

PANDORA MINE, TREFRIW, CONWY

ASESIAD ARCHEOLEGOL / ARCHAEOLOGICAL ASSESSMENT



Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

PANDORA MINE, TREFRIW, CONWY

ASESIAD ARCHEOLEGOL / ARCHAEOLOGICAL ASSESSMENT

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CRYNHODEB ANHECHNEGOL

Ym mis Mawrth 2021 comisiynwyd Ymddiriedolaeth Archeolegol Gwynedd gan BINNIES i gynnal asesiad archeolegol yn hen Bwll Glo Pandora, ger Trefriw, Conwy, cyn adeiladu strwythur monitro llif ar Lefel Pandora Pontifex. Mae hanes y pwll yn Pandora wedi'i gofnodi'n gymharol dda felly mae'r asesiad wedi'i gyfyngu i gyfyngiadau'r pwll ac yn canolbwyntio ar ddiweddaru'r cofnodion a luniwyd yn flaenorol. Nododd yr asesiad desg a'r arolwg maes 20 nodwedd o fewn ffiniau safle Pandora Mine er y credir na fyddai adeiladu strwythur monitro llif i lawr yr afon o Adit Pontifex yn effeithio'n andwyol ar unrhyw un o'r rhain wrth i'r ardal gael ei newid yn ystod y adeiladu maes parcio cyhoeddus ym 1983.

NON-TECHNICAL SUMMARY

In March 2021 Gwynedd Archaeological Trust was commissioned by BINNIES to undertake an archaeological assessment at the former Pandora Mine, near Trefriw, Conwy, ahead of the construction of a flow monitoring structure at Pandora Pontifex Level. The history of the mine at Pandora is relatively well documented therefore the assessment is restricted to the confines of the mine and focused on updating the records previously compiled. The desk-based assessment and field survey identified 20 features within the confines of the Pandora Mine site though it is believed none of these would be adversely affected by the construction of a flow monitoring structure downstream of the Pontifex Adit as the area was altered during the construction of a public car park in 1983.

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) was commissioned by BINNIES to undertake an archaeological assessment in relation to Surface Water Management engineering interventions options appraisal at Pandora Mine, near Trefriw, CCBC (NGR SH76266049; postcode LL27 0JA; Figure 01). The Pandora Mine is located to the south east of Llyn Geirionydd, within Snowdonia National Park. As stated in Natural Resources Wales, *NPS-PS-0027-15 CE0659 Pandora - Surface water and spoil management Black & Veatch | Scope of Services Rev 1* Dated 02/10/2020, a Surface Water Management engineering options appraisal is required that fully considers the site environmental setting and heritage. These works will inform outline and detailed design of one flow monitoring structure downstream of the Pontifex Adit at Pandora Mine (*ibid.*) Figure 02) and an assessment of the suitability of an existing structure upstream of the Pontifex Adit to collect flow monitoring data and ultimately calculate outflow from the Pontifex Adit (Pandora mine). The purposes of these works are to reduce the risk of a blow-out event at Pontifex Adit and reduce the erosion and transport of metal rich mine spoil that is produced by interaction between watercourses and mine features. Currently it is assumed that no single engineering intervention will be suitable across the area and a combination of interventions will likely be required (*ibid.*).

The archaeological assessment considers the heritage of the site and includes desk-based research and a field survey. The assessment was undertaken in March 2021 and was completed in accordance with the following guidance:

- *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* Version 1.1 (The Welsh Archaeological Trusts, 2018);
- *Guidelines for digital archives* (Royal Commission on Ancient and Historic Monuments of Wales, 2015);
- *Management of Archaeological Projects* (English Heritage, 1991);
- *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide* (Historic England, 2015);
- *Standard and Guidance for Desk Based Assessment* (Chartered Institute for Archaeologists, 2017);

- *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives* (Chartered Institute for Archaeologists, 2020).
- *Standard and Guidance for the Archaeological Investigation and Recording of Standing Buildings or Structures* (Chartered Institute for Archaeologists, 2014).

Gwynedd Archaeological Trust is certified to ISO 9001:2015 and ISO 14001:2015 (Cert. No. 74180/B/0001/UK/En) and is a Registered Organisation with the Chartered Institute for Archaeologists.

