillfort and mine workings as a coherent entity providing and defending a resource of great value to the inhabitants.

The same reasoning can be applied to the Roman period, where the evidence suggests that settlements in close proximity to mine workings were either initiated or expanded, good examples being those at Ffrith, near Wrexham, and Prestatyn on the coast of North Wales. Perhaps these were initially of a military character, something suggested by the presence of stamped roof tiles relating to the XXth legion at Prestatyn, and perhaps rather more directly by the close proximity of a Roman fortlet known as Penycrocbren to the early workings at Dyfngwm/Castle Rock, 12km north-west of Llanidloes in north-west Montgomeryshire. It has to be borne in mind, however, that the presence of items manufactured by the military is not necessarily evidence of direct Roman military occupation of a site, it may instead be evidence of a trading network, and in this regard it is interesting that two lead ingots bearing the name of the tribe which inhabited the north-east of Wales have been found near the legionary fort at Chester. Speculatively, this could represent the continuation of an earlier local tradition of lead extraction which was taken under Roman control following the conquest of the area in the 1st century AD.

Two obvious candidates for mines which might have provided the lead that forms the Chester pigs are Ffos-y-bleiddiad, where there is a large opencut (Plate 1) of early date, in close proximity to the Iron Age hillfort of Castell Cawr, and Graig Fawr, near Prestatyn (Plate 2), a hill that became part of the mines at Talargoch, which were heavily mined during the post-medieval period. Finds of Roman date were made in the latter mines from the 18th century onwards, strongly suggesting that some of the workings go back at least that far in date, and some of these (see Plate 2) certainly have an early appearance. It might be suggested that some analysis of the mineral compositions of these and other lead pigs found in the district, in relation to the known lead deposits, would be a worthwhile exercise.

