# NANTYMWYN LEAD MINE HISTORIC ENVIRONMENT DESK BASED ASSESSMENT





Prepared by DAT Archaeological Services for The Coal Authority





# DYFED ARCHAEOLOGICAL TRUST

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# NANTYMWYN LEAD MINE HISTORIC ENVIRONMENT DESK BASED ASSESSMENT

By

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Paratowyd yr adroddiad yma at ddefnydd y cwsmer yn unig. Ni dderbynnir cyfrifoldeb gan Ymddiriedolaeth Archaeolegol Dyfed Cyf am ei ddefnyddio gan unrhyw berson na phersonau eraill a fydd yn ei ddarllen neu ddibynnu ar y gwybodaeth y mae'n ei gynnwys

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# NANTYMWYN LEAD MINE HISTORIC ENVIRONMENT DESK BASED ASSESSMENT

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# NANTYMWYN LEAD MINE

# HISTORIC ENVIRONMENT DESK BASED ASSESSMENT

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#### NANTYMWYN LEAD MINE

#### HISTORIC ENVIRONMENT DESK BASED ASSESSMENT

#### SUMMARY

DAT Archaeological Services were commissioned to provide a Historic Environment Desk-Based Assessment to inform proposals for environmental remediation work at the former lead mine of Nantymwyn, near the village of Rhandirmwyn, Carmarthenshire (centred on SN 7853 4466).

Following a summary of the long history of the mine, the assessment mapped and assessed known archaeological features and identified zones of archaeological sensitivity within a study area of approximately 23ha, that comprised mainly the Upper Boat level mine workings at Nantymwyn.

#### **CRYNODEB GWEITHREDOL**

Comisiynwyd Gwasanaethau Archeolegol YAD i ddarparu Asesiad ar Ddesg yr Amgylchedd Hanesyddol i hysbysu cynigion ar gyfer gwaith adfer amgylcheddol yn hen fwynglawdd plwm Nantymwyn, ger pentref Rhandirmwyn, Sir Gaerfyrddin (wedi'i ganoli ar SN 7853 4466).

Yn dilyn crynodeb o hanes hir y mwynglawdd, mapiodd ac asesodd yr asesiad nodweddion archeolegol hysbys a nododd ardaloedd o sensitifedd archeolegol o fewn ardal astudiaeth o tua 23ha, a oedd yn cynnwys yn bennaf y gwaith mwynglawdd Upper Boat Level yn Nantymwyn.

#### NANTYMWYN LEAD MINE

#### HISTORIC ENVIRONMENT DESK BASED ASSESSMENT

#### 1. INTRODUCTION

#### **1.1 Project Proposals and Commission**

- 1.1.1 DAT Archaeological Services were commissioned by The Coal Authority to provide a Historic Environment Desk-Based Assessment ahead of a Mine Water Treatment scheme at Nantymwyn lead mine near the village of Rhandirmwyn, Carmarthenshire (centered on SN7875644663) (Figure 1).
- 1.1.2 Nantymwyn lead mine comprises two distinct areas of working to the north and south of Rhandirmwyn village, known colloquially as the Upper Boat Level and Deep Boat Level respectively. This assessment covers the workings at the Upper Boat Level and some later workings to the east, situated on the southern side of the Nant y Bai valley whose stream flows in a south westerly direction through the mine workings. The assessment area comprises around 23ha in total (Figure 2).
- 1.1.3 The Nant y Bai is heavily contaminated with metals, failing European Water Framework Directive (WFD) standards for zinc, copper, lead and cadmium. It is also a significant source of metals to the Afon Tywi, causing the river to fail WFD standards for zinc and cadmium, with zinc remaining elevated for approximately 60km downstream of the mine. The discharge from the UBL is minimal and the primary source of the metals load in the Nant y Bai is diffuse runoff from the spoil tips and settlement lagoons.
- 1.1.4 In accordance with the brief supplied by the client this assessment includes but is not limited to:
  - A detailed breakdown of the known archaeology in the vicinity of the site;
  - An assessment of previous land use compiled from an analysis of historical maps, aerial photographs and other archive materials;
  - A listing of the heritage-related planning constraints that may affect the site;
  - A ranking of the potential for archaeology of each of the archaeological periods to be found within the site; and
  - Recommendations for future intrusive survey and construction excavation activities on site (requirements that would need to be in place during these or similar activities).
- 1.1.5 In addition, the assessment is intended to "be suitable to support a planning application and should identify any potential implications to the delivery of the proposed works; the report should consider any mitigation strategies to minimize any implications".

#### **1.2** Scope of the project

- 1.2.1 This assessment is presented as a fulfilment of the brief provided by The Coal Authority.
- 1.2.2 This assessment is limited to the parameters of the study area as defined by The Coal Authority and is not an assessment of Nany y Mwyn lead mine in its entirety. The mine workings at Deep Boat Level and that within the Nant Gwyn valley on Pen Cerrig Mwyn are excluded from this assessment but are referenced within a broader context and historical narrative of Nantymwyn lead mine.

- 1.2.3 The aim of this assessment is to characterise and map the known archaeological resource and to assess the archaeological potential of Nantymwyn mine workings and connected infrastructure within the parameters of the study area. Archaeological constraints are presented as an illustrative plan with a supporting narrative.
- 1.2.4 The study area was visited to assess and verify the presence or absence of archaeological remains, and to identify any previously unrecorded assets within the bounds of each study area.
- 1.2.5 This assessment should be considered the first stage of the archaeological process and does not preclude the possibility that further archaeological mitigation may be required prior to, or during, any programme of remediation works.
- 1.2.6 The report complies with the Standard and Guidance for an Archaeological Desk-Based Assessment (Chartered Institute for Archaeologists (CIfA 2014) and abides by their Codes of Conduct (CIfA 2014).

# **1.3** Abbreviations used in this report

1.3.1 All sites recorded on the regional Historic Environment Record (HER) are identified by their Primary Record Number (PRN) and located by their National Grid Reference (NGR). Sites recorded on the National Monument Record (NMR) held by the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) are identified by their National Primary Record Number (NPRN). Scheduled Monuments (SM) are recorded by a SM number. Altitude is expressed to Ordnance Datum (OD). References to cartographic and documentary evidence and published sources will be given in brackets throughout the text, with full details listed in the sources section at the rear of the report.

#### 1.4 Illustrations

1.4.1 Printed map extracts are not necessarily reproduced to their original scale and are illustrative only.

# 1.5 Timeline

1.5.1 The following timeline is used within this report to give date ranges for the various archaeological periods that may be mentioned within the text (Table 1).

	Approximate date	Period
σ	<i>c</i> .450,000 – 10,000 BC	Palaeolithic –
ret	<i>c</i> . 10,000 – 4400 BC	Mesolithic –
nist	<i>c</i> .4400 – 2300 BC	Neolithic –
öri	<i>c</i> .2300 – 700 BC	Bronze Age –
ō	c.700 BC – AD 43	Iron Age –
	AD 43 - <i>c.</i> AD 410	Roman (Romano-British) Period –
-	<i>c</i> . AD 410 – AD 1086	Post-Roman / Early Medieval Period –
list	1086 - 1536	Medieval Period –
öri	1536 - 1750	Post-Medieval Period $^1$ –
0	1750 - 1899	Industrial Period –
	20th century onwards	Modern –

**Table 1:** Archaeological and Historical Timeline for Wales

<sup>&</sup>lt;sup>1</sup> The post-medieval and industrial periods are combined as the post-medieval period on the Regional Historic Environment Record as held by Dyfed Archaeological Trust

#### 2. NATIONAL POLICIES AND GUIDANCE

# 2.1 The Historic Environment (Wales) Act

- 2.1.1 The Ancient Monuments and Archaeological Areas Act 1979 was previously the primary legislation for protecting archaeological remains and scheduled monuments. This has more recently been amended by The Historic Environment (Wales) Act 2016 which has three main aims as defined by Cadw:
- to give more effective protection to listed buildings and scheduled monuments;
- to improve the sustainable management of the historic environment; and
- to introduce greater transparency and accountability into decisions taken on the historic environment.
- 2.1.2 The new Act amends the Ancient Monuments and Archaeological Areas Act 1979 and also the Planning (Listed Buildings and Conservation Areas) Act 1990. It is supported by a number of planning guidance documents. The Act most specifically provides better safeguards for the protection of scheduled monuments, listed buildings and historic parks and gardens. It also includes further guidance on place names.

#### 2.2 Planning Policy Wales

- 2.2.1 Planning Policy Wales (Edition 11, February 2021) sets out the Welsh Government's land use planning policies. Its primary objective is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales, as required by the Planning (Wales) Act 2015, the Well-being of Future Generations (Wales) Act 2015 and other key legislation.
- 2.2.2 Chapter 6.1, 'Recognising the Special Characteristics of Places, explains how planning systems must take into account the Welsh Government's objectives to protect, conserve, promote and enhance the historic environment as a resource for the general well-being of present and future generations. It states that:

The historic environment comprises all the surviving physical elements of previous human activity and illustrates how past generations have shaped the world around us. It is central to Wales's culture and its character, whilst contributing to our sense of place and identity. It enhances our quality of life, adds to regional and local distinctiveness and is an important economic and social asset.

It also sets out the planning policies for the sustainable management of specific categories of historic environment assets.

# 2.3 Technical Advice Note 24: The Historic Environment

- 2.3.1 This technical advice note provides guidance on how the planning system considers the historic environment during development plan preparation and decision making on planning and Listed Building consent applications. It also provides specific guidance on how the following historic environment assets should be considered:
- scheduled monuments
- archaeological remains
- listed buildings
- conservation areas
- historic parks and gardens
- historic landscapes

- historic assets of special local interest
- World Heritage Sites
- 2.3.2 The technical advice note usefully gathers together the selection criteria employed in the designation of scheduled monuments and listed buildings and the registration of historic parks and gardens and historic landscapes.
- 2.3.3. Advice and decisions on planning applications affecting nationally significant historic environment features (or designated historic environment assets) is provided by Cadw acting on behalf of Welsh Government.
- 2.3.4 This report will also make reference to other guidance documents published by Cadw, namely: Conservation Principles (March 2011); Heritage Impact Assessment in Wales (May 2017); Managing Historic Character in Wales (May 2017); and Setting of Historic Assets in Wales (May 2017).

# 3. LOCAL PLANNING POLICIES

#### 3.1 Local Development Plan

- 3.1.1 The Carmarthenshire Local Development Plan (LDP) was adopted in December 2014, and sets out the planning development strategy for the area. The LDP policies are set out in line with national policy and guidance outlined above, but applies a rational and consistent basis for decision making at local level.
- 3.1.2 Policy SP13 addresses the protection and enhancement of the built and historic environment. It states that proposals relating to historic/culturally important sites and features, such as listed buildings, conservation areas and Scheduled Ancient Monuments (SM), will be considered in line with national guidance and legislation.

# 4. LOCATION

# 4.1 Site location

- 4.1.1 Nantymwyn former lead mine is located near the village of Rhandirmwyn, some 10km north of the market town of Llandovery in Carmarthenshire (Figure 1). The mine comprises two distinct regions located to the north and south of Rhandirmwyn village; known colloquially as the Upper Boat Level and Deep Boat Levels respectively. The Upper Boat Level workings are extensive and are situated along the southern side of the Nant y Bai valley whose stream originates from the northeast, on the steep slopes of Pen Cerrig Mwyn. The Deep Boat Level workings are located to the southwest of the village, with associated workings located within the Nant Gwyn valley, along which flows the Nantymwyn stream. Further workings extend from this valley and are concentrated to the southeast of the craggy outcrops of Pen Cerrig Mwyn (Figure 2).
- 4.1.2 Both watercourses drain into the Afon Tywi and are heavily contaminated with heavy metals, failing European Water Framework Directives standards for zinc, copper, lead and cadmium. The Nantymwyn is the greater contributor of zinc and cadmium to the river Tywi, whilst the Nant Y Bai is the greater contributor of lead. The water discharge from the Upper Boat Level is considered minimal, with the primary source of the contaminants in the Nant y Bai to be diffuse runoff from the spoil tips and settlement lagoons (NRW, 2014a). The Deep Boat Level is the primary source of metals to the Nantymwyn with additional smaller inputs further upstream in the Nant y Gwyn valley (NRW *ibid*).
- 4.1.3 The underlying geology of Nantymwyn lead mine is laminated mudstone of Silurian and Ordovician age. The Abergwesyn fault cuts across the assessment area where it splits, creating a steep anticline where the folding rich quartzite vein forms the Pen Cerrig Mwyn ridge east of the Upper Boat Level mining area (Brabham and Umar, 2011). Studies of historic mine plans indicate that the principle lead orebody, the middle lode, is located along the fault lines in near vertical (or very steeply dipped to the west) quartz veins. It is common for lead and zinc ores in Wales to occur as veins or lodes associated with faulting (Atkins, 2011). There are two smaller orebodies which are located along a north-south fault zone, towards the southeast of the Upper Boat Level workings which are commonly referred to in the literature as Roderick's and Cowling's lodes (*ibid*).

