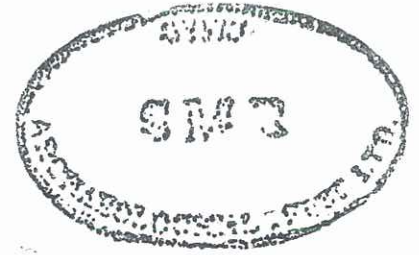


SEPT 2003



GWARNOETHLE

W/12/3796

Tir Gofal Farm Visit Historic Environment Report



Looking down the channel which runs east of the Roman water tank (PRN 49148).

Report No. 2003/105

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CAMBRIA ARCHAEOLOGY

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Gwarnoethle
Tir Gofal Farm Visit Historic Environment Report

By

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INTRODUCTION

This report is intended to provide a statement on the condition and recommended management of all known archaeological and historical sites and features on this farm at the time it was visited by Cambria Archaeology. This information will be used to inform the Tir Gofal Management Agreement for the farm.

Method Statement

The farm visit consisted of two phases:

Phase 1 was a rapid search of all readily available documentary, cartographic and published sources to try to understand the historical development of the farm and the wider landscape and to identify new sites of archaeological interest. The searches undertaken include information held in the regional Sites and Monuments Record, the relevant County Records Office and the National Library of Wales. New sites, or areas of interest were plotted onto a Geographical Information System based map for use during the field survey and for the final report.

Phase 2 was a farm visit to assess the extent, character and current condition of the archaeological and historical sites identified during the research phase. Due to time constraints recording is rapid and consists of photographs and sites notes. Some of the sites may not have been visited. The information gained during the visit has been used to determine their management recommendations.

GENERAL DESCRIPTION OF FARM

Gwarnoethle Farm is located at grid reference SN67204004, in the community of Cynwyl Gaeo. It was visited by Cambria Archaeology on September 26th, 2003.

The farmstead itself is seen on historic maps and was apparently referred to in 1638 as 'y gornoythe' (Jones,F:1987:p.86). Little is known about its early history or development, but the 1891 Ordnance Survey map records three buildings – the house (PRN 25065), the cartshed (PRN 49163) and a third building to the south. The 1907 map depicts four buildings in total – two modern sheds now replace the two buildings on the entrance track, south of the farmhouse. Both the farmhouse and the cartshed have also undergone substantial modification.

Gwarnoethle is within the Dolaucothi Estate, owned by the National Trust. Dolaucothi is perhaps most famous for its Roman gold mines, and parts of the mining complex fall within the boundaries of this farm. The site is immensely complex and the precise nature and chronology of the workings is still not well understood. However, an outline understanding of the mining process can be gained by interpretation of the remains (principally earthworks) which are spread across the landscape to the north and west of Gwarnoethle.

Parts of three Scheduled Ancient Monuments are included within Gwarnoethle's land, and these are marked on the attached map. SAM Cm208 covers the majority of the central area of the mining complex. Only the southernmost section of this Scheduled Area is included in this Tir Gofal application. Within that area is a small part of SAM Cm200N – the Cothi leat (PRN 1947). This carried water to the mines over a distance of at least seven miles, delivering it into several tanks and smaller leats along the way. The southern end of the leat (included in this application) was where the water was discharged into the last and largest of the tanks (PRN 49148) which has been estimated to have a capacity of close to a quarter of a million gallons (Lewis and Jones:1969:p.258). In the northeast of the farm another aqueduct – the Annell Leat (PRN 8882, SAM Cm210) can be made out, running northwest from the Caeo Forest.

Water was crucial to the mining activities – it was used for hushing (the process of scouring off topsoil and broken rock to reveal mineral seams and ore), for powering machinery and for ore washing. The use and management of water was also critical for processing and separating the gold and this is highlighted by the set of probable washing tables (PRN 49150) which survive within SAM Cm208. A gentle flow of water was run over the tables and the heavier gold particles would settle out from the waste water. The particles could be trapped in vegetation, fur or fleece, which was later burnt to recover the gold.

Although most famous for its Roman associations, Dolaucothi's history extends both sides of the Roman occupation. A group of hut circles south of the main complex seem to be associated with small-scale mining of an exposed rock-face (Lewis and Jones:1969:p.253), indicating that the site was probably known and used prior to its development by the Romans. It has also been suggested that a crushing mill was in use at the site somewhere between 1200 and 1700 A.D (Austin and Burnham:1984:p.304 – 313). Although a Roman date could also be applied to this mill (Burnham:1997:p.325 – 336) it does seem that sporadic, small-scale extraction took place at

intervals until the late 19th /early 20th century. At this stage the mines were re-opened more fully, and several of the Roman levels re-used (Annels and Williams:1983:p.3).

During 1938-9 the site was taken on by British Goldfields, and this phase of use has left very visible marks on the landscape. In the west of Gwarnoethle's land is a field containing a large number of concrete blocks – wall foundations and footings, and plinths for machinery (PRN 20429 and 49154 – 49162). This are the remains of the British Goldfields processing mill – where the ore was processed into gold blocks and sulphide concentrates. Despite heavy investment and a number of exploratory shafts (e.g. PRN 49160) Dolaucothi proved financially unviable and was abandoned by British Goldfields only a year after work had started in earnest.

The highly visible mining remains across the whole site – both within Gwarnoethle and outside its boundaries – form a complex, multi-period landscape. The importance of the Roman elements has been recognised by the designation of the aqueducts and the central mining area as Scheduled Ancient Monuments. However, the importance of the later mining activities should not be underestimated. This landscape is remarkable in part because it has been extensively re-used, and its significance has not been lost.

In 1998 the National Trust carried out an archaeological survey of the Dolaucothi Estate. Their reference numbers for features have been included where known.

MAIN MANAGEMENT RECOMMENDATIONS

DOLAUCOTHI GOLD MINE – PRN 1946

Management recommendations for individual sites are given under the relevant PRN.

A possibility has been raised through Tir Gofal for the field containing the tank (PRN 49148), washing tables (PRN 49150) and opencast (PRN 49151) to be opened to the public as permissive area access. A significant number of visitors may be expected since the Dolaucothi mines are a substantial tourist attraction in the area. Consequently although area access is, in principle, to be encouraged, steps should be taken to ensure that the monuments are not damaged. The simplest solution may be for interpretation panels or leaflets to be produced, explaining what the site is and requesting visitors to avoid sensitive areas, which could be highlighted.

The field containing the 1930s mill site (PRN 20429) makes up a part of the tour from the Dolaucothi mines, but there is no information present on the site itself, despite the fact it is highly visible. The unprepossessing nature of the concrete remains makes it imperative that visitors can understand the area, or else it just appears as an eyesore. The provision of interpretation panels is strongly recommended for this site. At present it can only be understood by the relatively small numbers of people who go on a guided tour of the complex. Panels or leaflets within the visitor centre at Dolaucothi and at the campsite/caravan park at Pen Lan Wen farm, immediately west of this field, would allow a much wider audience appreciation of Dolaucothi's recent history.

Issues of interpretation and access need addressing across the sites which lie within Gwarnoethle farm. Tir Gofal may be an opportunity for CCW and the National Trust to work in partnership to produce or commission appropriate materials. It would also be a good opportunity to highlight the positive benefits of Tir Gofal's management of both natural and historic landscapes.

The 1998 National Trust archaeological survey of the Dolaucothi Estate summarised that *"Interpretation at all levels requires an urgent reassessment"* (Plunkett Dillon and Swanson: 1998: p.8) and this report can do no better than to echo that sentiment.