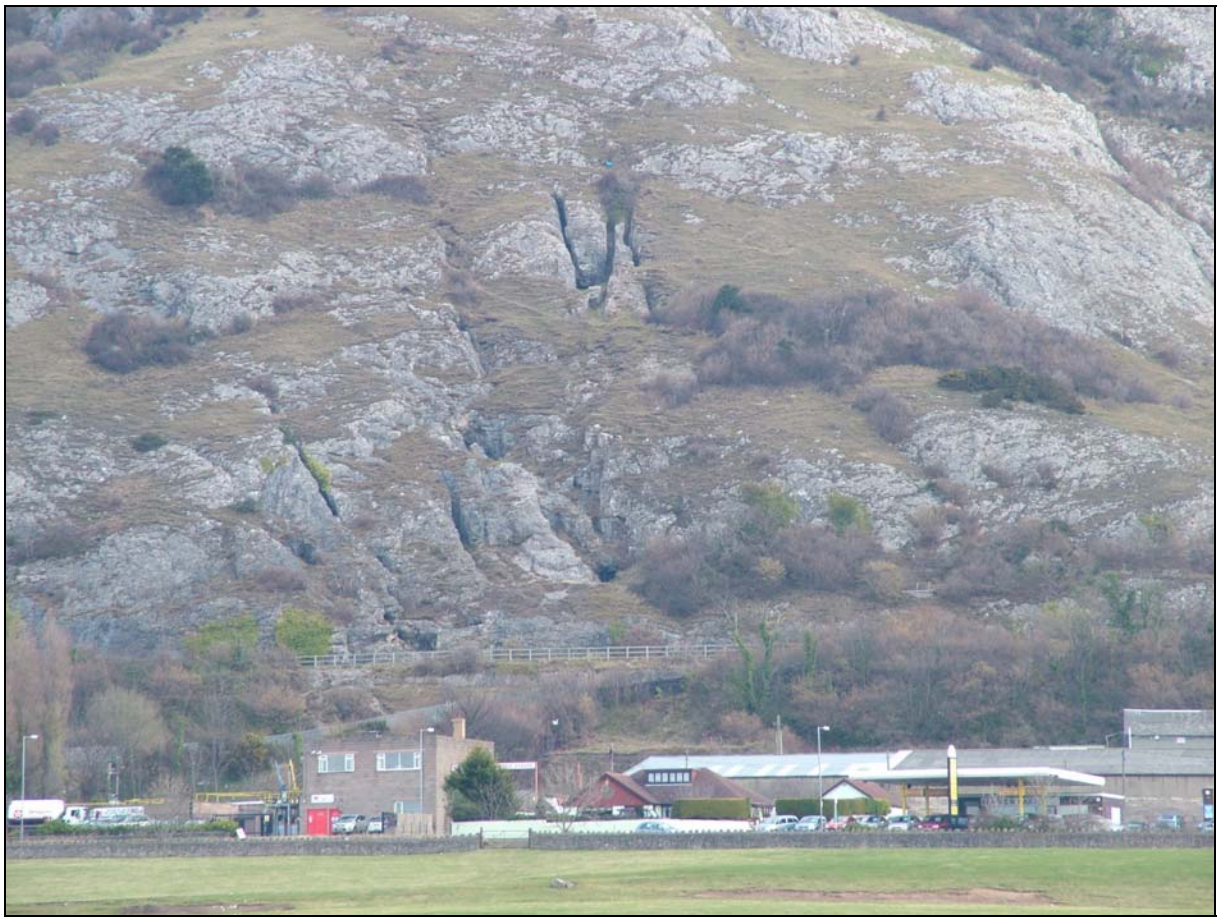


Plate 2: The narrow opencuts on Graig Fawr hill, near Prestatyn (Photo CPAT 3041-0013)

The presence of Roman mining activity in mid-Wales has already been highlighted by evidence of workings at Llanymynech, where copper seems to have been the main mineral mined. It is also evident that lead was exploited in the district as a number of Roman smelting sites have been identified in the past. Interestingly, but also problematically, the smelting seems to have been separated from the sources of ore, as evidence has been identified at Caersws, Trefeglwys and Llanfyllin, all of which are some distance from the nearest likely source of supply (Walters 1993, 9). Nevertheless, these sites provide a background against which a search for likely mine sites can be made.

The Roman settlement at Prestatyn perhaps illustrates the complexity of the situation regarding the potential for metal ore extraction sites of prehistoric and Roman date in North-East Wales. The excavations carried out there between 1980 and 1985 (Blockley *et al*, 1989) revealed an Iron Age farmstead which was supplanted by a Romano-British industrial settlement involved in the manufacture of a variety of metal objects. A significant quantity of ceramic moulds were recovered and at least three buildings, dating from the late 1st century to the mid-2nd century, were identified as bronzesmith's workshops. It is thought that lead was also being processed, as trumpet brooches were one of the types being produced and this would have been needed for the niello inlay (Blockley *et al* 1989, 34). Even this is not the end of the story, as quantities of haematite (iron oxide) powder and fragments were also found in the workshops; this material would have been readily available on Moel Hiraddug (Plate 3) , only 3km to the south, where it appears to form a secondary deposit infilling old cavities in the limestone.

Plate 3: Haematite deposits in the quarry at the north end of Moel Hiraddug, with Graig Fawr hill and the town of Prestatyn visible to the upper left of the image. (Photo CPAT 3041-0011)

There is a marked discrepancy between the number of identified prehistoric and Roman mine sites in mid-Wales and those in north-east Wales, particularly when these are compared to the total of known

mine sites from all periods for the two areas. This is graphically demonstrated by the following table, and merits further consideration. It was also evident that there was a similar under-representation of scheduled sites in the latter area, again highlighted by the table.

Table 3 Relative numbers of scheduled and unscheduled mine sites in the study area

	No of mine sites (total scheduled)	Mine sites with a Prehistoric or Roman connection	
		Confirmed (scheduled)	Alleged (scheduled)
Mid-Wales	76 (10)	5 (3)	12 (1)
North-east Wales	330 (6)	0	3 (1)

The reason that so few prehistoric and Roman mines have been identified in north-east Wales is rather difficult to fathom, given that mining is known to have been carried out at the Great Orme, only a short distance away, during the Bronze Age and later periods. There are, however, a number of factors which may combine to explain the difficulties inherent in their study, the first of which is the presence of large-scale industrial working in the area from the 19th and early 20th centuries, something facilitated by good access and shipping routes. Unfortunately, this has no doubt masked or removed much of the more easily gained evidence for early mining, such as the presence of datable artefacts and the morphology of the workings. The associated industrialisation of the area has also led to greater concentrations of population, with the resulting pressure to reclaim areas of waste ground for settlement and agriculture, again activity which often leads to the masking or removal of evidence for early working. In contrast, the mines of mid-Wales are generally rather more remote from areas of settlement and have not been subject to the same pressures, either when they were in use, or after their abandonment, and the relative ease of their identification is probably the main reason for the results in the above table.

A further bias is that the minerals in North-East Wales were probably of more use in the Iron Age and Roman periods, when the production and use of lead was of major economic value. It is reasonable to assume, from the evidence produced by a number of excavations in the area, such as on the Roman building complex at Pentre Farm, Flint, which is thought to be an official residence associated with lead mining in the district, that the activity formed a significant part of the local economy and must therefore have been fairly widespread where suitable deposits were available for exploitation.