# 4.2 The study area

- 4.2.1 The study area encompasses an area of extensive mine workings at Upper Boat Level measuring around 23ha in total. The Nant y Bai somewhat defines the northern boundary of the study area and the remainder boundary is enclosed by forestry plantation. The mine is accessed from the west by forestry tracks which weave up the contours of the ascending topography.
- 4.2.2 The study area itself can be divided into two distinct parts namely a narrow corridor of tailings and ruinous buildings associated with the now collapsed Upper Boat Level portal located within the western part of the study area. The eastern part comprises a larger area of workings which once contained several adits and shafts, and is now dominated by spoil tips, reservoirs, concrete platforms and ruined buildings of late 19<sup>th</sup> and early 20<sup>th</sup> century date but also includes vestiges of earlier phases including a number of shafts and craters. This area also includes the scheduled remains of Angred Engine House, Shaft and Chimney (SM No CM215).
- 4.2.3 Nantymwyn is an area of significant heritage value and is also a Site of Special Scientific Interest (SSSI). The Mwyngloddfa Nantymwyn SSSI is an important site both for its mineralization and for the metallophyte mosses, liverworts, and lichens which favour this unique environment created by this mineralization (NRW, 2014b).

- 4.2.4 In general, the surface archaeology within the western part of the study area, around Upper Boat Level, is complex though largely extant and discernible. There are a number of ruined buildings, some partially buried by weathered spoil tips whilst elsewhere timber structures and remnants of stone built features have been made visible by the erosive action of the Nant y Bai on surrounding deposits of tailings.
- 4.2.5 The eastern part of the study area is much more complex and the final phases of ore processing, as well as the creation of forestry and its infrastructure during the 20<sup>th</sup> century, have created a confusion of tips and intrusions into earlier phases of workings in this area. The most robust and visible surface archaeology within this area dates to the 19<sup>th</sup> and 20<sup>th</sup> centuries, whereas much of the earlier workings are more ephemeral making them more difficult to identify and interpret.
- 4.2.6 It is clear that many of the heritage assets within the study area are vulnerable to the effects of water and are actively being eroded. The agents of this erosion are twofold; firstly by the pooling and runoff of surface water and secondly, by the more persistent action of the Nant y Bai.

# 5. METHODOLOGY

# 5.1 Archaeological Assessment

- 5.1.1 The archaeological assessment has been prepared in accordance with the client brief and using the following sources of information:
  - Dyfed Archaeological Trust Historic Environment Record data and other relevant information (including a review of online information held on the RCAHMW Coflein site) minimum search area was that as defined within the tender documentation;
  - Identification of any Scheduled Monuments, Listed Buildings, Conservation Areas or Historic Landscape Areas within or in the vicinity of the site area from information held by Dyfed Archaeological Trust, CADW and NRW – 100m search buffer;
  - Readily available bibliographic information, cartographic material and photographs (including aerial photographs) held at the Trust;
  - A review of historic maps to include a map regression exercise;
  - A review of 25cm LiDAR captured in December 2020 and provided by The Coal Authority;
  - Relevant web-based information;
  - Site visit and walkover survey;
  - A consideration of underground features of the mines; and
  - Assessment of the archaeological potential of the area.
- 5.1.2 The report complies with the Standard and Guidance for Archaeological Desk-Based Assessments (CIFA 2014).

#### 5.2 Site Walkover Survey

5.2.1 A site walkover of the study area at Nantymwyn lead mine was undertaken on 28th January 2021 by Menna Bell and Fran Murphy. All accessible areas of study area were visited and photographed. Field notes and NGRs captured by a hand held GPS were also recorded.

# 6 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

#### 6.1 Historic Landscape

6.1.1 Nantymwyn lead mine falls within the Tywi Valley Registered Historic Landscape (HLW (D) 5) recorded on the Register of Landscapes of Outstanding Historic Interest in Wales (Cadw 1998), and is summarised as:

The Tywi valley extends south westwards from the source of the river in the south of the Cambrian Mountains, through Mynydd Mallaen and the low, rolling hills and ridges of Carmarthenshire, to its estuary mouth in Carmarthen Bay. The valley is some 90km in length and of varying widths, but rarely more than a kilometre wide across the valley floor. The Vale of Towy or Dyffryn Tywi is generally understood to extend from Llandovery to Carmarthen, but the area identified here is the geographical entity of the valley, valley floor, flood plain and hills on either side, which extends from the Llyn Brianne reservoir near the headwaters, to the estuary. The principal significance of the valley is as setting for a unique group of planned parks and gardens, and its historic, artistic associations with the Picturesque which are best summarised in John Dyer of Aberglasney's locodescriptive poem Grongar Hill published in 1726: 'Now, I gain the mountain's brow, What a landskip lies below! No clouds, no vapours intervene, But the gay, the open scene Does the face of nature show, In all the hues of heaven's bow! And, swelling to embrace the light, Spreads around beneath the sight. Old castles on the cliffs arise, Proudly tow'ring in the skies! Rushing from the woods, the spires Seem from hence ascending fires! Half his beams Apollo sheds On the yellow mountain-heads! Gilds the fleeces of the flocks: And glitters on the broken rocks!' This descriptive tradition continued through the 19th and into this century, and as a result there is a widespread popular sense of the Tywi valley as a cherished landscape. Late 17th and early 18th centuries artistic and poetic perceptions were fostered by their patrons, the county gentry. The area was dominated, but not exclusively, by the Vaughans of Gelli Aur and their many cadet branches who increasingly preferred to site their houses and mansions to take advantage of the scenic prospects of the valley. The 18th and 19th centuries gentry families were in many cases descended from the Welsh uchelwyr (noblemen) of the 15th to 17th centuries, whose ancestry, descent and houses have been chronicled by the late Major Francis Jones, the Wales Herald, Jones makes constant use of the descriptions of houses and their settings by such late medieval bards as Lewis Glyn Cothi whose cywyddau (stanzas) give a sense of medieval landscape values in this area. Despite destruction and neglect, the area still contains many important houses and mansions, and new discoveries continue to be made. The area was also the heartland of Ystrad Tywi. Much of this territorial unit remained in Welsh control under Lord Rhys and his descendants until late in the 13th century, albeit one heavily fought over. The legacy of stone castles as well as earth and timber mottes and planted medieval boroughs still dominate the landscape. Some survived and developed, but others, like Dryslwyn and Dynevor Newton, did not. The siting of castles and boroughs, like the earlier Roman military strongpoints of forts, have been dictated by that constant necessity in river valleys of communications, and the consequent desire both to establish and to control them. The River Tywi is a particularly active one and subject to radical course changes across its valley floor. This has affected both

linear and crossvalley roads, fords and bridges, and gives depth and complexity to the surviving pattern of Roman and medieval routes, and to early modern turnpike, road and rail lines. The heavy concentration on grazing of modern and early modern farming in the valley floor, in what the Land Utilisation Survey of Britain described in 1946 as 'the best quality dairying land in the county', may overlay relict landscape and buried palaeo-environmental evidence for more diversified, earlier agricultural régimes. Certainly surviving areas of ancient woodland and medieval documentary evidence on forest-based economic régimes suggest heavily wooded valley sides. The prehistoric environment and settlement patterns of the Tywi valley are the least known. It is however apparent from small-scale, ad hoc, archaeological work that there are glacially deposited raised areas of ground on the valley floors, with potential prehistoric settlement and land use information. Evidence for Iron Age occupation on the lower valley sides and valley floors is at present lacking to complement the pattern of large, infrequently sited hillforts such as Carn Goch and Merlin's Hill overlooking the valley.

6.1.2 The Deep Boat Level mine area falls within the Rhandirmywn Historic Landscape Characterisation (HLC) area summarised in Volume 1 of 'Carmarthenshire Historic Landscape Characterisation' (Murphy & Ludlow, 2000) as:

An area in the foothills of the Cambrian Mountains either side of the headwaters of the River Tywi, which formed the boundary between Cantref Bychan to the east and Cantref Mawr to the west. Cantref Bychan was invaded by the Anglo-Normans under Richard Fitz Pons who established a caput at Llandovery in 1110-16 and was acquired soon after by the Clifford lords of Brecon as the Lordship of Llandovery. Cantref Mawr remained an independent Welsh lordship until 1284. Both retained native tenurial customs until the end of the Medieval period when they were united within modern Carmarthenshire. Much of the area east of the Tywi lay within the Manor of Nant-y-bai, which had been granted as a grange to the Cistercians of Strata Florida, probably by Gruffydd ap Rhys in c. 1200. The nucleus may have lain at Bron-y-cwrt. It was an upland grange, probably operated by tenant farmers primarily concerned with the mountain pasturing of animals, although the present mill has origins as a Medieval corn mill indicating that arable was undertaken in pockets of good soil. The name Rhandirmwyn contains a "shareland" element (rhandir), suggesting that the tenants held their land by inheritance, with perpetual right to their holdings. The manor continued after the Dissolution as the Ystrad-ffin estate. A survey of 1629 shows that its contained most of the surrounding farms and demonstrates that the present settlement pattern was more-or-less already in place; the present system of medium-sized irregular fields may also have been established. Pwll-priddog, which has Medieval origins, was held separately from both the manor and the grange by the Morgan family. The area is chiefly characterised by former lead mining which may have begun under the Cistercians, or even the Romans; it was certainly undertaken in this area by the late 13<sup>th</sup> century, the crown taking the "eleventh foot" of the ore in taxation. This would imply that a mining community, of unknown size, may have existed in the vicinity of Rhandirmwyn and Nant-ybai. Rhandirmwyn may have been comparatively large by the 18<sup>th</sup> centurypossibly exceptional by local standards – as the mines employed 400 workers in 1791 and the present nucleation features worker terracing, and the new church of St Barabas from the mid-19th- century. Lead mining ceased in the early 20th century. The presence of coal is noted in the place name "Nant- y- glo" and a guarry operated in the southern part of the area. The later 19<sup>th</sup> and 20<sup>th</sup> century have mainly been characterised however, by scattered development of cottages and dwellings. A sewage works has been erected to the south of Rhandirmwyn.

#### Description and essential historic landscape components

Rhandirmwyn character areas lies in the upper Tywi valley where the sides open out to form a large bowl-shape. The valley floor lies at between 100m and 120m, and the valley sides within this area rise to over 180m. This is a complex area as it consists of small irregular fields, dispersed farms, woodland and conifer plantation, lead mines and their associated communities, and 19<sup>th</sup> and 20<sup>th</sup> century cottages and houses. Improved pasture is the dominant land-use within the system of small, irregular fields, but large pockets of rough and rushy ground are present, particularly towards the valley floor. Boundaries consist of earth banks topped with hedges. Hedges are in poor condition with less than 50% stockproof. Most are either overgrown or derelict. Wire fences supplement the hedges. Many of the hedges have distinctive trees, and these together with the numerous deciduous copses and small conifer plantations lend a wooden aspect to the landscape. The ancient settlement pattern in this area comprises dispersed farms. These are stone-built with slate roofs, and generally date to the 19<sup>th</sup> century. Most are two-storeys with three bays and tend to be in the vernacular tradition, though examples in a more polite Georgian style are present. Stonebuilt outbuildings are present at most farms, as are large agricultural buildings. Remains of the lead mining industry lie mainly outside this area, but Rhandirmwyn community which grew up to serve it is located here. It consists of dispersed stone-built dwellings and chapels of 19<sup>th</sup> century date. Individual houses and cottages are present, as are terraces of two-storey and single storey houses. Stone-built worker cottages of 19<sup>th</sup> century date, and 20<sup>th</sup> century brick built worker houses are situated in isolated locations alongside roads away from the main community. Recent housing consists of individual dwellings.

Recorded archaeology chiefly comprises lead mining features and buildings, but includes a Bronze Age standing stone and round barrow, and two possible barrows, an Iron Age hillfort and possible Medieval well and chapel sites. There are a number of distinctive buildings but few of them are listed.