ANNELL LEAT – PRN 8882, SAM Cm210

In general this site is in fair condition, but there are a few specific areas of concern. The scrub and bracken at the southwest end is obscuring the visibility of the site, and the roots will also cause damage to the relatively slight earthworks. This vegetation should be cut at ground level and removed. Great care should be taken not to damage the ground surface – the works should only be carried out when conditions are dry, and roots should not be dug or dragged out.

Several sheep scrapes also need addressing. The simplest solution may be to temporarily cover the eroded area with chicken wire (taking care not to put pegs within the Scheduled Area) and leave the netting in place until the grass cover has re-established itself. If erosion continues to be a problem, then it may become necessary to use temporary electric fencing to periodically exclude all stock from the aqueduct. Permanent stock exclusion is not desirable for this site, since the sheep are generally maintaining an even pasture cover.

Management recommendations for Scheduled Ancient Monuments have been made in consultation with Cadw. Even where Scheduled Monument Consent is not required, Cadw should be contacted and notified prior to any work being carried out on SAMs.

TANK – PRN 49148, part of SAM Cm200(N)

The site is within the Scheduled Area of the Cothi leat (SAM Cm200N) and is therefore protected by law. The most pressing concern for this site is the control of the vegetation which is growing on the outer (down-slope) bank of the tank. This should be cut at ground level and removed. However, great care should be taken that the ground surface is not damaged during these works, and they should only be carried out when conditions are dry. This will need to be done as a matter of some urgency, before the scrub becomes so established that its removal inevitably causes erosion of the topsoil.

The exposed rock of the channel is potentially vulnerable to damage, and great care should be taken not to knock or damage this area whilst clearance is being carried out. It may be advisable to temporarily mark out the area with high-visibility tape or meshing during works on the tank.

Vegetation growth on the slopes above the tank is also a concern, and the scrub and gorse should be removed in the same way. These slopes are within Scheduled Area Cm208 and are therefore still protected from all ground-intrusive activities.

Another concern relates to the exit channel, at the point where it swings across to the fenceline. A short length of track runs from a gateway across the channel at this point, and the ground surface is becoming very disturbed and poached. This gate should not be used in wet weather, and the grass cover should be allowed to re-establish itself. If erosion continues to be a problem, then use of the gateway should be discontinued, and new access put in to this field in a less sensitive area.

Management recommendations for Scheduled Ancient Monuments have been made in consultation with Cadw. Even where Scheduled Monument Consent is not required, Cadw should be contacted and notified prior to any work being carried out on SAMs.

GAZETTEER OF SITES AND MONUMENTS

PRN	1946	Site Name	DOLAUCOTHI	Grid	SN66454025
Site Type	METAL MINE - GOLD	Period	ROMAN; MEDIEVAL?; POST- MEDIEVAL; MODERN	Reference Site status	SAM Cm208

Description

The Dolaucothi goldmines. These goldmines were utilised over a long time period, and a large area of the mines has been designated as a Scheduled Ancient Monument (Cm208). Only a part of the Scheduled Area falls within this farm's boundaries.

Dolaucothi was probably first used for gold extraction in the pre-Roman period. A small group of hut circles south of the main complex seem to be associated with small-scale mining of an exposed rock-face (Lewis and Jones:1969:p.253), indicating that the site was known prior to its development by the Romans.

The Roman phase of workings is the one for which Dolaucothi is most famous. The site is immensely complex and the precise nature and chronology of the workings is still not well understood. However, an outline understanding of the mining process can be gained by interpretation of the surface remains (principally earthworks).

Water was conveyed into the site by means of two main aqueducts – the Cothi leat (PRN 1947, SAM Cm200N) and the Annell leat (PRN 8882, SAM Cm210) – and a number of smaller leats. The Cothi leat is notable for bringing water into the site from a distance of over 7 miles! Both of the leats are carefully engineered, running along gentle gradients and charging a number of tanks along their routes. Water was crucial to the mining activities – it was used for hushing (e.g. PRN 49148. Hushing is the process of scouring off topsoil and broken rock to reveal mineral seams and ore), for washing tables (eg. PRN 49150) These were used to settle out heavier gold particles from the waste water. The particles would be trapped in vegetation, fur or fleece, which was later burnt to recover the gold) for powering machinery and for ore washing.

Most of the mining features themselves – adits and levels as well as opencast workings – are in the area just north of this farm, and a number of them are open to the public. It is supposed that the earlier mining on the site was opencast, and that as the easily accessible gold was exhausted the underground workings were put in place.

Many of the Roman features at Dolaucothi have been obscured or modified during later phases of use and it has been suggested that a crushing mill was in use at the site somewhere between 1200 and 1700 A.D (Austin and Burnham:1984:p.304 – 313). Although a Roman date could also be applied to this mill (Burnham:1997: p.325 – 336) it does seem that sporadic, small-scale extraction took place at intervals until the late 19th/early 20th century. At this stage the mines were re-opened more fully, and several of the Roman levels re-used (Annells and Williams:1983:p.3).

. During 1938-9 the site was taken on by British Goldfields, and this phase of use has left very visible remains (PRN 20429 and 49154 – 49162). Sadly, Dolaucothi proved financially unviable and was abandoned by British Goldfields only a year after work had started in earnest.

The visible mining remains across the whole site form a complex, multi-period landscape. The importance of the Roman elements has been recognised by the designation of the aqueducts and

the central mining area as Scheduled Ancient Monuments. However, the importance of the later mining activities should not be underestimated. An understanding of the later phases of use not only contributes to a more detailed knowledge of the earlier features but also informs a more complete knowledge of the landscape as a whole and highlights its continued significance from pre-Roman times to the modern day.

Recommendations

Management recommendations for individual sites are given under the relevant PRN. Management recommendations for Scheduled Ancient Monuments have been made in consultation with Cadw. Even where Scheduled Monument Consent is not required, Cadw should be contacted and notified prior to any work being carried out on SAMs.

A possibility has been raised through Tir Gofal for the field containing the tank (PRN 49148), washing tables (PRN 49150) and opencast (PRN 49151) to be opened to the public as permissive area access. A significant number of visitors may be expected since the Dolaucothi mines are a substantial tourist attraction in the area. Consequently although area access is, in principle, to be encouraged, steps should be taken to ensure that the monuments are not damaged. The simplest solution may be for interpretation panels or leaflets to be produced, explaining what the site is and requesting visitors to avoid sensitive areas, which could be highlighted.

The field containing the 1930s mill site (PRN 20429) makes up a part of the tour from the Dolaucothi mines, but there is no information on the site itself, despite the fact it is highly visible. The unprepossessing nature of the concrete remains makes it imperative that visitors can understand the area, or else it just appears as an eyesore. The provision of interpretation panels is strongly recommended for this site. At present it can only be understood by the relatively small numbers of people who go on a guided tour of the complex. Panels or leaflets within the visitor centre at Dolaucothi and at the campsite/caravan park at Pen Lan Wen farm, immediately west of this field, would allow a much wider audience appreciation of Dolaucothi's recent history.

Issues of interpretation and access need addressing across the sites which lie within Gwarnoethle farm. Tir Gofal may be an opportunity for CCW and the National Trust to work in partnership to produce or commission appropriate materials. It would also be a good opportunity to highlight the positive benefits of Tir Gofal's management of both natural and historic landscapes.