The problem comes in defining specific sites involved in this activity, as, in comparison with the easily distinguishable Bronze Age artefacts and processes, the methods and equipment used were not particularly different to those of later periods. It therefore takes detailed examination, both on the surface and underground, to confirm whether a particular site has an early origin. Occasionally, this may be supported by artefactual evidence recovered when the workings were still in use (all are now abandoned), and modern underground examination is also possible in a few cases, although problematic due to the difficulties and dangers of access. There are, nevertheless, some surface signs which can be taken as indicators to define sites of potential, the most significant of which is probably the presence of opencuts, occasionally wide at the surface but becoming narrow as they progress underground (Plate 4). Some care still needs to be taken in their identification, however, and searches should be made for evidence of post-medieval rock drilling. Another significant feature is the presence of workings which are irregular and contract or expand in concert with the shape of the ore body, something which may depend on the nature of the deposits but can also result from the use of relatively inefficient tools when only the minimum of waste material could be removed.

Plate 4: A close-up view of a typical early opencut on Graig Fawr (Photo CPAT 3041-0008)

The other factor highlighted by Table 3 is that only a very small number of the mines in north-east Wales have statutory designations, strange when it is evident that there are over four times the number of mines in the area in comparison with mid-Wales. Perhaps this is due in part to the fact that the mid-Wales mines are generally coherent sites on which a range of extraction and processing activities can be observed within a limited area, while those in the north-east are often rambling collections of workings, difficult to differentiate from adjacent setts, and often subject to damage or loss from subsequent activities of all kinds. This is especially the case in a locality like Halkyn Mountain, which is pock-marked with workings of many periods, but where it is strongly believed that workings had begun by Roman times, mainly as a result of the discovery there of a lead ingot marked with the name of C Nipius Ascanius, a lead producer of the Roman period. It is also true that past work in the north-east has tended to look more at the mines of the 19th century, with perhaps less attention paid to sites which are potentially early, and arguably therefore of greater archaeological interest. Some sites which are potentially relevant to this problem are considered in the gazetteer below, but whatever the reasons, there is little doubt that the north-east deserves further detailed examination in the future and it is hoped that this will reveal more widespread evidence of the early workings which must surely exist in significant numbers, if only they can be identified.

Appendix 1 – Site List ordered by name

Name	*PRN*	*NGR*	*Type*	*Date*
Cwm Orog Mine	5925	SJ05202730	Lead mine	Multiperiod
Ffos-y-Bleiddiaid	18070	SH93527696	Mine (lead/copper)	Multiperiod
Gronant Chert Quarries	102227	SJ0949682795	Quarry	Mesolithic
Llangynog Mine	8433	SJ05502555	Lead mine	Multiperiod
Moel Hiraddug Mine	103489	SJ06307870	Mine (nickel/cobalt)	Multiperiod
Nantyricket Mine	8476	SN86558678	Copper mine	Multiperiod
Ogof Wyddon	8458	SH76050011	Mine (lead/copper)	Multiperiod
Old Roman Hillocks	98681	SJ2028562797	Mine	Medieval ?
Talargoch Mine	17814	SJ06108010	Mine	Multiperiod

Appendix 2 – Gazetteer of authentic sites

5925 Cwm Orog Mine SJ05202730 Lead mine Multiperiod

Old description
Lead/Zinc/Barytes mine (Prehistoric ?/Roman ?/Medieval ?/1747-19th C)

Geology
Ordovician slates, shales and felsites dominate the geology. There is a main ENE-WSW vein with N/S barytes cross-courses. Mineralisation of the main vein includes lead and zinc.

Workings
'Old Workings' were described as being present in 1747. Opencuts and stopes can be seen on the northern slopes of Craig Rhiwarth on the barytes lode & main lode. There are 10 levels in all including adits below the northern scarp of Craig Rhiwarth from SJ05022727 to SJ05272728. There is a single shaft at the top of the hill SJ05272728. Surface workings are visible at the western extent of Pencraig and probably represent early trials for the western extent of the lode SJ04832681.

Transport
There is a 3 phase system which is unique in the Mid Wales orefield including: (1) 2 contour tramways connecting to long oreslides (2) 1 incline tramway (3) An aerial ropeway. The three contour tramways are well preserved as are the ore chutes at their extremes. Only the upper foundation base of the aerial ropeway winder survives. The incline survives as a footpath. Many of the adits display earthwork traces of tramway beds. At the uppermost level entrance remains of rails can be seen.

Power
Two leats from Nant Bryn Mawr lead to the dressing floors. There is a 17 x 2ft wheelpit on the dressing floor with an in situ axle. This waterwheel drove the crusher and buddle.