6.1.3 The Upper Boat Level mine area is located within the Craig y Bwch HLC and is summarized as:

Craig y Bwch lay within the Manor of Nant-y-bai, which had been granted as a grange to the Cistercians of Strata Florida, probably by Gruffydd ap Rhys in c.1200. It was an upland grange, probably operated by tenant farmers primarily concerned with the mountain pasturing of animals. The manor of Nant-y-bai remained together after the Dissolution as the Ystrad-ffin estate. Its appears to have been unenclosed during the historic period, as it is today and is depicted as open pasture on the earliest historic maps. The is physical evidence for former human occupation of this upland area. There are also a number of former longhuts, characteristic of upland settlement in southwest Wales during transitional, early Post-Medieval- modern period, and former cottages from the 18h- and early 19<sup>th</sup>- century. The area is characterised by evidence for former lead mining which may have begun under the Cistercians. It was definitely being undertaken in this area by the late 13<sup>th</sup>-century, the crown taking the "eleventh foot" of the ore in taxation; mining ceased from the mid-19<sup>th</sup>-century. The presence of coal is noted in the place name "Nant-y-glo" and quarries area also present. The area has no recent settlement, but the weir and overflow for Llyn Brianne reservoir, constructed at the northern edge of the area during the 1960s, has had a profound effect on the landscape.

Craig y Bwch is a distinctive character area. It is bounded to the west and south be enclosed farmland of the floor of the Tywi valley, to the east and northeast by

an extensive upland forestry plantation, and to the north by Llyn Brianne reservoir.

#### Description and essential historic landscape components

Craig y Bwch character area lies on the eastern side of the upper Tywi valley. From the valley floor at approximately 200m, the valley sides rise steeply to over 400m, and the continue to rise onto and undulating plateau at over 470m. The area is unenclosed. Valley sides are craggy, and the plateau is wet and boggy. Bracken lies on the steep slopes. The plateau is dominated by rough grazing interspersed with pockets of improved land. Quarries and mines, with tramways leading diagonally down the valley side, provide one of the few distinctive manmade features of the landscape.

Recorded archaeology provides a time-depth represented by Bronze Age round barrows, while there are longhuts, former cottages and dwellings, and lead mine features from the Post-Medieval period.

#### 6.2 Historical Development

- 6.2.1 Nantymwyn lead mine is considered the most important non-ferrous metal mine in South Wales although it has received a modest amount of scholarly attention and scant archaeological study. It is also a popular location for historic mine enthusiasts and cavers as evidenced by its appearance within discussions and photographic galleries published on the mine exploration and mining history website and forum *AditNow*<sup>2</sup> which includes a detailed description of it's accessible subterranean components.
- 6.2.2 The most comprehensive historical narrative of the mine is provided by Simon Hughes writing in the journal of British Mining in 1992 (Hughes, 1992) and is largely based on primary accounts and secondary studies provided by W. J Lewis (Lewis, 1967) and George Hall (Hall, 1971). Hall later provides a concise narrative following a field trip undertaken by members of the Welsh Mines Society in 2011 (Hall, 2011). A key text which attempts to provide a spatial understanding alongside a historical narrative of the mine is provided by Peter Brabham and Bappah Umar, supervisor and MSc student from the School of Earth & Ocean Sciences at Cardiff University (Brabham and Umar, 2011). The reader is encouraged to refer to these texts for a more comprehensive and detailed historical account of Nantymwyn lead mine in its entirety. The following summary of the historical development of the mine is derived from these sources and concerns only the most relevant components and phases of the Upper Boat and Deep Boat Level areas which are intrinsically linked. The main features and phasing pertaining to the Upper Boat Level study area are shown in Figure 3.
- 6.2.3 The earliest evidence for prospecting and extraction at Nantymwyn is generally attributed to Roman mining activity and possibly even earlier, owing largely to its proximity to the well documented Roman mining at Dolaucothi Goldmines at nearby Pumpsaint which date from the 1<sup>st</sup> to 4<sup>th</sup> centuries. Hushing gulleys, tanks and leats have been identified from aerial photography at either end of the Pen Cerrig Mwyn outcrop, outside of existing forestry. These are indicative of pre-industrial mining techniques and have similarities with mining features confirmed at Dolaucothi. Indeed, vertical aerial photographs taken by the RAF in 1946 clearly show hushings at the southern end of Pen Cerrig Mwyn, within the Nant Gwyn valley. Further possible hushings, partially buried by later soil tips are also visible at the northeastern extent of the Upper Boat Level workings, northwest of

<sup>&</sup>lt;sup>2</sup> <u>Nantymwyn Lead Mine information and photos (aditnow.co.uk)</u>

the Pen Cerrig Mwyn ridge (Figure 4). There has been a small number of archaeological investigations on features southwest of the Pen Cerrig Mwyn ridge, including small scale excavation which yielded radiocarbon dates obtained from charcoal as  $1080 \pm 60$  BP (cal AD 865-1035) and elsewhere basal peat infilling a leat as  $1450 \pm 60$  (cal AD 520 - 680) (Timberlake, 2002). Whilst the former assumes evidence for Early Medieval activity, the latter, given a reasonable allowance for the peat formation, may provide the most tangible, though tenuous, evidence for late Romano-British activity.

- 6.2.4 Elsewhere, the general consensus is that the earliest definitive mine workings are that associated with Roderick's Lode in the Nant Gwyn valley and northeast of the village of Rhandirmwyn. The earliest documented evidence for lead mining at Nantymwyn dates from the reign of Henry VIII when "Peter the German" on behalf of the King's mining commissioners, made reference to an old mine in the area eligible for paying royalties. The mine was later leased in 1641. Level Tan, a shallow adit system located at the northern most extent of the Upper Boat Level workings and study area, is thought to originate from this time, if not slightly earlier.
- 6.2.5 Later references occur from 1742 onwards and it is thought that the deeper Maescarhyg adit whose portal was also in the Upper Boat Level area, was driven around 1750. There is some discussion in Hughes' narrative of there being a short-lived smelting works near the portal of Maescarhyg adit and opposite the (now ruinous) White Hall Uchaf farmstead. In his 2011 account, Hall reiterates the presence of a smelting house and accompanying stamp mill (for crushing the ore) in this vicinity.
- 6.2.6 In 1775 the mine became part of the Earl of Cawdor's estate at which point it must have been hugely productive for the ore was sent to purpose-built smelters in Carmarthen. Smelting such quantities of ore required significant amounts of coal and Carmarthen being closer to coalfields than Nantymwyn would have been a more economic choice. It is during this period between 1770-1780, that the 365m long Upper Boat adit and level system were driven. The level was flooded to allow the transport of ores by narrow boats to the dressing floors. The canals wharfs, dressing floor and water-powered crushing mill are depicted in a watercolour painting by the artist John "Warwick" Smith" who visited the mine in 1792. Smith described the scene as "Interior of the mining part of Carreg Mowyn where the lead ore is principally carried in boats through narrow level communications branching from the mines The boats used in this subterraneous navigation are narrow & sharp at each end & of about 5 tons- one man brings out several of these, sometimes using a paddle, sometimes grappling with the rock with his hands, but their favourite method is by laying down on their backs & with their feet ag[ain]st the roof, forcing the boats along- The buildings are adapted for a stamping mill & a corn mill for the miners". This painting is held at the National Library of Wales and has now been digitized for online viewing<sup>3</sup>. It is reputed that the mine employed around 400 people at this time.
- 6.2.7 Primary sources indicate that by 1780 the underground workings amounted to many miles of horizontal levels linked by winzes and ladders. Deep Boat Level was driven northwards from just south of the village of Rhandirmwyn in 1785,
- 3

https://viewer.library.wales/1443296#?c=&m=&s=&cv=&manifest=https%3A%2F%2Fdamsssl.llg c.org.uk%2Fiiif%2F2.0%2F1443296%2Fmanifest.json&xywh=1780%2C1578%2C3825%2C2357

some 54m below Upper Boat Level and at 730m in length it took 13 years to complete.

- 6.2.8 Production at the mine reached peak profitability in the early 19<sup>th</sup> century and continued amidst fluctuating lead prices and a diminished workforce into the latter half of the century. Further levels were driven some 60m below Deep Boat Level during this period. Subsequent extraction of the orebody was limited to the existing mining levels and vertical shafts in the Upper Boat Level workings. Accessing levels such as the Maescarhyg and Middle levels were likely sunk during this period.
- 6.2.9 The next most notable development was the sinking of the Angred Shaft to Deep Boat Level and the construction of the steam driven beam engine pump house sometime after 1887. The shaft was sunk to a final depth of 69m below Deep Boat Level where it terminated at a water sump. The Angred Shaft and Engine House are now a Scheduled Monument (CM215). Around the same time a second shaft, Jones' Shaft, was sunk 25m to intersect with the Deep Boat Level at Rhandirmwyn. Coal was lowered down the shaft onto the canal boats at this level which then transferred the coal to the Angred Shaft where it was hauled to the surface to fuel the steam engine. It seems however, that this endeavor was short lived for the plant, engine and boilers were removed by 1900 when the mine lease was relinguished, and production stopped.
- 6.2.10 The lease was renewed in 1914 and the Nantymwyn Mine Co. Ltd was established. During this period the Deep Boat Level was drained, replacing the canals with tramways and wagons to transfer ore to the surface. Access to the shallower workings at Upper Boat Level was also improved by driving the Footway adit from the surface sometime after 1916. Operations continued on a limited basis until 1925 when The Sulphide Corporation, an Australian enterprise bought 50% of the Nantymwyn Mine Company's shares. The emphasis was now on the extraction of zinc ore, as well as its recovery from the large tips of tailings.
- 6.2.11 In 1929 a new power plant and flotation mill were constructed to the north of the Angred Shaft and Engine House, and New Shaft was sunk to the Deep Boat Level. A new crushing mill, using plant removed from the mill at Upper Boat adit portal according to Brabham and Umar (*ibid*) or at Deep Boat Level according to Hughes (ibid), was also constructed. Between June and October 1930, over 6000 tons of tailings was milled. The lead and zinc were separated by a process of fine grading followed by froth flotation to produce a fine-grained residue. Production came to an abrupt close at the end of the October owing to disappointing recoveries and the economic impacts on the prices of lead and zinc owing to the onset of the Great Depression. Operations were then turned to resampling some of the old workings and the clearing out and rehabilitating the levels which had deteriorated into poor and dangerous conditions. A photograph taken in 1930 included in Brabham and Umar's report (*ibid*) and reproduced in Figure 5, shows the operations at New Shaft and flotation mill. It shows a neat arrangement of buildings nucleated around the mills and headshaft and the expanse of tips, including a large spoil tip in the foreground of the scene, beyond which the top of the Angred Engine House and chimney can just be seen.
- 6.2.12 The mine went into liquidation in 1932, much of the plant was dismantled and shipped to South Africa. All the accessible mine adits were reportedly blocked up. The company was eventually wound up in 1937. The mine abandonment plan produced in 1932 (and indeed the 1876 plan) is generally considered to be under representative of the true extent of remaining mine features (Coal Authority refs OM4077 and OM10856).

- 6.2.13 In subsequent years many of the mine workings have suffered collapses, including Upper Boat Level, although this was reportedly still accessible in 1942 during a survey undertaken by the British Geological Survey with a view to reopen it for the war effort (it was not). With the pumps removed, many of the levels have now flooded, including the Upper Boat and Deep Boat Levels. However, not all levels were rendered completely inaccessible and there have been many explorations made by mine/caving enthusiasts since the 1960s. None, however, are accessed from the Upper Boal Level mine workings.
- 6.2.14 In 1966, Nantymwyn was bought from the Cawdor Estate by the Economic Forestry Group. A little while after, construction began on the Llyn Brianne dam and large quantities of mine tailings were removed and used in the construction of the dam. An area around the Deep Boat Level adit equating to roughly 2.5ha was cleared of tailings; an area that is now a caravan park. It seems that little material was removed from the Upper Boat Level adit area.
- 6.2.15 The planting of forestry commenced in the early 1970s at which time much of the tailings at Upper Boat Level were removed or bulldozed flat to aid the construction of the forestry tracks still extant today. The slopes of Pen Cerrig Mwyn were also ploughed ahead of planting, damaging, and removing evidence of the most ephemeral surface archaeology and creating a confusion of spoil tips and other features.
- 6.2.16 At the time of writing this report forestry plantation was being cleared at the northeastern extent of the study area, revealing a number of depressions and features that have not been visible since the early 1970s.