The 1998 National Trust archaeological survey of the Dolaucothi Estate summarised that *"Interpretation at all levels requires an urgent reassessment"* (Plunkett Dillon and Swanson: 1998: p.8) and this report can do no better than to echo that sentiment.

Site Category A

PRN	1947	Site Name	COTHI LEAT	Grid Reference	SN66594031
Site Type	LEAT/AQUEDUCT	Period	ROMAN	Site status	SAM Cm200N

Description

Only a short section of this Scheduled leat falls within Gwarnoethle farm boundaries. The Cothi leat brought water along the west side of the slopes of Allt Cwmhenog into the Dolaucothi mines. The engineering of the leat is quite complex and the exact nature of the way in which water entered the large tank (Tank E, PRN 49148) and the washing tables (PRN 49150) is not known. It has been suggested that a sluice controlled water flow into these two features (Lewis and Jones:1969:p.258) but this is hard to verify on the ground. The line of the leat is most clearly visible as a break in the northeast corner of the tank (PRN 49148) and can be faintly traced running northwest towards the fenceline.

Recommendations

No ground breaking activities can be carried out in this area since the feature is a Scheduled Ancient Monument. Some scrub clearance is recommended for the tank (PRN 49148) and it should be ensured that the leat is not damaged during these works.

Management recommendations for Scheduled Ancient Monuments have been made in consultation with Cadw. Even where Scheduled Monument Consent is not required, Cadw should be contacted and notified prior to any work being carried out on SAMs.

Site Category A

National Trust no.

PRN	8882	Site Name	ANNELL LEAT	Grid	SN67494055
Site Type	LEAT/AQUEDUCT	Period	ROMAN	Reference	
				Site status	SAM Cm210

Description

This site falls into two separate areas. The east end of the site a Scheduled Ancient Monument and is the known and visible line of the aqueduct. The leat then continues to the south and west – this is not Scheduled. Although it is the projected line of the leat, parts of the earthwork are visible along this route.

PRN 8882 (east) – SAM Cm210

This Scheduled Ancient Monument is a section of the Annell Leat. The leat would have carried water into the Dolaucothi mines (PRN 1946) in order to wash the ore which was being extracted from the mines. It is not known whether the leat took water from the Annell itself, or whether it picked up small tributaries and surface water.

Only a short section of the Annell leat is scheduled (see attached map). This part survives as a clearly visible, broad track-like cut in the hillside. For the most part, the leat stays very level and follows the natural contour of the hillside. However, at its northernmost end, the leat seems to curve quite sharply upslope and then disappears into a boggy area at the head of a small valley. In general this feature is very visible and well preserved and in places it appears that another 'track' is carved just upslope from the leat. In one place, it appears that there are three parallel sections of the leat. Sections of these upper paths may simply be sheep tracks, but Lewis (1976) argues for a triple channel system within the Annell leat, with wooden shuttering supporting the banks between the channels.

The leat passes just in front of a rock-cut spring (PRN 49146) which probably fed into it. The relationship between these two features is not entirely clear, and the line of the water channel is harder to pick up at this point.

The southwest end of the Scheduled area is quite overgrown with bracken and scrub, and the line of the leat is harder to see. There are also a few sheep scrapes along the length of this part of the leat.

PRN 8882 (west)

The projected line of the Roman Annell leat, continuing from the Scheduled section to the north. The southern part of this feature is not visible on the ground, partly due to scrub and bracken growth. Recent bracken clearance had revealed clearly the earthwork of the leat further north, two fields south of the Scheduled Area. The earthwork there is in a good, stable condition, and it is likely that further physical remains may survive.

Recommendations

General recommendations, applicable to the length of the leat.

No ground breaking activities should take place along the line of this leat. Any bracken or scrub clearance should be carried out by cutting the vegetation down to ground level and removing it. Roots should not be dug or dragged out. Ideally, the whole length of the feature should be maintained under a permanent, even grass covering which will be best achieved under a regime of light grazing.

PRN 8882 (east) – SAM Cm210

In general this part of the feature is in fair condition, but there are a few specific areas of concern.

The scrub and bracken at the southwest end of the Scheduled area is obscuring the visibility of the site, and the roots will also cause damage to the relatively slight earthworks. This vegetation should be cut at ground level and removed. Great care should be taken not to damage the ground surface – the works should only be carried out when conditions are dry, and roots should not be dug or dragged out.

The sheep scrapes also need addressing. The simplest solution may be to temporarily cover the eroded area with chicken wire (taking care not to put pegs within the Scheduled Area) and leave the netting in place until the grass cover has re-established itself. If erosion continues to be a problem, then it may become necessary to use temporary electric fencing to periodically exclude all stock from the aqueduct. Permanent stock exclusion is not desirable for this site, since the sheep are generally maintaining an even pasture cover.

Management recommendations for Scheduled Ancient Monuments have been made in consultation with Cadw. Even where Scheduled Monument Consent is not required, Cadw should be contacted and notified prior to any work being carried out on SAMs.

Site Category A
National Trust no. 80483



Plate 1 (above) *Part of the Scheduled section of the Annell Leat (PRN 8882, SAM Cm210). The leat survives as a clear earthwork running around the contour of the hill.*

Plate 2 (below) *Another section of the Annell Leat. This area is not Scheduled, and was only revealed by recent bracken cutting. The leat survives as a slight terrace, visible in the picture as a strip of greener vegetation.*



PRN 20429 Site Name Grid Reference SN66423998

Site Type PROCESSING MILL Period MODERN

Description

An area of concrete footings, now partially turfed over. These are the remains of the 1937 British Goldfields processing mill which apparently housed a jaw crusher and coarse ore bin (PRN 49155), a gyratory crusher (PRN 49154), a magnetic separator and a water tank (Plunkett Dillon and Swanson: 1998: p.76). Ore was received into the processing mill from the mineshafts via a conveyor belt (PRN 49153) whose brick and concrete supports can still be seen. It passed through the jaw crusher and coarse ore bin (PRN 49155) before being transported to the gyratory crusher to be further reduced. By the time the ore left the gyratory crusher, it was in pieces smaller than 1cm (Annels and Williams: 1983: p.14). A magnetic separator was apparently located next to the gyratory crusher, the first stage in the removal of impurities from the gold. From here, the conveyor belt took the crushed and prepared ore to the ball mill (PRN 49152) for its final processing into gold bars and sulphide concentrate. The tailings were released down the valleyside to the east.

In general, the remains of this processing mill consist of concrete footings and plinths, along with brick and cement supports for the conveyor belt. They are generally stable and in good condition, but are very difficult to interpret or make sense of on the ground. An additional platform (PRN 49160) was identified on this field visit, due to recent bracken clearance by the farmer. It is unknown what this platform is, but it is almost definitely associated with the 1930s mill site. As well as these discrete features, the whole field is riddled with hollows, gulleys and small pits which are clearly associated with the mill complex, but which are not well documented.

Recommendations

Recommendations for individual features are made under the PRNs for those sites. In general, though, this area should be maintained under pasture, and no ground-intrusive activities should be carried out in this field.

The site would also repay a detailed, measured survey. As well as the concrete remains, there are a considerable number of undocumented earthworks which need to be recorded whilst a level of detail is still visible. This may be something which Lampeter University or Trinity College, Carmarthen may be interested in undertaking as a training exercise for their students.

The 1930s mill site makes up a part of the tour from the Dolaucothi mines, and access is via a track which leads from the road up to the National Trust property at Pen Lan Wen farm.