Processing
There is a crusher house, stone breaker platform, three earthwork settling tanks, a single buddle and a jigger shed all centred on SJ04732736. The ore chutes/bins at the head of each contour tramway are in direct association with washing/picking floors. Each of the ore bins is constructed to a slightly different design.

Conclusions
Although early, probably 17th century workings are located on the northern slopes of the Craig Rhiwarth Hillfort, there is no certain evidence of ancient workings contemporary with the hillfort. Powys Estate manuscripts record mining at Cwm Orog from 1706 (Powys MS 3029, National Library of Wales) and documentary evidence suggests that various trials had taken place with very little success prior to 1751 (Powys MS 21712, National Library of Wales).

New description
There may be some prehistoric mining in this area, a possibility which is suggested by the close proximity of Craig Rhiwarth hillfort and the fact that prehistoric smelting evidence was found in excavations at Llwyn Bryndinas, further down the Tanat valley. (RH 13/01/2010)

8433 Llangynog Mine SJ05502555 Lead mine Multiperiod

Old description
Lead mine (1692-1869)

Geology
The main vein strikes E-W and divides metamorphic rocks to the south and igneous to the north. The vein splits into two branches on the western side. Mineralisation includes galena with gangues of slate and igneous rock together with quartz and copper carbonates.

Workings
There are four levels, six shafts, a number of level trials on the top of the hill at SJ05482559 and opencuts at the top of the quarry which probably mark the position of the earliest workings at SJ05322558. Some shaft-mound trials were noticed in the field immediately west of the dressing floors at SJ05102550.

Transport
No evidence.

Power
Leats running from the watershed to the west fed the reservoir known as Llyn Y Mynydd at SJ00802510 from where leats traversed the hillside down to the dressing floors. Two more storage reservoirs are located on the dressing floors at SJ05502560. A pumping and crushing waterwheel pit formerly existed on the dressing floors but has since been infilled. The foundations of the 1871 engine and boiler house can still be seen in an overgrown plot close to the road at SJ04982565 along with the chimney base.

Processing
All surface evidence of the dressing floor structures has been destroyed by recent quarrying of the area for roadstone. Two poorly preserved round buddles are all that is left and they will probably be destroyed by continuing small-scale removal of stone for local use.

Other features
There is an 18th century magazine above the quarry at SJ05542566 which consists of 2 concentric walls, a single doorway, and windows. A small tree is growing between the two walls on the western side and will ultimately cause collapse. Many local houses nearby are associated with the mine, eg. Ty Newydd (SJ05262555) which dates to 1708 and was used as a mine managers office. Workshops and storerooms are located to the north of Ty-Newydd and are very ruinous (SJ05252560). Evidence of post-medieval bole hill smelting may be demonstrated by the finding of heavy ferrous vesicular slags near the southern extent of the mine close to Rock level at SJ05402553.

New description
Some possible hammer stones were observed in the spoil below the main mine area by the writer in the past. A further stone was apparently recovered from the area of a water tank at the base of the south slope of Craig Rhiwarth (SJ 0554 2640), but the material from around this probably originated in the South Llangynog area. All suggest that there was some prehistoric mining in the area, which is not surprising given the presence of Craig Rhiwarth hillfort and the fact that prehistoric smelting evidence was found in excavations at Llwyn Bryndinas, further down the valley. (RH 13/01/2010)

8458 Ogof Wyddon SH76050011 Mine (lead/copper) Post Medieval

Old description
Geology
Silurian Wenlock-Ludlow series. One vein strikes E-W with a N-S cross vein containing lead and copper ores.

Workings
The main copper working began as an opencast 25m long by 6m wide and is known as Ogof Wyddon or the Witches Cave SH76050011. The opencast has a later shaft through its floor and a connecting adit at its base. The adit has another shaft through its floor. There is a trial level lower down the hill to the east at SH76120008. Curiously there are no obvious spoil tips associated with the mine.

Transport, Power and Processing
No evidence

Artefacts
An iron pick and 'fish spear' together with a stone hammer, which was apparently still hafted, were retrieved from the base of the shaft which cut through the bottom of the opencast during drainage operations in 1856. At the bottom of the shaft there was also a quantity of burnt wood with evidence of burning on the shaft walls. The latter may indicate that firesetting was being used to break up the rock.

New description
Opencast site for copper extraction with documentary evidence for primitive tools having been found at the site (Pickin, J., 1988, 18-19). (info from PRN 17467)

The site comprises a fenced off opencast slot, around 25m long, in the crest of a small rocky hillock, and interconnecting with a similarly fenced off adit to its west-north-west. No waste rock or significant finds are now apparent but it seems that hammer stones have been retrieved from the site in the past. There is some relatively recent rubbish tipping in the east-north-east end of the opencut. (RH 24/02/2010)

8476 Nantyricket Mine SN86558678 Copper mine Multiperiod

Old description
Copper mine (Prehistoric ?/19th century)

Geology
Ordovician grits and conglomerates of the Lower Van Formation with chalcopyrite and calcite veins striking ENE.