The key aims and objectives were to:

- Carry out a field survey of Pandora Mine site to assess and update on the current condition of sites since the 1995 report as well as anything that has been identified in the interim;
- Prepare a report using existing and updated baseline heritage data to inform the Surface Water Management engineering interventions options and advise on proposals for avoidance or mitigation record.

The archaeological assessment was monitored by the Gwynedd Archaeological Planning Service and was undertaken in accordance with an approved Written Scheme of Investigation ([Appendix I](#)). In line with the Gwynedd Historic Environment Record (HER) requirements, the HER was contacted at the onset of the project to ensure that any data arising was formatted in a manner suitable for accession to the HER under the guidance set out in *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (The Welsh Archaeological Trusts, 2018). The HER was informed of the project start date, location, grid reference and estimated timescale; the project was assigned HER Enquiry Number GATHER 1381 and the Event PRN is 46020. A bilingual event summary has been prepared for submission to the HER in accordance with their guidance.

Gwynedd Archaeological Trust is certified to ISO 9001:2015 and ISO 14001:2015 (Cert. No. 74180/B/0001/UK/En) and is a Registered Organisation with the Chartered Institute for Archaeologists.

2 METHODOLOGY

2.1 Introduction

Gwynedd Archaeological Trust undertook an archaeological assessment at the former Pandora Mine site, near Trefriw ahead of the construction of a flow monitoring structure downstream of the Pontifex Adit (Pandora Mine). Work already undertaken in the area includes two Archaeological Assessments (Dutton, Roberts & Vernon, 1995, and Thomas, 1998), the Gwynedd Metal Mines Survey (Gwyn, 1998) and most recently the Uplands Archaeology Initiative Field Survey. Llyn Cowlyd – Capel Curig (Kenney, 2014). Therefore, the aim of this assessment was to update the information already known about the Pandora Mine site and ascertain if there are any currently unknown heritage assets within the area. The assessment and field survey were undertaken in March 2021 and a gazetteer has been produced based on this work.

2.2 Assessment (Desktop Study)

A desk-based assessment is defined as “a programme of study of the historic environment within a specified area or site on land, the inter-tidal zone or underwater that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage....Significance is to be judged in a local, regional, national or international context as appropriate” (ClfA 2017, 4).

The desk-based assessment involved a study of the following resources:

1. The regional Historic Environment Register ((HER) Gwynedd Archaeological Trust, Craig Beuno, Ffordd y Garth, Bangor, Gwynedd LL57 2RT) was examined for information concerning the study area, defined as Pandora Mine, (PRN 20447) as located in Figure 01. Examination of HER data was undertaken, including the 6-inch and 25-inch County Series Ordnance Survey maps and any secondary information held within the HER, including Bennett, J. & Vernon, R., 1995, *Mines of the Gwydyr Forest Part 6*, Dutton, L., Roberts, R. and Vernon, R., 1995, *Gwydyr Mines Archaeological Assessment*. Report 136, Thomas, D., 1998, *Gwydyr Archaeological Assessment*. Report No. 284. and Gwyn, D., 1998, *Gwynedd Metal Mines Survey*. Report 291. All identified features

relating to the Pandora Mine site were mapped, described and added to a gazetteer of sites and the relative importance of any sites defined;

2. The National Monuments Record of Wales (Royal Commission on the Ancient and Historical Monuments of Wales, Plas Crug, Aberystwyth SY23 1NJ) were checked for sites additional to the HER;
3. Aerial photographs from the National Monuments Record of Wales (Royal Commission on the Ancient and Historical Monuments of Wales, National Monuments Record of Wales, Plas Crug, Aberystwyth SY23 1NJ) were examined for potential features. This included 1946 RAF vertical aerial photographs;
4. Light Detection and Ranging (LiDAR) data was examined from the Lle Geo-Portal at <http://lle.gov.wales/home> for information on potential surface features using digital terrain modelling and digital surface modelling.