However, there is no information given about the site despite the fact it is highly visible. The unprepossessing nature of the concrete remains makes it imperative that visitors can understand the site, or else it just appears as an eyesore. Lack of understanding may make the site more vulnerable as it is not otherwise seen as 'worthy' of protection. Please see the recommendations made for PRN 1946.

Site Category B
National Trust no. 80357

PRN	25065	Site Name	GWARNOETHLE; GORNOETHLE	Grid Reference	SN67194005
Site Type	FARMHOUSE	Period	POST-MEDIEVAL		

Description

This large farmhouse was a major dwelling that was apparently referred to in 1638 as 'y gornoythe' (Jones,F:1987:p.86) The house appears to have been quite extensively altered. It is in good condition and inhabited.

Recommendations

Since the farmhouse is in use as a private dwelling it is not included in the Tir Gofal scheme. No management recommendations apply.

Site Category B

National Trust no. 80419

PRN	49145	Site Name		Grid Reference	SN66894026
Site Type	MINESHAFT	Period	UNKNOWN		

Description

A circular depression, around 8m in diameter and up to 1.5m deep. The depression has a pronounced 'lip' and is probably a blocked mineshaft of unknown date. The site is under pasture and appears to be stable although there is an active burrow on the northwest side.

Recommendations

The site should be maintained under pasture, and occasionally checked for erosion. A pronounced track is developing around the 'lip' of the site. If the erosion becomes more severe then chicken wire should be pegged across the site for long enough to allow the grass to recover. The wire can then be removed.

Site Category B

National Trust no. 80504

PRN 49146 **Site Name** **Grid Reference** SN67474053

Site Type SPRING **Period** ROMAN?

Description

A spring which appears to be rock cut. The rock around the spring seems to have been deliberately cut and modified to contain a pool (now silted up). The spring rises only about 2m above the Annell Leat (PRN 8882) and therefore the water from the pool would have been picked up by the leat. It is therefore likely that the two features are related, and the spring plays an important part in the water management for the Dolaucothi mines.

Recommendations

The site is very stable, but is becoming a little overgrown. Larger shrubs and saplings should be cut back at ground level and removed, and the roots may need to be treated to prevent re-growth. The spring feeds into a small stream which is surrounded by sheep tracks. Due to its proximity to the Annell Leat, this area should be regarded as archaeologically sensitive. It should be checked occasionally to ensure that the sheep tracks do not erode too deeply into the ground surface, and that the surface does not become badly poached in the winter months. If this becomes a problem, it may become necessary to temporarily exclude this area from grazing.

Site Category B

National Trust no. 80503

PRN 49147 **Site Name** **Grid Reference** SN66884005

Site Type TANK?;
NATURAL
FEATURE? **Period** UNKNOWN **Site status**

Description

A rectangular platform which may be the slight remains of a tank. However, this feature may have been misidentified, and may be natural in origin. It does not seem to be associated with any leats or water-channels, which makes its identification as a tank considerably less certain.

Recommendations

Although this feature may have been misidentified, there is still a possibility that it is associated with the Roman exploitation of Dolaucothi mines. Consequently, no ground-breaking activities should be carried out in this location.

Site Category B

National Trust no. 80465

PRN	49148	Site Name		Grid Reference	SN66684006
Site Type	TANK	Period	ROMAN	Site status	Part of SAM Cm200N

Description

A large water tank (Tank E, Cadw). This is the last in a series of tanks which are fed by the Cothi leat (PRN 1947) and is substantially larger than any of the previous ones. It is part of the Scheduled Area of the Cothi leat (SAM Cm200).

The base of the tank is formed of a large rectangular platform (c.45m x 20m) which is sunk into the side of the hill. The eastern (up-slope) side therefore forms a large 'wall' whilst the western side (down-slope) is bounded by a wide bank up to 2m high. This massive bank was described in 1983 as being "*... a 17m wide outer wall of turf with a clay inner lining and an outer bank of shale, rubble and boulder clay*" (Annels and Williams:1983:p.6).

At the west end, the Cothi leat (PRN 1947) enters the tank via a break in the northeast corner. At its east end, an exit channel runs away from the tank. The channel is visible as a pronounced gully, but previous excavation has revealed that the channel is rock-cut, around 1.5m wide and with sheer sides 1.5m tall sheer sides. Parts of the rock sides are still visible where these excavations took place.

The exit channel then drops sharply into a feature which may represent a deliberately created pool (PRN 49149) before swinging in a wide arc, almost touching the fenceline to the southeast. It then curves back towards the Caio road.

The tank is in a stable condition, but the site is somewhat overgrown. There is substantial gorse and scrub growing on the outer (down-slope) bank and another heavy patch of gorse to the northeast, above the tank. The interior of the tank is quite clear, as is the exit channel to the east. However, where the rock sides are exposed, the channel is vulnerable to erosion, and one corner of the rock is already split and becoming softer and more flaky.

The function of this tank is still not well understood, nor is its relationship with the washing tables (PRN 49150). It has been suggested that a sluice controlled water flow from the leat into the washing tables and the tank, but this is not easy to verify on the ground (Lewis and Jones:1969:p.258). The tank may have been a 'hushing' tank, used to store water which was then released to scour off the soil overburden and reveal any mineral seams. The bedrock could then be split with hammers and wedges, leaving the required seams intact. Further hushing was carried out, and the scouring effect of the water carried away the quarried waste rock, allowing the gold ore to be removed more easily (Lewis, 1976). An earlier interpretation was that the tank was simply too large to be a hushing tank (an estimated capacity of a quarter of a million gallons) and that it was a reservoir, designed to catch and hold surplus water from the leat (PRN 1947). The steep drop into the pools (PRN 49150) may have been deliberately designed in order to allow the surplus water to power machinery – perhaps a waterwheel (Lewis and Jones:1969:p.258).

Whatever its function, this tank, and the associated exit channel and leat running into it are highly visible and impressive landscape features.

Recommendations

The site is within the Scheduled Area of the Cothi leat (SAM Cm200N) and is therefore protected by law. The most pressing concern for this site is the control of the vegetation which is growing on the outer (down-slope) bank of the tank. This should be cut at ground level and removed.

However, great care should be taken that the ground surface is not damaged during these works, and they should only be carried out when conditions are dry. This will need to be done as a matter of some urgency, before the scrub becomes so established that its removal inevitably causes erosion of the topsoil.

The exposed rock of the channel is potentially vulnerable to damage, and great care should be taken not to knock or damage this area whilst clearance is being carried out. It may be advisable to temporarily mark out the area with high-visibility tape or meshing during works on the tank.

Vegetation growth on the slopes above the tank is also a concern, and the scrub and gorse should be removed in the same way. These slopes are within Scheduled Area Cm208 and are therefore still protected from all ground-intrusive activities.

Another concern relates to the exit channel, at the point where it swings across to the fenceline. A short length of track runs from a gateway across the channel at this point, and the ground surface is becoming very disturbed and poached. This gate should not be used in wet weather, and the grass cover should be allowed to re-establish itself. If erosion continues to be a problem, then use of the gateway should be discontinued, and new access put in to this field in a less sensitive area.

A possibility has been raised through Tir Gofal for this field to be opened to the public as permissive area access. Please see the recommendations made for PRN 1946.

Management recommendations for Scheduled Ancient Monuments have been made in consultation with Cadw. Even where Scheduled Monument Consent is not required, Cadw should be contacted and notified prior to any work being carried out on SAMs.