# 6.3 Recorded Archaeology

# Designated Scheduled Monuments

6.3.1 There is only one Scheduled Monument (SM) within the Nantymwyn study area, and 100m search buffer. It is Angred Engine House (Figure 6):

SM No	SM No SM Name		NGR	Site Type
CM215 Nantymwyn Lead		Post-Medieval	SN7871844496	Engine
	Engine House			House

**Table 2:** Scheduled Monuments within the Nantymwyn study area and 100m search<br/>buffer.

6.3.2 SM CD215 Nantymwyn Engine House and associated structures (PRN 61156) is located in the south-eastern corner of the study area, east of the Angred Shaft (PRN 99339). The scheduling area includes a now roofless stuccoed masonry engine house, an adjacent masonry boiler house, masonry Cornish chimney stack with redbrick upper section, main pumping shaft with two associated conical tips and the site of a small reservoir (PRN 125678) to the south west of the boiler house which was used as a feeder reservoir for the boiler.

# Designated Listed Buildings

6.3.3 The Nantymwyn Engine House and chimney are also Grade II Listed Buildings (Figure 6). This is the only listed building within the study area and 100m search buffer:

PRN Number	Listing	Name	NGR	Grade
61156	21417	Engine house and chimney at Nantymwyn lead-mine	SN7871844496	II

**Table 3:** Listed Buildings within the Nantymwyn study area and 100m searchbuffer.

#### Non-designated archaeological assets

6.3.4 Consultation of the Historic Environment Record (HER) and National Monuments Record (NMR) held by the RCAHMW revealed 70 non-designated archaeological assets within the Nantymwyn study area and 100m search buffer. These records are presented in Appendix I and shown in Figure 7. Those assets held within the HER are listed by PRN, those held within the NMR by NPRN. Unless otherwise stated all assets listed in Appendix I are of Post-Medieval date. Archaeological assets discussed in further sections of this report are referenced by their PRNs.

#### Non-designated newly identified archaeological assets

6.3.5 A further 29 archaeological assets have been identified as a result of the deskbased assessment and/or the site visit. All of these assets are located within the Nantymwyn study area and 100m search buffer. These assets have subsequently been recorded on the HER and have been allocated PRNs. These new assets are presented in Appendix II and shown in Figure 7. Almost all of the records relate to previously unrecorded extant features whilst the remainder reference features evidenced by documentary sources.

#### 6.4 Map Regression and Aerial Photography

# *Llanfair ar y Bryn Tithe Award map of 1868* (Figure 8)

- 6.4.1 The tithe map presents a misleading impression of the scale of industry at this time. The purpose of a tithe map was not topographic accuracy but to record ownership of land within the parish for the purpose of tax collection. Any irrelevant information was often omitted or included with varying detail and accuracy.
- 6.4.2 The mine operations are not presented and the land is shown as largely unenclosed. It is possible to trace the course of the Nant y Bai and the small black blocks located on the northern side of the stream correlate to White Hall *isaf* and *uchaf* farmsteads. Also shown is Angred farmstead near the Upper Boat Level. Finally, two small blocks located at the northern extent of the study area, and opposite White Hall Uchaf, may indicate the dressing floor at the Maescarhyg Level.

#### Ordnance Survey 1<sup>st</sup> edition 25" map published in 1888 (Figure 9)

6.4.3 At the time of the publication of the first edition 25" Ordnance Survey map in 1888 Nantymwyn mine was leased to the Williams Brothers of Scorrier House; a very wealthy and experienced Cornish company. They maintained the lease from 1836 until 1900. Mine operations and outputs had peaked by the middle of the century and the mapping depicts the main workings at the Upper Boat Level at two dressing floors; one around the Upper Boat adit portal and another at

Maescarhyg Level. At Upper Boat, material was sorted into pure galena ore and required more processing than the worthless gangue, as evidence by the complex dressing floor shown on the mapping. Here, spoil tips (PRNs 99288, 99289 and 99290) frame the north and southern banks of the Nant y Bai west of the dressing floor where a small reservoir is also depicted. Several buildings are shown, some of which almost certainly originate from the 18<sup>th</sup> century such as the water-powered crushing mill (PRN 99297) depicted in the centre, likely to be that painted by Warwick Smith in 1792. A canal wharf (PRN 125872) is shown exiting the Upper Boat adit portal (PRN 99300) marked as "Level" opposite the Anghred farmstead (PRN 118179). Two buildings are shown to the south of the water-powered crushing mill; the most westerly of these buildings (PRN 99296) appears to be built into an embankment and a possible leat follows the contour of the bank westwards. A long, rectangular building (PRN 99298) to the northeast of the crushing mill is marked as a Smithy and a number of leats and aqueducts connect to various buildings of unknown function. Two buddles (PRN 99291) are shown on the northern bank of the Nant y Bai and would have been rotated by the small water wheel (PRN 99292) lower down the bank by the connecting flatrods.

- 6.4.4 Whilst the majority of ore was being transported and smelted off site at this time, it would be reasonable to assume that small scale smelting was also taking place on site. Indeed, Hughes (*ibid*) speculates that the smithy and associated buildings (PRNs 99296 and 99295) constitute smelting works, with the embankment to the south being a redundant furnace flue.
- 6.4.5 Moving upstream towards the Maescarhyg Level dressing floor, a rectangular enclosure (PRN 118180) is shown at the junction of connecting tracks between the two dressing floors. Opposite this enclosure is a small oval shaped reservoir (PRN 125685) into which drains a leat connected to the embankment building (PRN 99296) at the Upper Boat Level dressing floor. A little further upstream, a small foot bridge is shown from which a track leads to White Hall Isaf farmstead (PRN 21835).
- 6.4.6 At the Maescarhyg Level dressing floor a broad spoil tip (PRN 99305) encroaches down the southern bank of the Nant y Bai, east of which is a flat topped conical tip of tailings south of a water-powered crushing mill (PRN 99306). The portal to the Maescarhyg Level is marked as "Level" (PRN 99313). Two narrow reservoirs (PRNs 99309 & 99310) fed by a leat from the Nant y Bai and orientated north-south, are located to northeast of the crushing mill. A third large reservoir (PRN 125867) with direct ingress and egress to the Nant y Bai, is located to the north west of the crushing mill. Two narrow, rectangular buildings (PRN 125868) orientated north-south are shown to the east of this third reservoir to which it is connected by a small leat at its south western corner. Adjacent to this building are two small ponds, likely settlement ponds. This arrangement of features supports George Hall's hypothesis that there was a smelting works at Masecarhyg (*ibid*). Finally, White Hall Ucaf farmstead (PRN 13389) and its five enclosures is shown on the northern bank of the Nant y Bai, opposite the dressing floor.
- 6.4.7 Elsewhere, three disused levels are marked in the south-eastern extent of the study area, in the vicinity of the present day Angred Shaft, Engine House and New Shaft. Level Goch (PRN 99327) are also annotated as disused whilst Level Tan (PRN 99317) and its development tip (PRN 99316) are clearly shown at the northern extent of the study area.

# Ordnance Survey 2<sup>nd</sup> edition 25" published in 1905 (Figure 10)

- 6.4.8 By 1905 the mine lease had been relinquished as the Williams Brothers believed the mine to be unprofitable. Operations ceased and would not resume until 1914. The 2<sup>nd</sup> edition 25" map depicts the mine during this hiatus and does show the subtle progression during the final years of the William's lease.
- 6.4.9 At the Upper Boat Level dressing floor all of the buildings are now shown to be roofless and the crushing mill (PRN 99297) is much diminished. Four buddles (PRN 99291) are now shown but their waterwheel is not. Instead, a small square building (PRN 99294) is shown slightly south of the former. A new shaft (PRN 99293) is shown directly south of the buddles, directly adjacent to the Nant y Bai stream. The canal wharf (PRN 12572) of the Upper Boat Level has been truncated at its western end by a U- shaped pond. Indeed, the Upper Boat adit portal (PRN 99300) and air shafts (PRNs 99301 & 99303) are still marked but prefixed by the word "Old".
- 6.4.10 The Anghred farmstead (PRN 118179) is shown as abandoned and the small, oval shaped reservoir opposite enclosure (PRN 118180), has now been reduced to a single wall (PRN 125685).
- 6.4.11 At the Maescarhyg dressing floor, the buildings are also shown to be roofless, the western reservoir (PRN 1125867) is now shown to be a shallow tip and the Masecarhyg level has also been prefixed with "Old".
- 6.4.12 Elsewhere, the Angred Shaft (PRN 99339) sunk sometime after 1887, and its accompanying engine house (PRN 61156) are clearly depicted, along with its steep development tip (PRN 99338). The "Old Levels" previously shown, including Level Tan (PRN 99317) are reproduced.

# RAF 1946 Aerial Photograph (Figure 4)

- 6.4.13 The RAF 1946 vertical aerial photography provides a rare glimpse of the mine in the interval between its final abandonment over a decade previously, and the forestry planting of the 1970s. The resolution is quite poor but it shows the broad expanse of the reworked tips and the vague footprint of the 1929 crushing and flotation mills. There is little trace of the neat buildings shown in the 1930 photograph (Figure 5) but the Angred Engine House (PRN 61156) is visible. Perhaps most noticeable is the extent of workings, tips and depressions visible all the way along the western slopes of Pen Cerrig Mwyn, where at the north eastern end it is possible to identify a number of possible hushings and sunken pits (PRNs 125876, 125875, 125874, 125695, 99318), orientated northwest/southeast around Level Tan (PRN 99317).
- 6.4.14 The dressing floor at Maescarhyg Level is buried under tips but the narrow reservoirs (PRN 99309 & 99310) are extant. At the Upper Boat Level dressing floor it is possible to see, under magnification, the extant remains of at least six buildings, including the embankment buildings (PRNs 99295 & 99296), the supposed smithy building (PRN 99298) and the non-descript buildings PRNs 125683, 125871 and 99299. There is no trace of the canal (PRN 125872) or crushing mill (PRN 99297) and this area looks as though it has been flattened or landscaped for it is an obvious plateau in an area otherwise dominated by steep, narrow dumps.

# 25cm LiDAR Digital Terrain Model (Figures 11-17)

6.4.15 High resolution, 25cm LiDAR data of the Nantymwyn survey area captured in December 2020 by the Coal Authority, has provided an unprecedented record of the study area. The Digital Terrain Model (DTM) removes the tree canopy from the dataset and has provided an insight into the surface topography presently obscured by forestry. This data has been an invaluable resource during this

assessment, and it has significantly improved efforts to reconcile the historical narrative with the physical resource, and clarify the observations made during the site visit. The DTM overlaid with the 2<sup>nd</sup> edition Ordnance Survey 25" map and the recorded heritage assets is shown in Figure 11. A 3D rendered perspective model, showing the DTM study area and salient landscape features is shown in Figure 12. It should be noted that the DTM does seem to have some residual "holes" leftover from the removal of the tree canopy. These are a result of the data processing, a likely result of null values in the raster pixels which create artificial depressions which could be easily mistaken for shafts.