2.3 Field Survey

A field survey was undertaken which incorporated the assessment study area, as outlined in red in Figure 02. The aim was to visit and record known features relating to the Pandora Mine within the proposed site for the installation of the downstream flow monitoring structure. The features were mapped and located in advance as part of the desk based assessment, using a combination of historic and GIS based data; this information was then used to geo-locate features, which were then located and described on GAT pro-formas. The sites were then added to the overall gazetteer and their relative importance defined. Any newly identified assets were also recorded. Only features that could be safely accessed were directly recorded. A photographic record was maintained in RAW format using a digital SLR set to maximum resolution (Nikon D3100; resolution: 4,608 × 3,072 (14.2 effective megapixels)) and photographic metadata table was completed and is included in the report ([Appendix III](#)). Photographic images were archived in TIFF format using Adobe Photoshop; the archive numbering system runs from G2682_001 to G2682_032.

The following categories have been used to define the assessment category of the archaeological asset:

Category A - Sites of National Importance.

Scheduled Monuments, Listed Buildings of grade II* and above, as well as those that would meet the requirements for scheduling (ancient monuments) or listing (buildings) or both. Sites that are scheduled or listed have legal protection, and it is recommended that all Category A sites remain preserved and protected *in situ*.

Category B - Sites of regional or county importance.

Grade II listed buildings and sites which would not fulfil the criteria for scheduling or listing, but which are nevertheless of particular importance within the region. Preservation *in situ* is the preferred option for Category B sites, but if damage or destruction cannot be avoided, appropriate detailed recording might be an acceptable alternative.

Category C - Sites of district or local importance.

Sites which are not of sufficient importance to justify a recommendation for preservation if threatened. Category C sites nevertheless merit adequate recording in advance of damage or destruction.

Category D - Minor and damaged sites.

Sites that are of minor importance or are so badly damaged that too little remains to justify their inclusion in a higher category. For Category D sites, rapid recording, either in advance of or during destruction, should be sufficient.

Category E - Sites needing further investigation.

Sites, the importance of which is as yet undetermined and which will require further work before they can be allocated to categories A - D are temporarily placed in this category, with specific recommendations for further evaluation.

The impact of the proposed works on any asset has been identified using the following impact criteria:

None:

There is no construction impact on this asset.

Slight:

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

Unlikely:

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

Likely:

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

Significant:

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

Considerable:

The total removal of an asset or its partial removal which would effectively destroy the remainder of the site.

Unknown:

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

2.4 Data Management Plan

Archiving was completed based on the following task list;

1. Pro-formas: all cross referenced and scanned for digital archiving;
2. Photographic Metadata: cross-referenced with all pro-formas and completed in *Microsoft Excel*;

This data was then used as the basis for the physical and digital dataset archives; information from these were then used to compile the project report. The physical archive is stored in a designated project folder and the location confirmed in the Trust project database; the digital dataset is stored on a dedicated Trust server, with the location confirmed in the Trust project database via a specific hyperlink. External datasets for the HER and RCAHMMW are as defined in the dissemination strategy below. There is no de-selected digital data.

The following dissemination and archiving of the report and digital dataset has been applied:

- A digital report has been provided to the client and GAPS (draft report then final report);
- A digital report has been provided to the regional Historic Environment Record, along with a digital dataset comprising an Event PRN summary. The report and dataset will be submitted in accordance with the required standards set out in *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (Version 1.1); and
- A digital report and digital archive dataset has been prepared for submission to the Royal Commission on Ancient and Historic Monuments, Wales (final report only), in accordance with the *RCAHMMW Guidelines for Digital Archives Version 1*. The dataset has been prepared in the format required by RCAHMMW and includes:
 - Photographic metadata (Microsoft Access);
 - Photographic archive (TIFF format);
 - Project Information form (Excel);
 - File Information form (Excel) – Microsoft Word report text final;
 - File Information form (Excel) – Photographic metadata (general);
 - File Information form (Excel) – Adobe PDF report final; and
 - File Information form (Excel) - Photographic metadata (detail).

2.5 Gazetteer of Features

A gazetteer has been compiled for any existing and newly identified assets within the Pandora Mine site, based on information sourced from the desk based assessment and field survey.