Site Category A
National Trust no. 80319



Plate 3 (above) *The large tank (PRN 49148) at the end of the Cothi Leat (PRN 1947). To the left of the picture(upslope) the tank is terraced into the hillside. The flattened area is the silted up interior of the tank whilst the upturned 'lip' at the right of the picture is a massive bank forming a revetment wall.*

Plate 4 (below) *The exit channel to the east of the tank. Previous excavations revealed the rock-cut sides of this channel, and the exposed rock is now very vulnerable.*



PRN	49149	Site Name		Grid Reference	SN66704001
Site Type	POOL	Period	ROMAN	Site status	Part of SAM Cm200N

Description

The remains of a probable pool at the end of the channel leading away from the southeast end of Tank E (PRN 49148). This feature is a deep gully, which seems to have an artificial embankment on the west (down-slope) side. It is some 3m below the level of the exit channel to the east of the tank, so there would have been a substantial waterfall. The pool may have been deliberately created, or could be the result of erosion from the waterfall.

Recommendations

The feature is basically stable, but is overgrown. As with other features in this field, scrub and gorse should be cut off at ground level and removed. Care should be taken not to damage the ground surface during these works.

Site Category A
National Trust no. 80330

PRN	49150	Site Name	GWARNOEETHLE WASHING TABLES	Grid Reference	SN66614006
Site Type	WASHING TABLES	Period	ROMAN?	Site status	Part of SAM Cm208

Description

A gently curved channel around 45m long, cut into the hillside just below (to the northwest) of a large tank (PRN 49148). It is part of the Scheduled Area of the Dolaucothi goldmines (SAM Cm208).

Both the outline and the internal features of this site are very blurred, and it is difficult to produce an adequately detailed explanation of its function. However, it appears that the channel consists of perhaps three distinct 'pools', or platforms, stepped down the slope. The feature is much less pronounced than other earthworks in the same field (for eg the tank itself, PRN 49148, or the area of quarrying, PRN 49151) and it has been suggested that this may imply this feature belongs to a different period (Plunkett Dillon and Swanson:1998:p.63).

Washing tables consisted of a series of steps or pools lined with vegetation, fabric or fleece. A gentle flow of water down the tables would allow the heavier gold particles to settle out from the waste water. The particles would be trapped in the pool linings, which were later burnt to recover the gold.

Recommendations

This site is in a good, stable condition and the current management regime suits it well. Occasional checks for erosion should be made, otherwise the site should be maintained as existing.

Site Category A
National Trust no. 80321

PRN	49151	Site Name		Grid Reference	SN66614010
Site Type	QUARRY/ OPENCAST?	Period	UNKNOWN	Site status	Part of SAM Cm208

Description

A discrete area of excavation, part of which is depicted on the 2nd edition Ordnance Survey map. The date or purpose of this quarrying is not known, but the National Trust survey suggests that a later phase may have been associated with the British Goldfields 1930s exploitation of Dolaucothi (Plunkett Dillon and Swanson:1998:p.120).

The quarry seems to consist of three distinct 'scoops' into the hillside, roughly in a line running north-south. A fourth, more steep-sided 'scoop' cuts across two of the others, and appears to be later.

Recommendations

In general, the site seems to be in a good, stable condition. Some vegetation growth at the north and west sides of it may need to be cleared. As with other features in the area, vegetation should be cut at ground level and removed, and works should only be carried out in dry weather.

Site Category	A
National Trust no.	80506

PRN 49152 **Site Name** **Grid Reference** SN66434000

Site Type BALL MILL **Period** MODERN

Description

A large set of concrete footings, all that remains of the ball mill built in 1937 by British Goldfields. The footings are on three levels which are connected by steps and chutes. The first level (on the east side) is surrounded by an outer wall which has almost disappeared underneath grass and moss. This first level has a number of channels and plinths in it, which would have housed and supported ore processing machinery. The second level (central) is smaller and less complex whilst the third level (most westerly) is dominated by a massive concrete plinth which was, again, support for some of the machinery. The machinery was apparently all housed in corrugated iron sheds, now gone (Plunkett Dillon and Swanson: 1998: p.76).

The ball mill was the final stage in ore-processing. It received the crushed ore and had the capacity to produce gold bars and sulphide concentrate, which was exported to Seattle for the extraction of gold which was combined with pyrites.

Recommendations

In general, the site is very stable, and what remains now is that which was left after demolition of the mill and removal of the machinery. A few saplings are growing within the structure itself, and these should be cut down before the roots begin to damage the concrete. Regular light grazing of the site will help to ensure that there is little or no regrowth.

Site Category B
National Trust no. 80356



Plate 5 Concrete footings and plinths for machinery – all that remains of the final stage of ore processing at the British Goldfields processing mill (PRN 20429). These are the foundations of the ball mill (PRN 49152)

PRN 49153 **Site Name** **Grid Reference** SN66383998

Site Type CONVEYOR BELT **Period** MODERN

Description

A conveyor belt system which moved the ore from the tippler (PRN 49156) through the various stages within the processing mill (PRN 20429) and finally into the ball mill (PRN 49152). The route of the conveyor belt is visible as a series of irregularly spaced low brick plinths, some with concrete caps. Many of these are becoming overgrown.

These plinths are some of the most vulnerable of the structural elements on this site. Where the plinths are not capped with cement, water is penetrating into the mortar and weakening the structure. The bricks are also more vulnerable to damage by vegetation and tree-roots than other concrete structures are.

Recommendations

Vegetation should be kept clear of these sites in order to ensure that they remain visible and are not damaged by roots. Any vegetation growing in or around the plinths should be cut back to ground level. Regular light grazing should help to discourage re-growth. Consideration should be given to capping the exposed plinths with cement, to prevent further water penetration. If this is to be carried out it should be ensured that the cement used is matched to that found on some of the other plinths.

No ground intrusive activities should be carried out near these sites.

Site Category B

National Trust no. n/a



Plate 6 *Part of the route of the conveyor belt (PRN 49153). This picture is looking from the ore bin (PRN 49155) towards the tippler (PRN 49156).*

PRN 49154 **Site Name** **Grid Reference** SN66413998

Site Type GYRATORY CRUSHER **Period** MODERN

Description

A slightly raised concrete platform about 8m square, with two massive plinths which supported the crushing machinery. Part of the machinery within the processing mill (PRN 20429).

Recommendations

The site is stable, and extremely robust. There are no immediate threats to the platform itself, but it should be ensured that no ground-breaking activities take place in the vicinity of the site.

Site Category B

National Trust no. 80511



Plate 7 *The concrete supports for the gyratory crusher (PRN 49154).*

PRN 49155 **Site Name** **Grid Reference** SN66393997

Site Type ORE BIN;
CRUSHER **Period** MODERN

Description

The concrete remains of the ore bin, part of the machinery within the processing mill (PRN 20429). A 'funnel shaped' concrete wall, around 0.4m tall, is surrounded by earthworks – turf covered hollows and mounds of unknown purpose. Brick and cement stands for the conveyor belt (PRN 49153) are visible to the northwest and northeast.

Recommendations

The concrete itself is under no direct threat and is very stable. However, it should be ensured that the surrounding earthworks are not damaged either by ground-breaking activities or by erosion from people or animals.