Workings
An adit at the rivers edge on the north side of the Severn, probably 19th century in date (SN86708676). A deep narrow opencut on the south side associated with a small processing area and spoil tip close to the rivers edge (SN86658676). A wide opencut north of the present forestry track at SN87158678.

O.T. Jones recorded a deep narrow opencut 200yds east of the main adit known as the 'Thieves Den' where a number of hammerstones are recorded on the spoil tips along with charcoal and burnt stone, presumably from firesetting. This site has not been located.

Transport
An inclined trackway connects the adit to the present forest road above.

Processing
There is some evidence of hand sorting and limited dressing close to the narrow opencut on the south side of the stream.

Other features
A rectangular building of unknown use is located downstream of the narrow opencut on the south side of the Severn at SN86698678. Two internal divisions are visible and it appears to be drystone walled. This structure may be related to farming activity or it may be a small mine office related to 19th century workings mentioned above.

New description
Few traces of the recorded mine are present, with the exception of some stone-built revetments next to the river at its approximate location and some mineralised rock in the riverbed. The area is, however, now very overgrown with trees and difficult to access. It seems likely that the workings on the S side of the river have been filled in or covered by earthmoving related to the construction of the forestry road which runs along that part of the valley. No physical evidence of prehistoric working was found but the nature of the site has similarities with the prehistoric mining at Nant yr Eira, which is only some 3.5km to the W. (RH 24/02/2010)

17814 Talargoch Mine SJ06108010 Mine Post Medieval

Old description
Remains of lead mine including open working and deep mines covering an area around SJ06108010. Later disturbance due to tank training (Latham 1992, 6-7).

Evidence that lead and copper were mined here for a short time in the Medieval period (1303). The mine was then revived in the 1630's, but eventually shut down in 1884. In its final years, Talargoch ranked among the top 10 British mines, but was out of date and inefficient.

Talargoch mine grew in and around the village of Meliden, and the growth of the village has destroyed much of the evidence of mining. Most of the main mine buildings were demolished in the 1960's. (Thorburn, J A, 1986)

New description
Prehistoric find from dressing floors (NW Jones - pers comm)

Disused lead mine said to have been worked in Roman times because of finds of bronze bracelet, wedge, coins and tools - all Roman - found in the mine since 1704 (see PRN 102194). Note the proximity to the Roman settlement at Melyd Avenue in Prestatyn.

The post-medieval area of mining seems to have mainly been on the flat ground below Graig Fawr, where the Clive engine house still stands. Earlier working is signified by a fairly large number of opencuts on the south and east slopes of the hill, but none of these can be directly dated from the visible remains. In terms of the potential for early working, the series of narrow opencuts on the west side of Graig Fawr around SJ 05867 80373 are perhaps the most likely to be significant as they lie on a bare rock outcrop and exploit veins which would therefore have been fairly obvious without any exploratory excavations. Examination of these workings at the surface suggests that they predate the use of gunpowder, although shot holes are present in one or two places where cursory attempts at reworking have been made. Most entrances are now blocked by metal grilles. The potential link between the Roman metal smithing workshops at Melyd Avenue, Prestatyn is also relevant, given that these were less than 1.5km distant. (RH 25/02/2010)

18070 Ffos-y-Bleiddiaid SH93527696 Mine (lead/copper) Multiperiod

Old description
Lead/Copper mine (Roman/Medieval-19th century)

Geology
An east-west vein with north-south strings in Carboniferous Limestone.

Workings
Ffos-y-Bleiddiaid is a natural limestone fissure that crosses the north and coastal side of the hillfort of Castell Cawr. Locally known either as the Fosse of Wolves or the Roman Fosse (Ffos-y-Rhufeiniaid) since it has been claimed that Roman hammers and tools together with the hilt of a Roman sword had been found in the vicinity. The evidence of Roman workings, dating from 19th-century writings remains unsubstantiated.

Working evidence was located in the form of three levels in tiers cutting into the north side of an open-cut slightly off from the main east-west cut. Further west along the main cut, a deep hole veers down, far too steep to investigate thoroughly. The gorge at this point is traversed by a wooden bridge, part of the recent path improvement through the Tan-y-goppa Woods. Access to the entire length of the gorge is restricted by the dense undergrowth and safety fencing, but the whole length is likely to have been worked as open-cuts at a very early period. A single shaft mound remains in a field to the south of Castell Cawr at SJ93807645. A shaft showing on the 1st edition OS map to the south-west of this is no longer visible and the shaft to the north-east on the same vein as the Ffos-y-Bleiddiaid cut, lies under a modern housing estate. The Ffos-y-Bleiddiad cut appears to have been already exhausted of ore by the 19th century.