The gazetteer has been prepared in the following format:

Feature Number	
Site name	
PRN number	
Grid reference	
Period	
Site type	
Assessment category	
Description	
Impact	
Recommendation for further assessment/evaluation	
Recommendation for mitigatory measures	

3 RESULTS

3.1 Desk based assessment

3.1.1 *Location and geological summary*

The Pandora mine is located near Trefriw in the Conwy Valley, to the south east of Llyn Geirionydd. The workings are located on four lodes that produced both lead and zinc during the lifetime of the mine. Bedrock geology in the area of the mine is a Mudstone of the Nod Glas Formation, a sedimentary bedrock formed during the Ordovician Period. These sedimentary rocks are from a shallow-marine origin (BGS, 2021).

3.1.2 *Statutory and non-statutory designations*

An examination of the Historic Environment Record revealed no known Listed Buildings or Scheduled monuments within the Pandora Mine Site. Pandora Mine is situated in the Coed Gwydir Historic Landscape Area (SNPHL109) of the Snowdonia National Park. The area formed the nucleus of the Gwydir estate, which was developed during the 18th and 19th Centuries for mineral extraction.

3.1.3 *Historical and archaeological background*

3.1.3.1 Introduction

Pandora Mine is located to the south east of Llyn Geirionydd near Trefriw. The mine itself has a recorded history dating from the 1840's which will be discussed further in section 3.1.4 below. Within the Pandora Mine site there are five HER assets that pre-date the mining activity in the area.

- Chape, Findspot, Llanrwst (PRN 24142) – Post-Medieval Copper Alloy chape with ribbed foot and embossed decoration found some years ago in the top of a mound (GAT PRN 26156) whilst using a metal detector.
- Palstave, Findspot, Llanrwst (PRN 24143) – Bronze Age Denuded copper alloy unlooped palstave in two fragments, found some years ago in the top of a mound (GAT PRN 26156) whilst using a metal detector.
- Mound, Tyn y Groes (PRN 26156) – Bronze Age Mound
- Mound, Tyn y Groes (PRN 26157) – Bronze Age Mound
- Ridge and Furrow, Tyn y Groes (PRN 26158) – Medieval Ridge and Furrow

3.1.3.2 Post-Medieval and Modern

Sir John Wynn of Gwydyr (1553-1627), master of the Gwydyr estate from his seat at Gwydyr Castle, appears to be the first person to attempt to capitalise on the lead ore located on his land by obtaining a lease for lead mines 'on the wastes and commons' around Llanrwst (Bennett & Vernon, 1995). After his death in 1627, Sir Maurice and Sir Owen Wynn continued to have a passing interest in the lead mines until the death of Sir Owen Wynn in 1666 (Ibid). With the amalgamation of the Gwydyr Estate with the Ancaster Estates on the marriage of Mary Wynn (heiress to Gwydyr) in 1678, all interest in working the lead mines appears to have been lost. In 1752 the 3rd Duke of Ancaster invited Dr Linden to establish himself on the estate in order to exploit the minerals (Ibid). Records from this period are sparse but it appears that mining continued on the Gwydyr Estate for the next 60 years (Ibid).

There are no known records relating to the beginnings of Pandora mine although it is suspected that John Harker may have begun mining at the site around 1800 and by 1843 Pandora was regarded as an old mine (Dutton, Roberts & Vernon, 1995). Initial works at Pandora (then known as Foel Ddu) between 1843 and 1868 focused on clearing out the old workings, with small quantities of lead ore raised and a few tons of blende washed from the surrounding hills (Bennett & Vernon, 1995). A 3 year lease on Foel Ddu Mine was obtained by Goddard & Co. in 1868 which led to an increase in productivity on the site, 119 tons of ore were raised in 1870 with 18 men being employed by the company (Ibid). Successful mining attracted investment and the Willoughby Mining Company Ltd. took over the lease in 1871, constructing a mine office, waterwheel pits and sinking an engine shaft (Pyne's Shaft) on the Goddards Lode (Dutton, Roberts & Vernon, 1995; Figure 03). Unfortunately insufficient water to work the machinery in summer and high winds and frozen leats in the winter made it difficult to make the mine profitable. The Pandora Lead Mines Ltd took over the lease in 1878, the site was under the same management but financially restructured (Ibid). By 1881 the Pynes Shaft had been sunk to the 45 fathom level and a tramway was planned in order to more effectively move ore around the mine site. However, falling lead prices in 1882 sent the company into receivership (Ibid).