Site Category B

National Trust no. 80510

PRN 49156 **Site Name** **Grid Reference** SN66373999

Site Type TIPPLER **Period** MODERN

Description

The site of this semi-automatic tippler is marked by a U-shaped concrete structure with walls around 1.5m high. Here, ore was tipped onto the conveyor belt (PRN 49153) which linked the coarse ore bin (PRN 49155) the crusher (PRN 49154) and the ball mill (PRN 49152).

The remains are partially moss covered but clearly visible.

Recommendations

The site should be maintained in its current condition. Scrub or nettles growing up in or around the site should be cut at ground level and removed. A future management regime of regular light grazing should help to ensure that vegetation is kept down.

Site Category B

National Trust no. 80305

PRN 49157 Site Name Grid Reference SN66394000

Site Type SPOIL HEAP Period MODERN

Description

A small spoil heap with no obvious structure. A pronounced gully leads from the tippler (PRN 49156) to the spoil heap.

Small trees are growing in and near the spoil heap.

Recommendations

The trees and saplings should be cut at ground level and removed. The roots should not be dug or dragged out, but should be treated to prevent re-growth. No further ground-intrusive activities should take place around this site.

Future management should aim to maintain an even grass covering over the earthworks – low pressure grazing is probably the most practical way to achieve this and to prevent the re-growth of saplings.

Site Category B

National Trust no. 80509



Plate 8 View from the tippler (PRN 49156) down a small gully to the spoil heap (PRN 49157). The whole field containing the 1930s processing site (PRN 20429) is littered with similar small earthworks connecting different parts of the machinery. They are not yet properly recorded or understood.

PRN 49158 **Site Name** **Grid Reference** SN66393993

Site Type POWER HOUSE **Period** MODERN

Description

A set of concrete footings for the powerhouse which housed the generators and fuel tanks. The concreted area measures around 14m by 16m and includes the base of a separate water cooling tower immediately southwest. The power house apparently housed four generators producing electricity at 240V (Annels and Williams:1983:p14).

The remains are in a good condition, the concrete has a number of channels and plinths in it, which would have housed and supported the generators and associated machinery. Most of these features are still visible, although there is some scrub growth on the site.

Recommendations

Scrub and saplings growing on the site should be cut to ground level and treated to prevent re-growth before the roots begin to lift or split the concrete. Otherwise, the site should be maintained in its current condition.

Site Category B
National Trust no. 80358

PRN 49159 **Site Name** **Grid Reference** SN66423993

Site Type PLATFORM **Period** MODERN

Description

A roughly rectangular earth platform observed under recently cut bracken. This platform is presumably associated with the gold processing plant (PRN 20429) but its nature or function is unknown.

Recommendations

No ground intrusive activities should be carried out in the vicinity of this site. Bracken growth should be kept under control.

Site Category D
National Trust no. n/a

PRN 49160 **Site Name** **Grid Reference** SN66364005

Site Type SHAFT COLLAR **Period** MODERN

Description

Concrete walls around 0.8m high mark the remains of a square shaft collar. One iron girder is in place within the shaft wall on the west side, on the east side the corresponding girder is loose and lying on the ground next to the collar.

The site is now filled with earth and is very stable, although slightly overgrown.

This shaft was apparently opened up after the main mine had ceased working. It was constructed as an exploratory shaft in 1938 or 1939, after British Goldfields had exhausted their funds.

Recommendations

The site is visible and stable, although overgrown. The vegetation around it should be kept down, and the loose girder should be removed for safe-keeping.

Site Category B
National Trust no. 80335

PRN 49161 **Site Name** **Grid Reference** SN66333998

Site Type SPOIL HEAP? **Period** MODERN?

Description

A substantial mound, now turf-covered, just north of the track to Pen Lan Wen farm. The feature appears to be a spoil heap, and this seems a likely explanation given its proximity to other mining remains. However, it may be associated with the creation and/or later removal of a pond seen close to this area on the 1907 Ordnance Survey map.

Recommendations

This feature should not be disturbed, and should be maintained under a stable turf covering.

Site Category B
National Trust no. 80354

PRN 49162 **Site Name** **Grid Reference** SN66364002

Site Type TRAMWAY
ENGINE **Period** MODERN

Description

This site was not identified on the field visit. The following description is taken from the National Trust's 1998 archaeological survey.

"A concrete T-shaped platform is the only visible remains of the hut which housed the engine used to haul the ore up the tramway...from the shaft to the processing area...The site is partially covered with vegetation but because of the drought in the summer of 1989 the outline was clearly visible. The remaining footings measure approximately 5.5m by 5m."(Plunkett-Dillon and Swanson:1998:p.75).

Recommendations

The site is very stable and is under no immediate threat. However, no ground intrusive activities should be undertaken in this area.

Site Category B
National Trust no. 80353

PRN 49163 **Site Name** GWARNOETHLE; **Grid** SN67224005
Site Type CARTSHED **Period** GORNOETHLE
POST-MEDIEVAL **Reference**

Description

A stone-built cartshed, now considerably modified. It is seen on the 1891 and 1907 Ordnance Survey maps. Steps at the north end indicate that the building was probably originally a typical small cartshed with a granary above.

New brick arches above entrances and a corrugated plastic roof are the most obvious modern alterations, and the building is in a stable and weatherproof condition and appears to be in use. This cartshed and the farmhouse (PRN 25065) seem to be the only buildings surviving of the four seen on the 1907 Ordnance Survey map.

Recommendations

Where possible, future maintenance and repair works should utilise materials and techniques which are sympathetic to the original construction of the building.

Site Category C

PRN	49164	Site Name	PEN LAN WEN FARM	Grid Reference	SN66363993
Site Type	TRACKWAY	Period	POST-MEDIEVAL		

Description

A hollow way, the route of which is seen on 1891 and 1907 Ordnance Survey maps. The track runs southeast from Pen Lan Wen farm and appears only to be an access track to one of the fields – there is no indication that the route continued any further. At its northern end, the track has been truncated by a modern farm track, but the Ordnance Survey maps do not show the route continuing beyond the farm itself.

The hollow way is bordered with banks up to 1.25m tall. On the north side, the bank is topped with a hedge and wire fencing. On the south side the banks are no longer topped with a hedge, although stumps and occasional scrubby hawthorn re-growth show that they once were.

Recommendations

Restoration of this lane has been proposed through the Tir Gofal scheme. The site is currently under no immediate threat and seems to be stable, so although restoration is to be welcomed it is perhaps not the priority for this farm.

If restoration is to be carried out, then the south bank should be re-planted and stock temporarily fenced out while the hedge is growing. Eventually, the ideal management would be to have a stockproof hedge along the south bank allowing the lane to be used, if necessary, for moving stock from one field to another, as it was originally intended.

Site Category C

National Trust no. 80355



Plate 9 A substantial trackway (PRN 49164) marked on the 1st and 2nd edition Ordnance Survey maps.

SITE AND AREA STATUS GLOSSARY

The following abbreviations are used in the gazetteer to refer to site and area status. These schedules, lists and registers are compiled and maintained by Cadw: Welsh Historic Monuments.

SAM - Scheduled Ancient Monument

This is a statutory designation. Scheduled Ancient Monuments are protected under the Ancient Monuments and Archaeological Areas Act 1979.

LB1, LB2* & LB2 – Listed Building 1, 2* & 2

This is a statutory designation. Listed buildings are protected under the Planning (Listed Buildings and Conservation Areas) Act 1990.