New description
A mostly natural fissure, 300m long, used in mining during the past. Various shafts can be seen in its base. Reports of Roman material however cannot be validated. [from PRN 106015]

There is absolutely no reason to see the opencut as a natural feature, it is far too regular and focussed on a particular alignment to be anything other than a very large working designed to exploit what is presumably a wide vein system crossing the north end of the hill occupied by Castell Cawr hillfort. At times the opencut attains a width of around 15m, although it is more commonly 5m-10m in width and in places there are traces of exploratory working to either side. There are also some places where the base of the opencut has been extended down into narrow stopes, which are interesting as there are no traces of rock drilling and gunpowder usage at any point. The most potentially significant section of working that was observed lay at SJ 93545 76988, where there was a hollowed-out section of rock face some 3m wide and high with a natural or mined-out area above; the lower part had all the appearances of firesetting.

The condition and appearance of these workings seems incompatible with mining of the 19th century and it is the writer's opinion that these workings may well belong to both the prehistoric and Roman periods. (RH 25/02/2010)

98681 Old Roman Hillocks SJ2028562797 Mine Medieval ?

Old description
Site recorded in former Flintshire SMR. As yet undescribed.

New description
An area described on a 1756 map (Denbighshire record office D/KK/311) as 'Old Roman Hillocks'. There are up to 24 'pits' or ringed hollows, generally set in a line running north-west/south-east. There are also numerous spoil heaps in the area as well as capped and uncapped mine shafts. (Clwyd County Council 1979 - Flintshire SMR)

The area contains a series of ill-defined mounds and surface scoops lying to the north of a limestone ridge/outcrop. They probably represent trial working in the main, but there are also many possible shafts present, at least some of which are likely to be post-medieval in date, and one of which has a shaft mound 3m high. It is impossible to date the workings from their surface appearance, though the 'Roman' appelation generally stands for 'old' in the context of sources similar to that of the 18th century, mentioned above. It nevertheless seems reasonable to assume that some of the workings could well be of at least medieval, and perhaps even earlier date. (RH 25/02/2010)

102227 Gronant Chert Quarries SJ0949682795 Quarry Mesolithic

Old description
Possible source of Mesolithic chert. Long since destroyed by more modern quarry activity, all of which is now disused. Nothing archaeological visible.

New description
The chert from the district is found in various prehistoric contexts, but there are many potential sources as it occurs in beds within the limestone and was presumably won by very shallow surface working, where visible. The more recent quarrying activity at this location was still current in 1872, when the OS 1st edition map (Flintshire 2.10) was produced. The map also shows evidence of former lead mining activity in the immediate locality. (RH 24/03/2010)

103489 Moel Hiraddug Mine SJ06307870 Mine (nickel/cobalt) Multiperiod

Old description
Nickel/Cobalt mine (Early mining-1891)

Geology
Carboniferous Limestone.

Workings
A single shaft appears to the north of Foel Farm on the OS 2nd edition map, being the shaft now evident at SJ06547807. Much of the northern area of the Hillfort has been destroyed by quarrying. Large open cuts and levels appear to run in from the uppermost southern slopes of Y Foel, where several intersections of veins were worked for haematite, nickel, cobalt and pyrites.

New description
A hammer stone was recovered from excavations in the vicinity of the transmitter station which lies at the southern end of the hillfort during an excavation undertaken by CPAT (Thomas, 1993). It had clearly been utilised as it displayed distinctive pitting and spalling at one end and there were some hints that it might have been hafted. Fragments of altered lead ore were also found nearby, but the hill is generally known for its veins of iron and cobalt. Perhaps this is significant, given that iron oxides were found in the Roman bronzesmith's workshops at Melyd Avenue, Prestatyn, some 3.5km distant. (RH 25/02/2010)

The area occupied by the hillfort was examined and revealed a large number of shallow surface workings, with some rather larger undated excavations towards the southern end, seemingly following old cavities in the limestone, which had been infilled with iron-rich deposits, to judge from their irregularity. Viewing of the redundant quarry which has eaten into the north end of Moel Hiraddug revealed a large area of iron-rich rocks (probably haematite), that again seemed to be occurring as the infill of cavities in the limestone. (RH 25/03/2010)