Alfred Endean of the Llanrwst Mine acquired the lease to Pandora in 1884 and quickly created the Standard Lead Company Ltd. A modernisation scheme was undertaken including the sinking of the shaft to the 55 fathom level but any success was short lived and site was up for sale by 1888 (Ibid). The Welsh-Foxdale Company took over the mine in 1894 but was not very successful and little development took place before 1899 when a subsidiary company, the Welsh Spelter Company Ltd was formed and commenced work at Pandora (Ibid).

The priority of the Welsh Spelter Company was controlling the water in the mines and work on the Pontifex Adit was started. By 1901 the company had built a house with managers office for the mine captain, a general office, a miners dry house, a carpenters shed, a large barrack house and a smithy. An electric generating station had been built next to the Pontifex Adit and a tramway that connected the mine to Klondike Mill (Ibid; Figure 04). Falling spelter prices however necessitated the sale of Pandora Mine and Klondike Mill in 1907. James Griffith took up in lease and continued work on the Pontifex Adit which was connected to the Pandora Mine workings in 1908 after which he sold the site to the New Pandora Lead Mining Company (Ibid). Operations were confined to mining ore with activity on site ceasing in 1912 (Ibid). During 1912, nearby Hafna Mines acquired the Pandora site but this was mainly to harness the Electricity Generating Station near the Pontifex Adit (Ibid). After the First World War development at Pandora was confined to the area around Pynes Shaft, the tramway linking the mine to Klondike Mill had been dismantled probably to provide iron for the war effort. The last proper effort to mine at Pandora was undertaken by the Eagle Lead Co. Ltd. in 1920 however, the ore at Pandora proved to complex for the oil flotation method they were using to separate materials and the company was wound up in 1930 (Ibid).

3.1.3.3 Cartographic Evidence and History of Land Ownership

The history of the land and mine ownership is well established (see section 3.1.3.1 and 3.1.3.2 above) therefore the tithe map was not consulted. The First to Third Edition 1-inch to 25-mile Ordnance Survey Caernarvonshire County Series Map Sheets XVIII.8 (published 1889, 1900 and 1913 respectively; cf. Figures 05, 06 and 07) show the development of the mine infrastructure. On the First Edition map, the mine is listed as Willoughby Lead Mine, visible as a compilation of a shaft, tramway, buildings and two reservoirs and associated sluices. On the Second Edition Map, published eleven years later, it is now referred to as Welsh Foxdale Lead Mine and the visible infrastructure is less extensive with the disuse of the tramway and a lack of new and additional developments. The Third Edition map reveals a revival of the mine infrastructure consisting of a new mine and associated shafts, sluices, tanks, levels, bigger buildings, an aqueduct and a tramway.

3.1.4 Previous Historical and Archaeological Work

A detailed history of the Pandora Mine can be found in the *Mines of the Gwydyr Forest – Part 6 – Pandora and Other Mines in North West Gwydyr* by Bennet and Vernon. This survey was carried out by Bennett and Vernon between 1989 and 1995, and this includes a very detailed analysis of the 19th and 20th century phases of the mine's operation and the surviving standing evidence for this.

The *Gwydyr Mines Archaeological Assessment* by Dutton, Roberts and Vernon (GAT Report No. 136) was carried out in 1995 for the Snowdonia National Park Authority. They undertook a field survey which noted many extent features at Pandora though most of these are not on the HER and location data for the features within the report is not complete.

Dafydd Gwyn carried out the *Gwynedd Metal Mines Survey* in 1998 (GAT Report No. 291) and Thomas, D. 1998 *Forest Enterprise Welsh Heritage Assets Survey* (CPAT Report No. 284). Both of these reports cover metalliferous mining in the Gwydir Forest area. The main assets of the Pandora mine are noted including locational data, however not all were visited during the surveys.