# 6.5 Site Walkover

- 6.5.1 A site walkover of the Nantymwyn study area was undertaken on 28<sup>th</sup> January 2021 to assess the nature and extent of any surviving archaeology on the ground and to allow for the possible identification of previously unrecorded sites.
- 6.5.2 All accessible parts of the study area were visited, with field notes and photographs georeferenced. A plan of photograph locations taken during the site walkover is presented in Figure 18 at the end of this report. A gazetteer of the existing 70 HER records was used to locate the known, recorded assets. Previously unrecorded features encountered during the visit were recorded and their precise locations captured using a handheld GPS with NGRs accurate to within 3m. The photographs included in this report are presented in Section 9. Sites in the following text are referred to by their PRNs; please refer to tables in Appendices 1 and 2.
- 6.5.3 The site walkover began at the scheduled Angred Shaft and Engine House (CM215; PRNs 99339 and 61556) at the south-eastern extent of the study area (Figure 13). The engine house is located at an elevated position on the contours of Pen Cerrig Mwyn and overlooks the vast expanse of the mine workings in this area. It is flanked by forestry to the southwest and north east (Photos 1 & 2). The masonry remains of the engine house is in generally poor condition. A roofless shell for some time, its considerably ruinous given its relative age and material construction although its gables survive almost to full height. A tree has taken hold of the wheel pit and there are significant structural cracks visible on the external elevations (Photo 3). Indeed, the southwest facing elevation appears to be leaning outwards, tearing quietly away from the rest of the building fabric. Little remains of the adjoining boiler house save some plinths of wall, and a pitch line is visible in the cement rendered, eastern gable (Photo 4). Here a void in the concrete floor exceeds 1m in depth. The chimney is in a similar condition and the red brick section at the top of the stack area looking quite perilous.
- 6.5.4 The impressive subsidence cone of the Angred Shaft (PRN 99339) is located below the north-western gable of the engine house. At the time of the walkover (following a period of heavy rain), the bottom of the cone was filled with water and refuse from past fly tipping (Photo 5). Two development tips (PRN 99338) of monumental proportion, loom in a north-west from the front of the shaft.
- 6.5.5 The narrow feeder tank for the boiler (PRN125678) is clearly visible south-west of the engine house, albeit at a slightly higher elevation than the former. It is well defined measuring approximately 15m long, 3m wide and at least 1m deep (Photo 6). There is also evidence of a small leat at its northern end.
- 6.5.6 The adit portals of the Upper and Lower portals of the Angred Adit (PRNs 125689 and 125690), located a short distance above the engine house within the forestry, were not visited.
- 6.5.7 North of the engine house are terraced tailings which are being extensively eroded by surface water, the main contributor being a modern culvert located just below the upper forestry track which runs along the eastern parameter of the

study area. Here it is clear to see that heavier material is being washed downslope where it settles at the base of the terraces, leaving scours of fine, friable material (Photos 7 & 8). Elsewhere along these tips, there are several deep rivets and pools of standing water. There was no evidence of the smaller mine buildings shown in the 1930's photograph (Figure 5).

- 6.5.8 The site walkover progressed northwards along the uppermost forestry track at the parameter of the study area which provided an almost panoramic view of these workings and onto the northern bank on the Nant y Bai (Photo 9). The tall concrete ore bin of the former 1929 mills (PRN 99335) is a stark feature in an otherwise undulating and terraces terrain. The forestry track also provided a safe vantage point of New Shaft (PRN 99333), north east of the ore bin. The adits identified by Hughes (*ibid*) (PRNs 99331 and 99340) and supposedly located along the periphery of the track, were not identified.
- 6.5.9 At the northern eastern corner of the study area, several features of note were identified (Figure 14). A gentle incline diverted from the forestry track, following the contours of the slope that lead to an area of recently felled forestry. After a little gentle troweling, a well laid stone pitched track with a prominent eastern kerb, was revealed (PRN 99325) (Photos 10 & 11). The HER record suggests that it was a dressing floor but it would appear more likely to be the remains of an inclined track leading to two circular shafts. The first shaft (PRN125679) survives as a small depression, c. 2m in diameter that has young trees growing from it (Photo 12). A little further northeast of this crater was an unmistakable subsidence cone, c. 5m diameter which was enclosed by a post and wire fence (Photo 13). This crater (PRN 99324) is recorded in the HER as "Reed's Shaft" but should read "Red Shaft" mentioned in literature. However, this must be attributed with some caution for the precise location of this shaft is not known only that again, according to Hughes (ibid), it was located north of Level Goch (PRN 99327). Although not visited during the site walkover, the possible crater for Level Goch was identified on the LiDAR DTM and is indeed located some 75m south.
- 6.5.10 The remaining workings in this area, namely the possible hushings (Figure 15 and Appendices) were not identified during the walkover for the terrain undulated quite steeply here, and the features were not visible from lower contours. In truth, the density and sensitivity of features in this area wasn't properly realised until examination of LiDAR data which was made available after the site walkover.
- 6.5.11 From here the walkover turned down slope in pursuit of Level Tan (PRN 99317) (Figure 14). West of the hairpin bend of the forestry track, the slope dropped steeply down onto (or *into* depending on the approach!) a linear earthwork (PRN 125688) with an irregular, but broadly asymmetrical profile (confirmed by the LiDAR), densely over grown with mature gorse bushes. It was orientated north south, passing above the small reservoir (PRN 99315), and appeared to have some stone reveting along its western edge (Photos 14 and 15). The northern end graduated into a shallow, water filled gully where the portal to Level Tan (PRN 99317) was located. The trapezoid shaped portal had clearly slumped and was heavily vegetated, through which a small animal burrow visible high up towards the roof, betrayed the void behind (Photo 16). A little light clearance of the southern side revealed dry stone walling. Directly opposite the portal was the development tip (PRN 99316) (Photo 17).
- 6.5.12 From Level Tan, the walkover headed south back to the terraced tips and concrete platforms of the 1920's mills and New Shaft (Figure 15). The shuttered concrete footprint of the mills (PRN 99335) is in stark contrast to the antiquity of Level Tan and yet it has proven to be a favourable location for various mosses and lichens (Photo 18). All of the plant was dismantled and shipped away after operations ceased and the remaining imprint creates a rather modest impression

of the extent of the structures that once milled thousands of tons of material (Photo 19; see also Figure 5). And yet to the enthusiastic industrialist there is no doubt that much is to be gained from these surprisingly nuanced remains, including the occasional artefact (Photo 20).

- 6.5.13 North of the mills was a concrete buttress on the western side of New Shaft (PRN 99333) which presumably formed the sheer for the shaft headframe (Photo 21). A large, steep sided spoil tip (PRN 99334) was adjacent. Directly in front of the mills are the terraced slime pits (PRN 99307) remaining from the flotation processing (Photo 22).
- 6.5.14 From here, the walkover headed northwards again, crossing the forestry road and onto the Maescarhyg dressing floor (Figure 16). This area is now an expanse of dumps, masking tailings and there was no trace of the crushing mill (PRN 99306), smelting works (PRN 125868) or indeed the Maescarhyg Level (PRN 99313) (Photo 23). Only the southern most reservoir (PRN 99309) remained (Photo 24).
- 6.5.15 The walkover then progressed to the Upper Boat Level dressing floors (Figure 17) and approached from the west along a metaled track from the forestry road. At Upper Boat Level, the Nant y Bai meanders through a narrow valley of extensive dumps, some of which are presumed to be derived from 20<sup>th</sup> century milling operations (Photo 25).
- 6.5.16 Upon arrival at the former dressing floor the density of features became apparent (Figure 21). The area was characterised by varying levels of spoil heaps and tailings, from which numerous structural remains were visibly eroding. The fluvial erosion of the tips on the northern bank of the Nant y Bai has created a near vertical profile, revealing earlier structures and features. The most exciting of these were what appeared to be the remains of wooden launders (PRN 125680) protruding out from a short plateau, a short distance southeast of the supposed location of the buddles (PRN 99291) shown on historic mapping (Photo 26). A tall ridge of spoil has buried their location.
- 6.5.17 Upstream from here, the remains of a substantial, linear stone platform with protruding timbers (PRN 125681) were found (Photos 27 & 28). This does not easily correlate to any features shown on historic mapping and nor is it well defined on LiDAR data. There was no trace of waterwheel (PRN 99292) depicted on historic mapping.
- 6.5.18 Clearly visible as an extant structure with walls surviving in excess of 1.0m high, was the remains of the small, square building (PRN 99294 and likely duplicate PRN 125682) shown on historic mapping and identifiable on the 1946 vertical photography (Photo 29). Directly north of this and imposing over the Nant y Bai was another linear stone platform, with protruding horizontal timbers (PRN 125686; Photo 30). A little further upstream a revetted wall along the southern edge of the Nant y Bai was obviously visible (PRN 125683) (Photo 31).
- 6.5.19 Elsewhere there were no traces of the crushing mill (PRN 99297) nor of the smaller, adjacent rectangular building (PRN 125869) shown on historic mapping. Prominent, however, were a pair of buildings built against the embankment running along the southern extent of the dressing floor (Photo 32). The western building (PRN 99296) is quite substantial, is likely over 3.0m in height and appears to be built into the embankment. Conversely, the eastern building (PRN 99295) is a low ruin.
- 6.5.20 Heading back along the course of the Nant y Bai another group of ruined walls was recorded. A length of low walling, orientated roughly northeast-southwest, corresponds to the smithy building (PRN 99298) shown on the historic mapping and visible on the 1946 photography (Photo 33). Also extant as a ruined structure is building (PRN 99299), its eastern elevation surviving to around 1.5m in height (Photo 34). Beyond this there is no visible trace of the canal wharf (PRN 125872)

that once served the Upper Boat Level although the ground is rush filled and very wet.

- 6.5.21 The portal for Upper Boat Level (PRN 99300) has collapsed and no formal structure survives. However, an ochreous stream discharges from a heavily vegetated crevice (Photo 35). The airshaft crown hole (PRN 99301) located a short distance up slop was not visited.
- 6.5.22 The final explorations upstream in this area revealed the remains of a low wall at the toe of a spoil heap (PRN 99302) (Photo 36) and a second (PRN 125685), in the location of the small reservoir shown in the first edition Ordnance Survey map, replaced by a single wall on the 2<sup>nd</sup> edition (Photo 37). The survey did not progress beyond this point.

# 6.6 **Previous Archaeological Work**

- 6.6.1 Nantymwyn lead mine was briefly assessed in 1993 by Jennifer Protheroe Jones, Curator of Heavy Industries at the National Museum of Wales, on behalf of Dyfed Archaeological Trust (Protheroe Jones, 1993). The results of this survey constitute the baseline for the heritage assets now recorded on the HER and included in this assessment.
- 6.6.2 No recorded intrusive archaeological investigations or detailed archaeological surveys have been undertaken within the study area.

#### 7. ASSESSMENT OF ARCHAEOLOGICAL POTENTIAL

#### 7.1 Calculating Areas of Archaeological Potential (Figure 19)

- 7.1.1 Following the results of the desk-based assessment and the completion of the walkover survey, it has been possible to draw a map of the study area showing zones of probable archaeological potential. The map presented in Figure 19 identifies areas of low, medium or high archaeological potential with areas coloured red, amber and green respectively.
- 7.1.2 In broad terms, one could consider the entirety of the Nantymwyn study area as an area of high archaeological potential and sensitivity. This however, is not pragmatic and is unhelpful in quantifying and identifying the archaeological constraints ahead of any remediation scheme.
- 7.1.3 All assets identified during this assessment were amalgamated into one dataset and assigned a value based on their evidence; 2 for extant features and 1 for those evidenced by documentary sources only or not visible during the site walkover. Using GIS software, a subsequent vector point layer was created and subjected to a statistical interpolation process known as Weighted Kernel Density Estimation to produce a heatmap visualization of the density of sites and their ranked values to determine archaeological potential and sensitivity.
- 7.1.4 Each point was allocated an influence radius of 100m. The resultant heatmap is a raster layer in which each pixel within that dataset contains the interpolated weighted sum of the ranked values of all the sites. Pixels with the highest values indicated the greatest potential and therefore the sensitivity whilst pixels with the lowest values indicated the lowest risk. It was then possible to reclassify the range of highest to lowest pixel values into 3 categories; High, Medium and Low. It is important to note that these areas are intended to be used as guidance to enable a pragmatic and informed approach to the remediation scheme. Their parameters are not to be taken literally; rather they ought to indicate appropriate levels of mitigation and due caution.
- 7.1.5 The risk criteria are as follows:

- **High areas** are those where there is the greatest density of known archaeological features.
- **Medium areas** are those where there is a lower density of known archaeological features and/or a large number of features evidenced by documentary sources.
- **Low areas** comprises areas where there is a sparsity of recorded archaeological features within the proximity of the mine workings but is considerate of the potential for undocumented workings to exist within the area.

# 7.2 Areas of High Archaeological Potential (Areas 1, 2, 3, 4, 5, 10 & 11)

- 7.2.1 These areas include the numerous extant remains of the dressing floor at Upper Boat Level, the scheduled area of the Angred Shaft and Engine House, the Angred adits and the concrete footprints of the 1920 mills and New Shaft. Areas 4 and 5 in the north eastern extent of the study area encompass the earthworks associated with Level Tan, including the later reservoir and linear earthwork of unknown date, as well as the recorded shafts and possible hushing gullies in this area. Area 3 simply covers the only known, extant remains of the Maescarhyg Level dressing floor, namely the narrow reservoirs. Areas 10 and 11 comprise the visible remains of the White Hall Isaf and White Hall Uchaf farmsteads, including the lazy beds of the latter.
- 7.2.2 These areas of surviving archaeology, irrespective of age, equate to the most archaeologically sensitive components of the study area.