Appendix 3: Scheduling Recommendations

Site Name: **Ogof Wyddon** ***PRN:*** **8458**

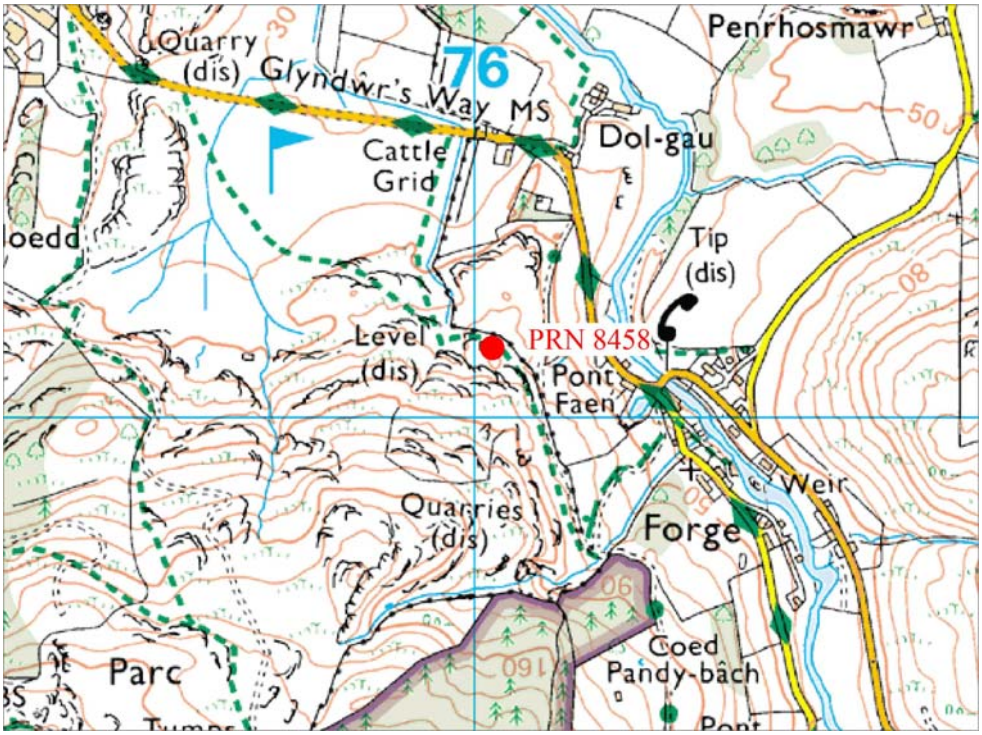
NGR: SH76050011 ***Map:*** SH70SE ***Altitude:*** 75

Type: Mine ***Form:*** Earthwork

Period	*Rarity*	*Documentation*	*Group Value*	*Survival*	*Fragility/ Vulnerability*	*Diversity*	*Potential*
X	X	X		X			X

Mine comprising an east-west vein with a north-south cross vein containing lead and copper ores. The main copper working began as an opencast 25m long by 6m wide and is known as Ogof Wyddon or the Witches Cave. The opencast has a later shaft through its floor and a connecting adit at its base that emerges to the west-north-west. The adit has another shaft through its floor. There is a trial level lower down the hill to the east at SH 76120008. Curiously there are no obvious spoil tips associated with the mine.

An iron pick and 'fish spear' together with a stone hammer, which was apparently still hafted, were retrieved from the bottom of the shaft in the opencast in 1856. There was also a quantity of burnt wood with evidence of burning on the shaft walls. The latter may indicate that firesetting was being used to break up the rock. Nothing significant is now apparent on the surface but it is evident that the mine has an early origin. There is some relatively recent rubbish tipping in the east-north-east end of the opencut. (RH 24/02/2010)