HLW - Historic Landscapes of Wales

Historic Landscapes of Wales are defined by the *Register of Landscapes, Parks and Gardens of Special Historic Interest in Wales: Part 2.1 Landscapes of Outstanding Historic Interest and Part 2.2 Landscapes of Special Historic Interest*. The register is advisory and has no statutory powers.



PGW - Parks and Gardens of Wales

Parks and Gardens of Wales are defined by the *Register of Landscapes, Parks and Gardens of Special Historic Interest in Wales: Part 1 Parks and Gardens*. The register is advisory and has no statutory powers.






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- Ordnance Survey 1907 Carmarthenshire XVII.NW


Gwarnoethle
Tir Gofal Historic Environment Consultation
Countryside Council for Wales Reference W/12/3796
Cambria Archaeology Reference PRN47200
National Grid Reference SN67204004

 Farm Boundary
 Historic Landscape Character Area


Site Category A - National Importance

-  Scheduled Ancient Monuments
-  Grade 1 and Grade 2* Listed Buildings
-  Sites and Buildings of National Importance without a statutory designation
-  Registered Parks and Gardens of Historic Interest
-  Registered Landscapes of Historic Interest


Site Category B - Regional Importance

-  Sites and Buildings of Regional Importance including Grade 2 listed buildings

Site Category C - Local Importance

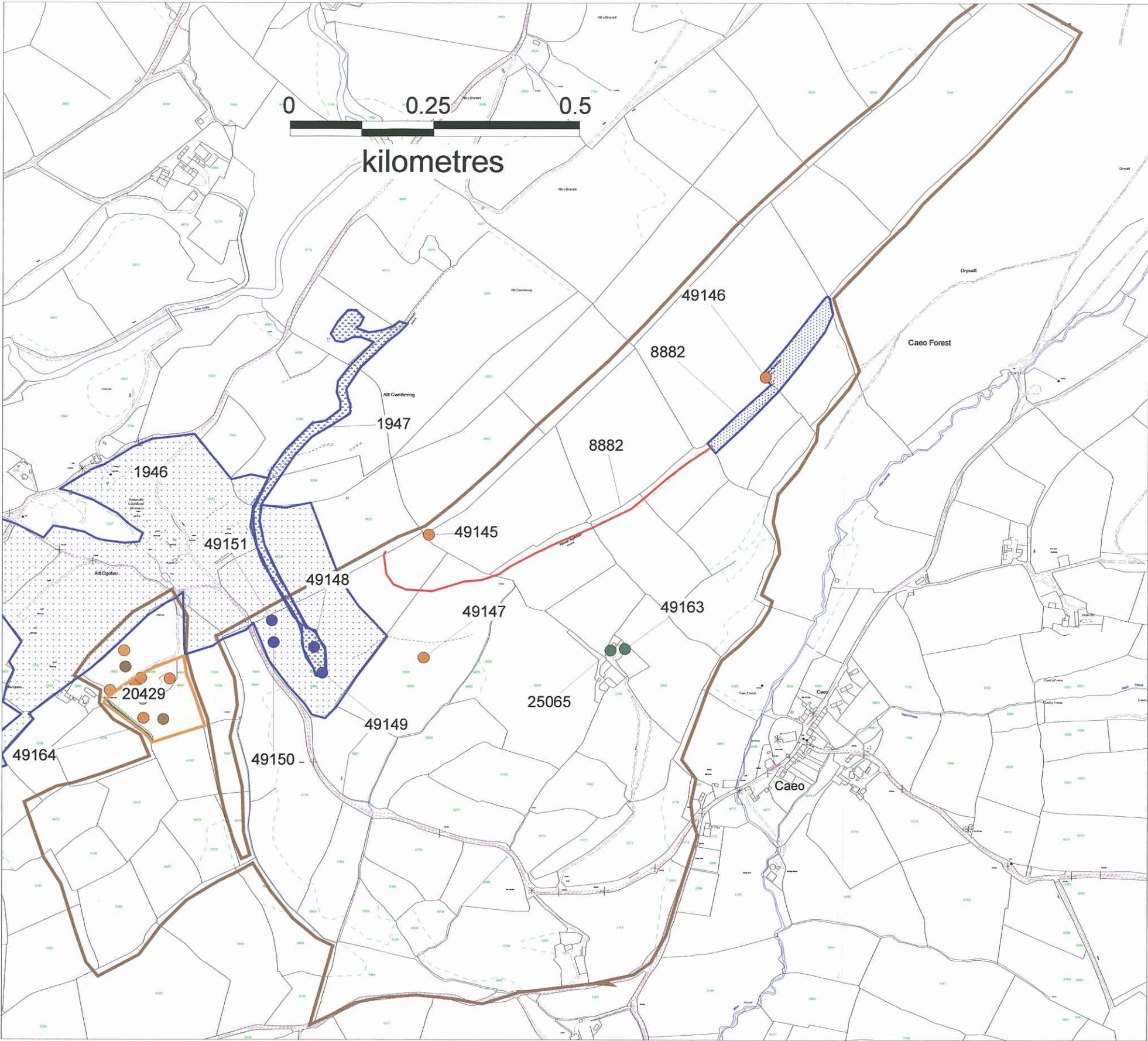
-  Sites and buildings of Local Importance

Site Category D – Unknown Importance

-  Sites requiring further investigation and sites with no physical definition

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Gwarnoethle – British Goldfields processing site
 Tir Gofal Historic Environment Consultation
 Countryside Council for Wales Reference W/12/3796
 Cambria Archaeology Reference PRN47200
 National Grid Reference SN66413997


 Farm Boundary
 Historic Landscape Character Area

Site Category A - National Importance
 Scheduled Ancient Monuments
 Grade 1 and Grade 2* Listed Buildings