#### 7.3 Areas of Medium Archaeological Potential (Areas, 6, 7 & 8)

- 7.3.1 Area 6 includes the remaining spoil tips and sparsely dispersed area of lesser, extant remains at Upper Boat Level dressing floor. Given the antiquity and longevity of operations in this area of the mine, it is entirely possible that much earlier undocumented features may be buried within the tips in this area. Indeed, the structures eroding along the northern bank of the Nant y Bai are testament to this. Whilst there was no trace of the crushing mill here, the topography suggests that this particular area has been raised, and it would be reasonable to assume that buried foundations and an infilled wheelpit and leats survive below ground.
- 7.3.2 Area 7 is a much more amorphous and expansive area and covers largely the resampled and disturbed tailings from the 1930 milling operations. It covers the former dressing floor at Maescarhyg Level which according to the 1930s photograph also housed a number of modern mine buildings. Footway Level, driven from 1916, is supposed to be located at the junction between the Maescarhyg Level, New Shaft and southwest of the small reservoir south of Level Tan. As well as the possibility of buried structural remains surviving in these areas, there may be potential for information to be gleaned from specialist assessment and chemical analysis of the remaining tailings that could reveal information about evolving operations in this area. This includes also the extant slime pits east of the 20<sup>th</sup> century mill.
- 7.3.3 Area 7 also covers the confusion of tips and workings on the slopes above New Shaft where several locations for old adits are suggested by documentary sources. The distinctive circular area south east of the Angred Engine House covers a number of tentative points recorded around the extant Top Level Roderick's Adit. Similarly, Area 8 around Level Tan covers a number of possible workings in this area which are thought to be possibly the earliest dated elements of the mine.

# 7.4 Areas of Low Archaeological Potential (Area 9)

7.4.1 Area 9 contains a small number of recorded archaeological assets within the study area and is representative of the residual risk that undocumented workings associated with the mining operations survive in the area. It is a result of a lack of data in the spatial extent but in line with the old adage "absence of evidence is not evidence of absence" it would be reasonable to interpret this risk as low but not negligible.

# 8. CONCLUSIONS AND MITIGATION PROPOSALS

# 8.1 Archaeological Constraints

- 8.1.1 This assessment has produced a baseline dataset quantifying the archaeological potential and sensitivity of the resource at the Upper Boat Level area of Nantymwyn lead mine. The densest areas of archaeological potential and sensitivity are that of the former dressing floor at the Upper Boat Level portal where a number of features almost certainly originating from at least the 18<sup>th</sup> century survive, and the nationally important scheduled area of the 19<sup>th</sup> century Angred Shaft and Engine House and its surrounding later mine workings. Within the study area, Level Tan is considered to represent the earliest mine workings although the possible hushing gullies within its vicinity may well have much earlier origins.
- 8.1.2 Whilst the area is now dominated by reworked tailings, the former dressing floor at the Maescarhyg Level and its surviving reservoir predates the Upper Boat Level dressing floor and may preserve the earliest evidence for smelting on the site.
- 8.1.3 The full, invasive impact of later mining operations, especially the milling in the 20<sup>th</sup> century is not properly understood and the potential for surviving earlier mine workings in this area may have been unfairly dismissed, as there is clear evidence across the study area that buried structures survive below the spoil tips and dumps of waste material. As part of a Natural Resources Wales remediation project at Frongoch lead mine in Ceredigion in 2014/2015 archaeological investigation recorded deeply stratified and well preserved mining features preserved within and under deposits of tailings that were not visible above ground (Murphy et al 2015).
- 8.1.4 Consideration should be given to the problem of surface water eroding the tips above the modern crushing mill and to a lesser degree, the surface water and run off impacting archaeological assets at lower levels of the study area, including the slime pits.

# 8.2 Archaeological Mitigation

- 8.2.1 Due to the archaeological sensitivity of Nantymwyn lead mine, with its remarkably long history; it is clear that any future remediation scheme will require archaeological mitigation, as the surviving archaeological remains are of national significance.
- 8.2.2 It is hoped that this assessment will help inform the design of any remediation scheme, as well as decisions on archaeological mitigation. The mapping of archaeological potential is intended to provide a baseline understanding of the resource and identify opportunities where further work may be required.
- 8.2.3 It is understood that surface runoff from the tips and reservoirs and lagoons into the Nant y Bai stream, is the main source of contaminants which needs to be

remediated. Invasive solutions such as reprofiling of tailings or the diversion of water runoff could adversely impact the archaeological resource. It is suggested that any such scheme is preceded by consultation with industrial specialists particularly Jennifer Protheroe-Jones, Curator of Heavy Industry at the National Museum of Wales and members of the Welsh Mines Society. The newly captured 25cm LiDAR data for the mine area is an invaluable resource and merits proper study.

8.2.4 Ultimately, decisions on the requirement and scope of any future programme of archaeological mitigation lies with the archaeological advisor to the Local Planning Authority (Dyfed Archaeological Trust-Development Management).

# 9. SOURCES

# Cartographic

1868 – Llanfair ar y bryn parish Tithe Award map of 1868

- 1876 Plan and Section of Nantymwyn Mine. Coal Authority. Ref: OM4077
- 1888 First Edition Ordnance Survey 25-inch map of Carmarthenshire
- 1905 Ordnance Survey 25-inch map of Carmarthenshire
- 1932 Nantymwyn Mine Plan and Longitudinal Section. Coal Authority. Ref: OM10856

# Lidar

25cm LiDAR captured in December 2020: the Coal Authority

# Photographic

RAF Operation Revue 1946 Vertical photographs: Sortie No. 106GUK/1471 14.05.46

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Murphy, K and Ludlow, N. 2000. *Carmarthenshire Historic Landscape Characterisation, Volume 1; Black Mountain and Mynydd Myddfai, Tywi Valley, Dolacothi, Taf and Tywi Estuary*. Dyfed Archaeological Trust.

Natural Resources Wales.2014a. Abandoned Mine Case Study: Nantymwyn Lead Mine

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Timberlake, S. 2002. An archaeological examination of some early mining leats and hushing remains in upland Wales. Archaeology in Wales, Vol. 43

# Unpublished

Atkins. 2011. Nantymwyn Metal Mine Scoping Report

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Murphy, F. Wilson, H & Protheroe-Jones, R, 2015. *Frongoch Metal Mine, Ceredigion Archaeological Fieldwork 2014-2015,* DAT Unpublished Report No 2015/30

Prothereo-Jones. J. 1993. Metal Mines survey archive held Dyfed Archaeological Trust HER

# Database

Dyfed Archaeological Trust Historic Environment Record, housed with Dyfed Archaeological Trust in The Corner House, 6 Carmarthen Street, Llandeilo, Carmarthenshire, SA19 6AE

#### Websites

AditNow: Mine exploration and mining history website and forum:

<u>Mine exploration, exploring disused mines and quarries, mining history, photographs and information for explorers, historians and industrial archaeologists (aditnow.co.uk)</u>

Coflein: The Royal Commission on the Ancient and Historic Monuments of Wales: <u>https://coflein.gov.uk/en/site/search</u>

#### 10. FIGURES



Figure 1: Extract of the 1:50,000 Ordnance Survey map showing the location of Nantymwyn lead mine (outlined in pink).

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Figure 2: The Nantymwyn study area (outlined in pink).

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**Figure 3:** 25cm LiDAR overlaid on satellite imaging showing the main features and phases at Upper Boat Level within the study area (outlined in pink) (25cm LiDAR ©Coal Authority 2020)

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Figure 4: Extract of the 1946 RAF vertical aerial photograph covering the Nantymwyn study area outlined in pink and possible hushing gulleys outlined in yellow.



Figure 5: 1930 photograph of the operations around New Shaft and the floatation and crushing mills (after Brabham and Umar, 2011).



Figure 6: Map showing designated sites, Scheduled Monuments (outlined in red) and Listed Buildings (blue triangles) within the Nantymwyn study area (outlined in pink) and 100m search buffer.

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Figure 7: Non-designated assets recorded on the HER (red stars) within the Nantymwyn study area (outlined in pink) and 100m search buffer.

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Figure 8: Extract of the 1868 Llanfair ar y Bryn parish tithe map with the Nantymwyn study area outlined in pink



**Figure 9:** Extract of the 1<sup>st</sup> edition Ordnance Survey 1:2500 map published in 1888, with the study area outlined in pink.



**Figure 10:** Extract of the 2<sup>nd</sup> edition Ordnance Survey 1:2500 map published in 1905, with the study area outlined in pink.



Figure 11: 25cm LiDAR DTM (Digital Terrain Model) overlaid with the 1905 2<sup>nd</sup> edition 1:2500 Ordnance Survey map showing the non-designated assets recorded on the HER (red stars) within the Nantymwyn study area (outlined in black) and 100m search buffer. (25cm LiDAR ©Coal Authority 2020)



Figure 12: 3D rendered 25cm LiDAR of the Nantymwyn study area (25cm LiDAR © Coal Authority)



**Figure 13:** 1905 2<sup>nd</sup> edition 1:2500 OS map overlying the 25cm LiDAR data showing the recorded archaeological assets (red stars) around the scheduled areas (red polygons) of the Angred Shaft and Engine House. (25cm LiDAR ©Coal Authority 2020)

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**Figure 14:** 1905 2<sup>nd</sup> edition 1:2500 OS map overlying the 25cm LiDAR data showing the recorded archaeological assets (red stars) around Level Tan and possible hushing gulleys at the northern end of the study area. (25cm LiDAR ©Coal Authority 2020)

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**Figure 15:** 1905 2<sup>nd</sup> edition 1:2500 OS map overlying the 25cm LiDAR data showing the recorded archaeological assets (red stars) around the 1929 Crushing Mill and New Shaft. (25cm LiDAR ©Coal Authority 2020)



**Figure 16**: 1905 2<sup>nd</sup> edition 1:2500 OS map overlying the 25cm LiDAR data showing the recorded archaeological assets (red stars) around two reservoirs. (25cm LiDAR ©Coal Authority 2020)



**Figure 17**: 1905 2<sup>nd</sup> edition 1:2500 OS map overlying the 25cm LiDAR data showing the recorded archaeological assets (red stars) at the Upper Boat Level portal and dressing floors. (25cm LiDAR ©Coal Authority 2020)



Figure 18: Map showing the location of photographs taken during the site walkover.

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Figure 19: Areas of archaeological potential within the Nantymwyn study area. The 25cm LiDAR DTM data is overlaid with the 1905, 2<sup>nd</sup> edition 1:2500 Ordnance Survey map. (25cm LiDAR ©Coal Authority 2020)

Nantymwyn Lead Mine

# **11. PHOTOGRAPHS**



Photo 1: Overview of Scheduled Area CM215 (including Engine House, Angred Shaft, Chimney and development tip). DAT photo#2559



Photo 2: Overview of scheduled monument CM215 - Angred Engine House & Chimney. DAT Photo#2540



**Photo 3**: The tree growing from the wheel pit of the Angred Engine House. DAT Photo #2545



Photo 4: The southern gable of the Angred Engine house showing roof pitch line. 1m scale. DAT Photo#2548



Photo 5: Subsidence cone of the Angred Shaft (PRN 99339). DAT Photo#2543



Photo 6: Overview of the boiler feeder reservoir to the Angred Engine House (PRN125678). DAT Photo#2553



**Photo 7:** The modern culvert and eroded tips above the Angred Engine House. DAT Photo#2549



**Photo 8:** Overview of the eroding tips above and to the northeast of the Angred Engine House. DAT Photo#2550



Photo 9: Overview of the mine workings at the eastern extent of the study area. The ore bin (PRN 99335) of the modern crushing mill is visible in the foreground whilst the enclosures of White Hall Uchaf are visible on the northern slopes of the Nant y Bai. DAT Photo#2556



**Photo 10:** The pitched stone surface of the inclined track (PRN 99325). 1m scale. DAT Photo#2567



Photo 11: The lightly trowelled surface of the metalled track (PRN 99325) revealing it's eastern kerb. 1m scale. DAT Photo#2569



Photo 12: A small circular shaft (PRN125679). DAT Photo#2568



Photo 13: Subsidence cone (PRN 99324) of the possibly erroneously named "Reed's" shaft. DAT Photo#2564



Photo 14: Overview of the small reservoir (PRN 99315), south of Level Tan with the linear earthwork visible in centre of the image. DAT Photo#2570