Site Name: **Talargoch Mine (Graig Fawr hill)** ***PRN:*** **17814**

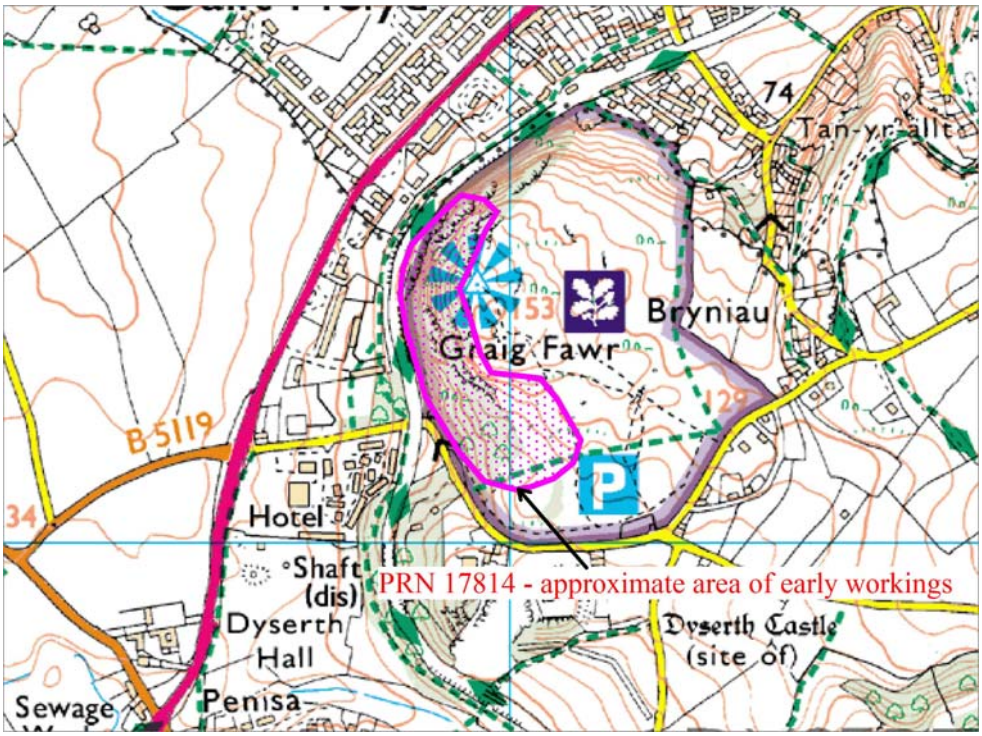
NGR: SJ05878039 ***Map:*** SJ08SE ***Altitude:*** 100

Type: Mine ***Form:*** Earthwork

Period	*Rarity*	*Documentation*	*Group Value*	*Survival*	*Fragility/ Vulnerability*	*Diversity*	*Potential*
X	X	X		X		X	X

Disused lead mine including open working and deep mines covering an area around SJ06108010. It is said to have been worked in Roman times because a bronze bracelet, wedge, coins and tools - all Roman - found in the mine since 1704 (see PRN 102194). There is also evidence that lead and copper were mined here for a short time in the Medieval period. The mine was revived in the 1630s, but eventually shut down in 1884. In its final years, Talargoch ranked among the top 10 British mines, but was out of date and inefficient. Most of the main mine buildings were demolished in the 1960's.

The post-medieval area of mining seems to have mainly been on the flat ground below Graig Fawr hill, where the Clive engine house still stands, and near which a prehistoric find was apparently made on the dressing floors. Earlier working is signified by a fairly large number of opencuts on the south and west slopes of the hill, although none can be directly dated from the visible remains. The series of narrow opencuts on the W side of Graig Fawr around SJ 05867 80373 are perhaps the most likely to represent early working as they lie on a bare rock outcrop and exploit veins which would have been fairly obvious without any exploratory excavations. Examination of these workings at the surface suggests that they predate the use of gunpowder, although a few shot holes are present where cursory attempts at reworking have been made. Most entrances are now blocked by metal grilles. The potential link to the Roman metal smithing workshops at Prestatyn, less than 1.5km distant, is also relevant.



Site Name: **Ffos-y-bleiddiad mine** ***PRN:*** **18070**

NGR: SH93527696 ***Map:*** SH97NW ***Altitude:*** 130

Type: Mine ***Form:*** Earthwork

Period	*Rarity*	*Documentation*	*Group Value*	*Survival*	*Fragility/ Vulnerability*	*Diversity*	*Potential*
X	X	X	X	X			X

Lead/copper mine comprising a wide opencut locally known either as the Fosse of Wolves or the Roman Fosse (Ffos-y-Rhufeiniaid). Evidence of Roman workings was recorded in the 19th-century, when it was claimed that Roman hammers and tools together with the hilt of a Roman sword had been found in the vicinity. Access to the entire length of the opencut is partially restricted by dense undergrowth and safety fencing, but sections are visible from the paths through Gopa Wood.

There has been some suggestion that the opencut is partially natural, but there is absolutely no basis for this as it is far too regular and focussed on a particular alignment to be anything other than a very large working designed to exploit what is presumably a wide vein system crossing the north end of the hill occupied by the scheduled ancient monument known as Castell Cawr hillfort. At times the opencut attains a width of around 15m, although it is more commonly 5m-10m in width and there are traces of exploratory working to either side on occasion. There are also some places where the base of the opencut has been extended down into narrow stopes, and there are no traces of rock drilling and gunpowder usage at any point. A section of the workings at SJ 93545 76988 has the appearance of firesetting. The condition and nature of these workings seems incompatible with mining of the 19th century and it is the writer's opinion that these workings may well belong to both the prehistoric and Roman periods.