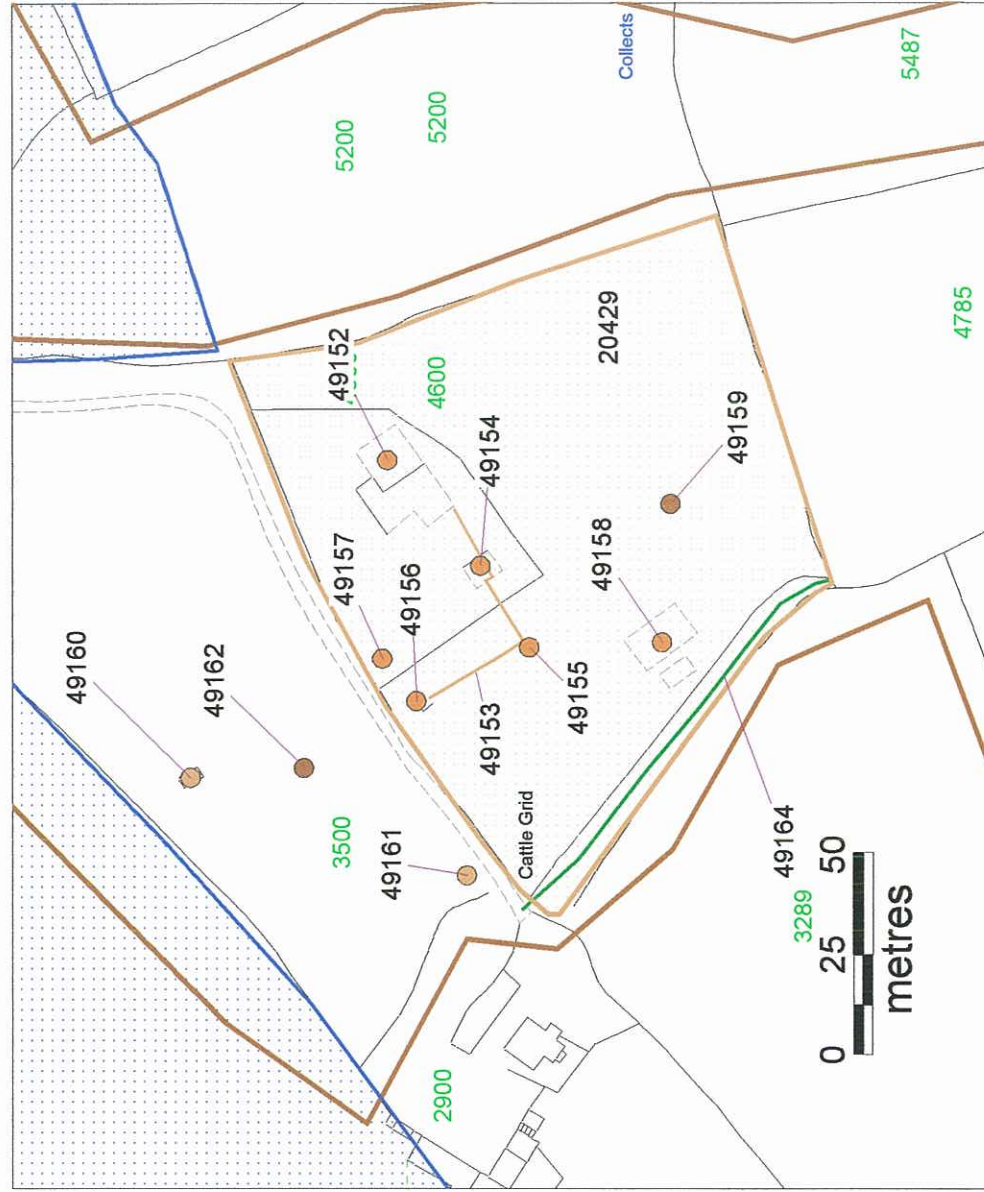
 Sites and Buildings of National Importance
 without a statutory designation

Site Category B - Regional Importance
 Sites and Buildings of Regional Importance
 including Grade 2 listed buildings

Site Category C - Local Importance
 Sites and buildings of Local Importance

Site Category D – Unknown Importance
 Sites requiring further investigation and sites with
 no physical definition

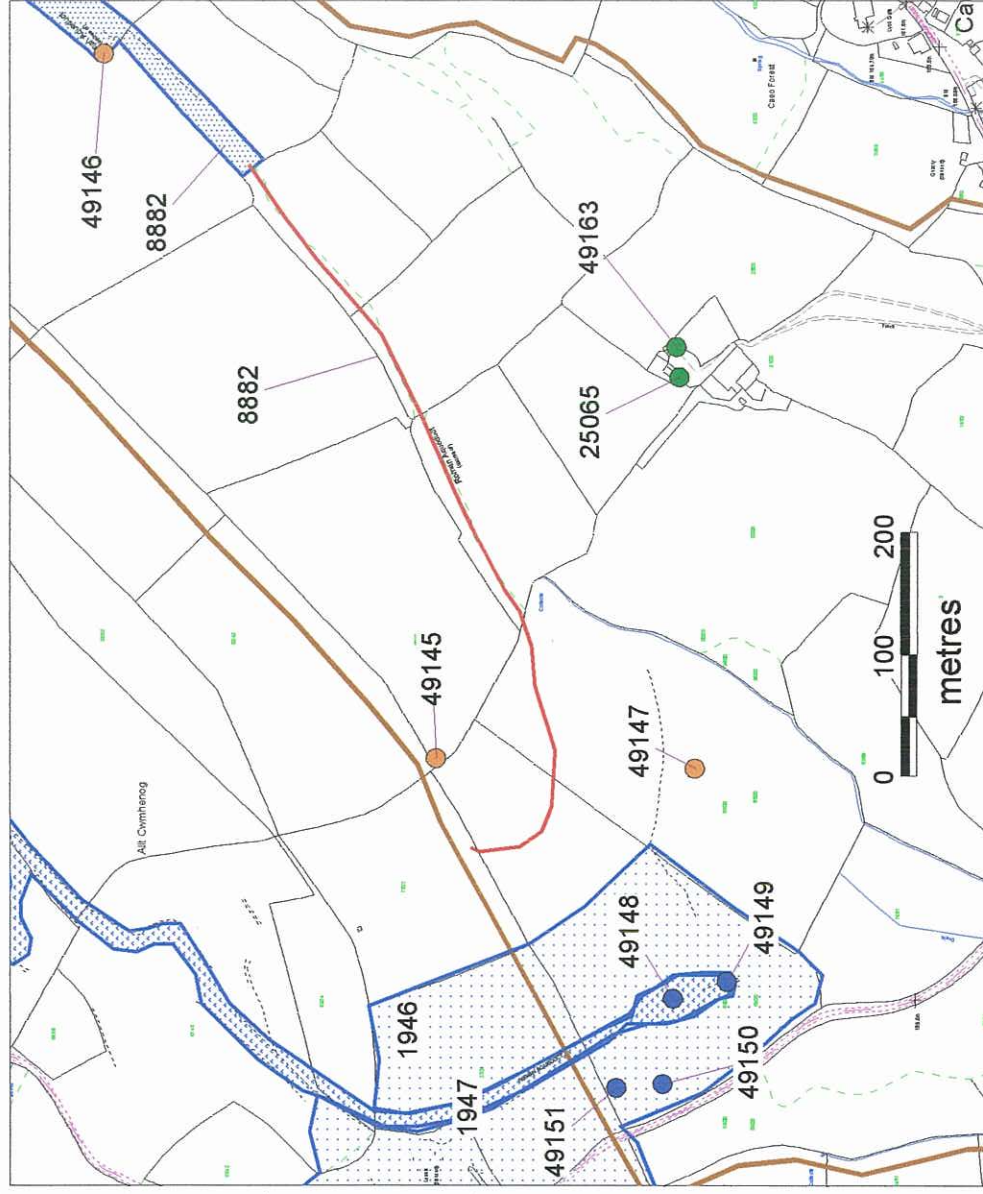
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Gwarnoehlle – the Roman mining features
 Tir Gofal Historic Environment Consultation
 Countryside Council for Wales Reference W/12/3796
 Cambria Archaeology Reference PRN47200
 National Grid Reference SN66754006

- Farm Boundary
- Historic Landscape Character Area
- Site Category A - National Importance**
 - Scheduled Ancient Monuments
 - Grade 1 and Grade 2* Listed Buildings
- Site Category B - Regional Importance**
 - Sites and Buildings of National Importance without a statutory designation
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 - Sites and buildings of Local Importance
- Site Category D – Unknown Importance**
 - Sites requiring further investigation and sites with no physical definition

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**GWARNOETHLE
W/12/3796**

REPORT NUMBER 2003/105

September 2003

This report has been prepared by Polly Groom

Position: Tir Gofal Archaeologist

Signature P. Groom Date 28/10/03

This report has been checked and approved by Louise Austin on behalf of Cambria Archaeology,
Dyfed Archaeological Trust Ltd.

Position: Principal Archaeologist (Curatorial)

Signature Louise Austin Date 27/10/03

As part of our desire to provide a quality service we would welcome any comments you may have
on the content or presentation of this report