Photo 15: General view of the linear earthwork (PRN 125688) south of Level Tan and densely covered by gorse. DAT Photo#2575



Photo 16: The slumped portal of Level Tan (PRN 99317). 1m scale. DAT Photo#2572



Photo 17: The start of the development tip (PRN 99316) of Level Tan. DAT Photo#2573



**Photo 18:** Overview of the ore bin and footprint of the 20<sup>th</sup> crushing mill (PRN 99335). DAT Photo#2576



**Photo 19:** The shuttered concrete platform of the 20<sup>th</sup> century crushing mill (PRN 99335). DAT Photo#2588



**Photo 20:** The remaining staves of a wooden bucket at the base of the 20<sup>th</sup> crushing mill (PRN 99335). 1m scale. DAT Photo#2581



Photo 21: Concrete buttress for the former steer of the headframe of New Shaft. DAT Photo#2587



**Photo 22:** The terraced slime pits (PRN 99307) at the northwest of the 20<sup>th</sup> mills. DAT Photo#2583



Photo 23: Resampled tailings at the southern end of the Maescarhyg Level (PRN 99313) former dressing floor. DAT Photo#2585



**Photo 24:** The reservoirs east of the former dressing floor of the Maescarhyg level (PRN 99313). DAT Photo#2586



**Photo 25:** Overview of the dumps at the western end of the Upper Boat Level dressing floor. The Nant y Bai runs down the centre of the area. DAT Photo#2591



**Photo 26:** Wooden launders (PRN 125680) eroding below the tailings on the northern bank of the Nant y Bai and the Upper Boat Level Dressing floor. DAT Photo#2592



Photo 27: The western end of a linear stone platform (PRN 125681), with protruding timbers at the Upper Boat Level dressing floor. 1m scale. DAT Photo #2593



**Photo 28:** A section of dry stone walling on the northern side of the stone linear platform (PRN 125681) at the Upper Boat Level dressing floor. 1m scale. DAT Photo 2594



**Photo 29:** The remains of the small, square building (PRN 99294) shown north of the historic crushing mill, and visible on the 1946 aerial photograph. 1m scale. DAT Photo #2595



**Photo 30:** The linear stone platform (PRN 125686), with eroding horizontal planks at the Upper Boat Level dressing floor. 1m scale. DAT Photo #2610



Photo 31: Revetted stone walling (PRN 125683) on the southern side of the Nant y Bai on the dressing floor at Upper Boat Level. DAT Photo 2596



**Photo 32:** The remains of a pair of buildings (PRNs 99295 and 99296) and embankment shown on historic mapping south of the crushing mill on the Upper Boat Level dressing floor. DAT Photo # 2606



Photo 33: The remains of the smithy building (PRN 99298) marked on historic mapping and visible on 1946 aerial photography. 1m scale. DAT photo #2598



Photo 34: The remains of a small, rectangular building (PRN 99299), at the eastern end of the former Upper Boat Level dressing floor. DAT Photo #2599



Photo 35: The collapsed and heavily vegetated portal of the Upper Boat Level (PRN 99300). DAT Photo #2604



Photo 36: The remains of a low wall (PRN 99302) at the eastern end of the Upper Boat Level dressing floor. 1m scale. DAT Photo #2601


Photo 37: The remains of a low wall (PRN 125685) shown on the 2<sup>nd</sup> edition Ordnance Survey map at the very eastern end of the Upper Boat Level dressing floor. DAT Photo #2605

## **12. PROJECT ARCHIVE**

Project Number: FS20\_065 Project Name: Nantymwyn Lead mine DBA Update Event Record Number: 125658 Digital Photographs: x 59 JPEGs Digital Photographs Film Number: 125658\_2540 to 125592\_2612 Photographic Record x 1 Excel Workbook GIS MapInfo Tables and ESRI Shape files

## APPENDIX I

**Table 4:** Non-designated HER assets within the Nantymwyn study area.

PRN	NPRN	ТҮРЕ	PERIOD	DESCRIPTION	NGR
8880	33915	Lead Mine	POST MEDIEVAL	Nantymwyn was one of the largest metal mining complexes in southwest Wales. Its origins may be ancient, but its peak years of production came in the 19th century and it continued to work in to the 20th century. Some of the site is now a Scheduled Monument.	SN7870044600
13389	245100	Farmstead	POST MEDIEVAL	A deserted farmstead complex lying on south facing slopes above the Nant Y Bai valley and facing the Nantymwyn lead mine remains located on the opposite side of the river.	SN78554485
13391	245102	Cultivation Ridges;Lazy Beds:Pillow Mound	POST MEDIEVAL	A group of 5 parallel narrow linear mounds lying on a southeast facing slope overlooking the Nant Y Bai valley. They lie just to the northeast of the deserted farmstead PRN 13389. F Murphy 2013	SN78624492
13394		Shaft	POST MEDIEVAL	A series of 4 old metal mine shafts. RPS Nov.2002 No mine shaft features could be identified on the ground during the uplands survey. (HGW 2008).	SN7866044835
17443		Lead Mine	POST MEDIEVAL	Major metal mining complex with possibly ancient origins, which continued in use into the 20th century. RPS Nov.2002 This record is a duplicate of 8880 - K Murphy 2010.	SN7857144661
21835	245109	Cottage	POST MEDIEVAL	19th century cottage. Shown on 1906 6" OS map. Now ruined. RPS 10.2001	SN78434475
61156	33676	Engine House	POST MEDIEVAL	Well preserved stuccoed masonry engine house with red brick quoins, masonry boiler house, and masonry chimney with red brick upper section. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010 - see sketch map.	SN7874744464
99287		Lead Mine	POST MEDIEVAL	An extensive valley bottom lead mine known as Nantymwyn Upper Boat Level. Active mainly in the 19th and early 20th century. For details of individual sites see PRNs 99288-99308. K Murphy based on R Protheroe Jones 2010.	SN78204466
99288		Spoil Heap	POST MEDIEVAL	This spoil tip shown on the early OS 1:2500 maps has been removed. See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.	SN7801444682
99289		Spoil Heap	POST MEDIEVAL	The western end of the tips shown on early OS 1:2500 maps on the north side of the river have been removed, and parts of the tips alongside the river have been eroded. See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones	SN7807744723
99290		Spoil Heap	POST MEDIEVAL	Long spoil tip shown on early OS 1:2500 maps survives. See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010	SN7813044720
99291		Buddle	POST MEDIEVAL	Four circular buddles in a row are shown on the OS 1:2500 2nd ed map. There is now no traces of them save for wooden launders eroding out of the tip at the SE of the site of the buddles. See PRNs 99287 and 8880 for further references. K Murphy based on	SN7818644688
99292		Water Wheel	POST MEDIEVAL	A waterwheel is shown on the OS 1:2500 1st ed map with rods leading from it to buddles 99291. There is now a eroded gully on the site, with no trace of the wheel or rods. See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jo	SN7821944675
99293		Mine Shaft	POST MEDIEVAL	A shaft is marked on the OS 1:2500 2nd ed map. There is now no trace of the shaft. See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.	SN7818544671
99294		Mine Structure	POST MEDIEVAL	A small rectangular structure/building is marked on the OS 1:2500 2nd ed map. A pile of rubble now marks the site. See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.	SN7822344669
99295		Mine Building	POST MEDIEVAL	A rectangular roofless building is marked on the OS 1:2500 2nd ed map. It is now a fragmentary ruin. See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.	SN7827444612
99296		Mine Structure	POST MEDIEVAL	Marked on the OS 1:2500 OS 2nd ed as a small rectangular building or structure, only a retaining wall to the rear now survives. See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.	SN7824344619
99297		Crushing Mill	POST MEDIEVAL	This crusher mill shown of early OS 1:2500 maps has been completely removed. See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.	SN7823544647
99298		Mine Building	POST MEDIEVAL	A long rectangular building is shown on early OS 1:2500 maps, with a smaller building to the west. Now reduced to fragmentary ruins. See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.	SN7828744648
99299		Mine Building	POST MEDIEVAL	Small rectangular building marked on early OS 1:2500 maps, now a ruin standing up to 4' high on its east side. See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.	SN7831844616
99300		Level	POST MEDIEVAL	Upper Boat Level. Rock-cut, water-filled, at head of long gully into which the sides have slumped. See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.	SN7838844612
99301		Air Shaft	POST MEDIEVAL	Air shaft into Upper Boat Level; open, cratered, in forestry.	SN7840044608

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			See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.		
00202	Spoil Heap	See PRNs         99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.           poil Heap         POST MEDIEVAL         Early OS 1:2500 maps show extensive spoil tips in this location. These have now been removed and the area is mar See PRNs           yir Shaft         POST MEDIEVAL         Damp area in forestry is the site of an air shaft. See PRNs         Murphy based on R Protheroe Jones 2010.           poil Heap         POST MEDIEVAL         An extensive area of spoil tips marked on early OS 1:2500 maps, now removed. See PRNs         See PRNs           poil Heap         POST MEDIEVAL         An extensive area of spoil tips marked on early OS 1:2500 maps, now removed. See PRNs         See PRNs           rushing Mill         POST MEDIEVAL         All trace of this crushing mill has been erased. See PRNs         See PRNs           lime Pit         POST MEDIEVAL         Low banks in marshy area may be remains of slime pits from 1920s mill. See PRNs         See PRNs           Aline Workings         POST MEDIEVAL         Poss Be mon Stage and ade 1:2500 maps. It still contains water. See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.           Iterevoir         POST MEDIEVAL         See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.           line Workings         POST MEDIEVAL         Reservoir show on OS 11:2500 tand and ed 1:2500 maps. It still contains water. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones	Early OS 1:2500 maps show extensive spoil tips in this location. These have now been removed and the area is marshy ground.	SNI78274462	
99302	Зроп пеар	POSTIVIEDIEVAL	See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.	31178374403	
00303	Image: special	Air Shaft		Damp area in forestry is the site of an air shaft.	SNI78/7///50/
55505		1 OST MEDIEVAL	See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.	5117647444554	
99305	Spoil Heap		An extensive area of spoil tips marked on early OS 1:2500 maps, now removed.	SNI78574478	
55505	эроптеар	1 OST MEDIEVAL	See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.	51176574478	
99306	Crushing Mill		All trace of this crushing mill has been erased.	SN786444775	
55500	Spoil HeapAir ShaftSpoil HeapCrushing MillCrushing MillSlime PitMine WorkingsReservoirReservoirSpoil HeapMine BuildingLevelMine BuildingLevelMine BuildingLevelMine BuildingLevelMine BuildingLevelMine BuildingLevelMine BuildingLevelMine WorkingsMine WorkingsMine Shaft;Spoil HeapLevelMine WorkingMine WorkingsMine Shaft;Spoil HeapLevelMine WorkingMine WorkingMine ShaftDressing Floor		See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.	5117804444775	
00207	Slime Dit		Low banks in marshy area may be remains of slime pits from 1920s mill.	SNI7862544654	
99307	Sinne Fit	FOSTIVILDILVAL	See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.	3117802344034	
00208	Mino Workings		Possible mine workings identified from aerial photographs (Hughes 1992, sketch map p90) in forestry, not examined in 2010.	SNIZOCAAE	
99506	Wille WORKINgs	POSTIVIEDIEVAL	See PRNs 99287 and 8880 for further references. K Murphy based on R Protheroe Jones 2010.	311780443	
00200	Bacanyoir		Small reservoir maked on OS 1st and 2nd ed 1:2500 maps. It still contains water.		
33303	Reservoir	PUST WEDIEVAL	See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	311/606544//0	
00210	Bacanyoir		Reservoir shown on OS 1:2500 1st and 2nd ed maps. The reservoir is now dry but its outline is visible.	5117960944946	
99510	Reservoir	POSTIVIEDIEVAL	See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	311/009044040	
00211	Speil Heen		Very extensive spoil tips are shown on early OS 1:2500 maps. These have been almost entirely removed.	SNI700446	
99311	Spoil неар	POSTIVIEDIEVAL	See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SIN788440	
00212	Mine Duilding	Madava	Concrete footings of 1920s building: office or house?		
99312	Wine Building	Iviodern	See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN/8/4444/38	
00242			No trace survives of the Maescarhyg Level.	CN/20/07/1/2/0	
99313	Level	POST MEDIEVAL	See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN/869/44/13	
00214		No. Jacob	Partial survival of concrete building of 1920s; office or house?	CN/2020444240	
99314	Mine Building	Modern	See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN/8/9144/10	
00245			Small reservoir partly in water.	CN17004544026	
99315	Reservoir	POST MEDIEVAL	See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN/881544836	
99316	Spoil Heap	POST MEDIEVAL	Development rock tip, partly vegetated.	SN7883644903	
			Level Tan. Run-in at head of partly dry-stone wall revetted shallow gully.		
99317	Level	POST MEDIEVAL	See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN/88/84489/	
		POST MEDIEVAL	Possible 'workings identified by aerial photography' (Hughes 1992, sketch map p90) in forestry. This PRN has been assigned to a series of possible		
99318	Mine Workings		workings along the eastern side of the main Pen Cerrrig Mwyn complex, all now in forestry. Not examined in	SN790449	
		POST MEDIEVAL	Possible 'workings identified by aerial photography' (Hughes 1992, sketch map p90) in forestry. This PRN has been assigned to a series of possible		
99320	Mine Workings		workings along the eastern side of the main Pen Cerrrig Mwyn complex, all now in forestry. Not examined in	SN791449	
			Partly vegetated spoil tip: appears to conincide with the site of Concience Shaft (Hughes 1992, sketch map, p90).		
99321	Reservoir         Spoil Heap         Mine Building         Level         Mine Building         Reservoir         Spoil Heap         Level         Mine Workings         Mine Shaft;Spoil Heap         Level         Mine Workings         Mine Shaft;Spoil Heap         Level         Mine Shaft;Spoil Heap         Level         Mine Shaft	POST MEDIEVAL	See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7898044860	
			Gully: run-in level?		
99322	Level	POST MEDIEVAL	See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7900844858	
			Crater/gully coincides with possible 'workings identified by aerial photography' (Hughes 1992, sketch map p 90).		
99323	Mine Working	POST MEDIEVAL	See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7896144829	
			Crater: site of Red Shaft (Hughes 1992, sketch map p.90). See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones		
99324	Mine Shaft	POST MEDIEVAL	2010.	SN7897944821	
	Dressing Floor		Area of well-made stone pitching with kerb to east: west margin has been destroyed: probably site of hand-dressing flooor.		
99325		POST MEDIEVAL	See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7895444802	
	Mine Workings	POST MEDIEVAL	Areas of possible 'workings indentified by aerial photography' (Hughes 1992, sketch map p. 90). Not examined in 2010		
99326			See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN790447	
99327	Level	POST MEDIEVAL	Level Goch: run-in: at head of large partly vegetated tip. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010	SN7896944717	
			Two benches with subsidiary tips to the Level Goch tip (99327): conicide with two possible 'workings indentified by aerial photography' (Hughes 1992		
			sketch map p.90).		
99328	Mine Tip	POST MEDIEVAL		SN7894244691	
			See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones		
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99329	Level	POST MEDIEVAL	No trace of Footway Level. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7885544742
99330	Mine Shaft	POST MEDIEVAL	No trace of Shaft Newydd (Hughes 1992, sketch map p.90). See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7890144731
99331	Mine Shaft	POST MEDIEVAL	Crater coincides with site of Circle Shaft (Hughes 1992, sketch map p.90). See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7888844611
99332	Level	POST MEDIEVAL	No trace of level marked on OS 1:2500 2nd ed map. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7881344607
99333	Mine Shaft	POST MEDIEVAL	Collapsed New Shaft; remains of retaining woodwork survive on west side. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7879544638
99334	Spoil Heap	POST MEDIEVAL	Area of fine tips. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN78744463
99335	Crushing Mill	Modern	Concrete base of 1920s crushing mill, with reinforced concrete ore bins at NE side. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7873144588
99336	Mine Structure	POST MEDIEVAL	No trace of a small rectangular structure marked on the OS 1:2500 2nd ed map survivies. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7868344623
99337	Level	POST MEDIEVAL	No trace of the Angred North Level (Hughes 1992, sketch map p.90). See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7868244550
99338	Spoil Heap	POST MEDIEVAL	Development rock tip from Angred Shaft (99339). See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7869044506
99339	Mine Shaft	POST MEDIEVAL	Angred Shaft: run-in crater 40' diameter x 30' dep, partly filled with refuse. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7873944477
99340	Adit	POST MEDIEVAL	Gully coincides with the site of an adit marked by Hughes 1992, p.90. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7886244582
99341	Adit	POST MEDIEVAL	Gully coincides with an adit marked as 'Old Level' marked on OS 1:2500 2nd ed map. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7883344548
99342	Spoil Heap	POST MEDIEVAL	Bench and tip coincides with possible ' workings identified by aerial photography' (Hughes 1992, sketch map p.90) in forestry, not examined in 2020. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7889444535
99343	Spoil Heap	POST MEDIEVAL	Crater and tip. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7883544459
99344	Adit	POST MEDIEVAL	Eroded gully and partly disturbed tip: possibly Lewis' Adit (Hughes 1992, p.90), though he seemed to indicate that its position lay approx. 50m south where tip forms are less convincing to locate an adit. As this extensive area of tips has been much removed,	SN7888344484
99345	Adit	POST MEDIEVAL	Vegetated gully with tip to the west, conincides with adit marked by Hughes 1992, p.90. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010	SN7885744404
99346	Mine Shaft	POST MEDIEVAL	Small quarry with tip to west conincides with site of Cowlings's Shaft marked by Hughes 1992, p.90. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7884644387
99347	Mine Shaft	POST MEDIEVAL	Shaft marked on early OS 1:2500 maps. Not examined in 2010. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7881644342
99348	Level	POST MEDIEVAL	Level marked on OS 1:2500 2nd ed: run in gully in forestry. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7891344379
99350	Adit	POST MEDIEVAL	Site of adit marked by Hughes 1992, p.90: in forestry, not examined in 2010. See PRNs 8880 and 17443 for further references. K Murphy based on R Protheroe Jones 2010.	SN7895044436
118179	FARMSTEAD	POST MEDIEVAL	A small farmstead with associated enclosures, recorded as 'Angred House and hill' on the Tithe map and apportionment (1841).	SN78414456
118180	ENCLOSURE	POST MEDIEVAL	A slightly trapezoidal enclosure 18m x 47-50 metres is recorded on the 1st and 2nd edition Ordnance Survey maps.	SN78474464

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# **APPENDIX II**

# Table 5: Newly recorded non-designated archaeological assets within the Nantymwyn study area

PRN	ТҮРЕ	PERIOD	DESCRIPTION	NGR
125678	Water Tank	Post Medieval	Linear tank like earthwork orientated roughly NE/SW, 15m x 3m x 1m deep, on SW side of chimney and Engine House PRN61156. Evidence of small channel at NE end.	SN7873344456
125679	Shaft	Post Medieval	Small circular hollow, possibly shaft, located on eastern side and adjacent to stone pitched dressing floor PRN99325	SN7895544790
125680	Launder	Post Medieval	Remains of wooden launders protruding from northern side of stream bank and SE of documentary buddles PRN99291	SN7818744672
125681	Building platform	Post Medieval	Remains of stone linear platform partially buried by spoil tips.	SN7821244664
125682	Mine Building	Post Medieval	Remains of ruined building, northern and western walls surviving in excess of 1m	SN7823044661
125683	Mine Building	Post Medieval	Visible remains of retaining wall on southern bank of Nant Bai stream	SN7824744660
125684	Mine Building	Post Medieval	Remains of low wall, c. 0.75m in height, orientated roughly N/S, at base of spoil tips PRN99302	SN7841044627
125685	Mine Building	Post Medieval	Remains of wall, partially buried by spoil and orientated roughly NW/SE, c. 1.2m in height at furthest NE end of Upper Boat Level	SN7842544676
125686	Mine Building	Post Medieval	Timber planks extruding from stone platform on southern side of Nant y Bai stream	SN7826944653
125687	Bank (Earthwork)	Post Medieval	Linear feature/ stone bank on southern side of Nant Bai stream, at western end of Upper Boat Level. Starts at SN7808944678 and ends at SN7810044676	SN7808944678
125688	Bank (Earthwork)	Post Medieval	Gorse covered linear earthwork c220m in length, orientated N/S, beginning in the 1920's mining area at SN7886744744 and finishing at SN7889044991. It is not shown on the historic OS mapping. It crosses through the interval between the development tips and adit portal of Level Tan PRN 99317 and is partially buried at its southern end by spoil tips.	SN7886644855
125689	Adit	Post Medieval	Angred Upper Adit - located below and to the west of Angred Engine House at the back of a narrow open cut (SN 78713 44449); the adit portal is obscured by vegetation but the drive can be seen to be open for at least 20 m and contains standing water impounded by debris at the portal. Coal Authority 11.02.21	SN7871344449
125690	Adit	Post Medieval	Angred Lower Adit - Further northwest a second lower open adit portal was identified (SN 78677 44484) and found to be similar in nature to that above. Coal Authority 11.02.21	SN7867744484
125691	Adit	Post Medieval	Top Level Roderick's Adit (SN 78885 44363) was located on a steep slope above the side wall of a small quarry northeast of Roderick's Lower Adit. The adit portal was found to be open and dry surrounded by forestry. Coal Authority 12.02.21	SN7888544363
125695	Level	Post Medieval	Likely level/Mine working identified on south east valley side of the Nant Bai stream, and north east of the Level Tan PRN99318, on 1946 RAF vertical photograph.	SN7906044981
125696	Level	Post Medieval	Likely level/Mine working identified on south east valley side of the Nant Bai stream, and north east of the Level Tan PRN99318, on 1946 RAF vertical photograph.	SN7913844947
125697	Level	Post Medieval	Likely level/Mine working identified on south east valley side of the Nant Bai stream, and north east of the Level Tan PRN99318, on 1946 RAF vertical photograph.	SN7910945101
125865	Mine Workings	Post Medieval	Area of large tip and concrete platforms and structures around New Shaft PRN99333	SN7878144606
125867	Reservoir	Post Medieval	Reservoir feeding the Nant Bai, shown on 1st ed 1:2500 OS map, northwest of the Maescarhyg Level Crushing Mill PRN99306	SN7860444833
125868	Mine Building	Post Medieval	Two buildings; one long rectangular building orientated NE-SW with smaller, square building at Northern end, and leat connecting reservoir PRN125867, shown on 1st ed 1:2500 map but is not shown on 2nd edition.	SN7863244807
125869	Mine Building	Post Medieval	Building shown on 1st ed 1:2500 OS map east of Crushing Mill PRN99297	SN7824844651
125870	Mine Building	Post Medieval	Building shown on 1st ed, 1:2500 OS map. No longer extant on 2nd edition	SN7820044653
125871	Mine Building	Post	Small, square building shown on 1st and 2n ed 1@2500 OS maps, located west of building PRN99298, Visible on 1946 RAF vertical photograph and suspicious conforming	SN7826644649

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		Medieval	square shaped tip identified on Coal Authority 25cm LiDAR	
125872	Canal	Post Medieval	Narrow canal shown on 1st and 2ed 1:2500 OS maps, serving Upper Boat Level. Eroded water course (outbye?) still extant	SN783414491
125873	Spoil Heap	Post Medieval	Spoil tip (likely run in) at NW end of likely level or hushing PRN125874 located in area of now cleared forestry, Northeast of the main Nantymwyn, "Upper Mine" area. Identified from Coal Authority's 2020 25cm LIDAR.	SN790044911
125874	Hush	Post Medieval	Possible hushing or level identified on 1946 RAF vertical photograph and visible on Coal Authority 2020 25cm LiDAR. Hushng orientated NW/SE and is headed by (run in?) tip PRN 125873 at NW end.	SN7901944902
125875	Hush	Post Medieval	Possible hushing or level identified on 1946 RAF vertical photograph and visible on Coal Authority 2020 25cm LiDAR. Hushng orientated NW/SE on north western side of modern forestry track.	SN7895344932
125876	Hush	Post Medieval	L shaped gully seen on 25cm Coal Authority LiDAR data. Located at North eastern extent of main mine/ Upper mine area, recently felled of forestry. It follows the bank in a NE/SW direction and terminates at a oval shaped crater PRN99321 at NE end. It is SE end is located c. 15m west of small circular possible shaft PRN125877.	SN7897144857
125877	Mine Shaft	Post Medieval	Circular shaft visible on Coal Authority 25cm LiDAR and described as Crudely fenced shaft in area of recently cleared forestry. Shaft expressed as minor depression. It is situated c. 15n east of possible hushing PRN125876	SN7899944835