3.1.5 Artefact potential

The likely presence of artefacts dating from the prehistoric to post-medieval times is thought to be high around the two Bronze Age mounds (PRN 26156 & 26157) and the Bronze Age Palstave (PRN 24143) found by a metal detectorist. Given the extensive nature and duration of the mining works on the site, the potential for the discovery of artefacts dating to the industrial and modern periods is considered to be high.

3.1.6 Aerial Photographs and LiDAR

3.1.6.1 Aerial Photographs

One historic aerial photograph of the Pandora Mine was examined dating from the 1940's which is listed below

- RAF AC31:H13:140 Image 17 taken on 16th April 1942 (Figure 08)

An inset from this photograph is included as Figure 09 which better shows the Pandora Mine site. The remains of the waterwheel pit (PRN 37282) can be clearly seen along with the winding house and other buildings at Pynes shaft. The tank and engine house with associated channel can be clearly discerned in the image, the latter adjacent to the Pontifex

Adit. The remains of the tramway can also be traced running from the Pandora Mine to Klondike Mill.

3.1.6.2 LiDAR

Lidar Composite 1m DTM and DSM data taken from the Welsh Government Lle Portal was examined. Although the mine site itself is not covered in the images available, the channel running from the tank to the now demolished engine house is clearly visible on the digital terrain model (Figure 10). The remains of the old tramway can be seen on the digital surface model (Figure 11).

3.2 Field Survey

The field survey was undertaken on the 15th March 2021. All assets identified during the desk-based assessment were visited where this was possible, although some were inaccessible due to safety considerations, or were not visible in dense woodland. The area was also examined for further evidence on the ground of any other features related to the Pandora Mine. A descriptive and photographic record was maintained during the survey, and the sites identified are listed in the gazetteer below (section 3.3).

3.3 Gazetteer of Features

3.3.1 Introduction

All the sites included in the gazetteer are shown on Figure 12. All recommendations are based on the current understanding of the scheme proposals and their impact on the features, and may have to be revised if information about the scheme impacts changes. In the event of alterations to the scheme, the recommendations might have to be revisited.

The archaeological assessment results for Pandora Mine from the 1995 report completed by Gwynedd Archaeological Trust (Dutton, Roberts & Vernon, 1995) and the 1998 report completed by Clwyd Powys Archaeological Trust (Thomas, 1998) were used as the basis of the current gazetteer and supplemented with any new assets identified. 13 assets (Features 1-13) are already registered on the HER. Features 14-20 are either detailed in the previous reports but not on the HER or new features located during the field survey.

3.3.2 Assessment Category

As stated in [para. 2.4](#), the sites recorded in the archaeological assessment have been divided into five categories (A to E), based on national (Category A), regional (Category B) or district/local importance (Category C), or whether they are minor sites (Category D) or sites needing further investigation (Category E). These categories are generally comparable to those used for the 1998 assessment, particularly Categories A (National Importance), B (Regional Importance) and C (lesser significance), with Category E from the 2021 assessment comparable to the *Not Yet Evaluated* category from 1998; the *No Physical Presence* category from the 1998 assessment has not been duplicated for the current assessment.

A key consideration for the current assessment has been whether the assessment categories used in 1998 assessment are applicable and equivalent to the 2021 assessment and this is analysed and discussed in each gazetteer entry.

The current assessment has also considered the appearance and condition of the identified sites, comparing information from the 2021 survey with the 1998 survey. It was found in most cases that whilst the location of the sites identified in 1998 were often visible, many were inaccessible due to vegetation overgrowth and/or safety limitations. Where necessary, the gazetteer entries have used the site descriptions from the 1998 survey; it is stated in the gazetteer where original descriptions have been used.

For the purposes of the gazetteer, assets are given feature numbers.

3.3.3 Pandora Mine Gazetteer

Feature Number	01
Site name	Pandora, Pontifex Level
PRN number	8891
Grid reference	SH7632060400
Period	Post medieval
Site type	Adit
Assessment category	C
Description	<p>Adit cut running east towards the mine workings at Pandora. Work commenced at the Pontifex Adit in 1899 and was joined to the mine workings in 1908 (Dutton, Roberts & Vernon, 1995). Currently located adjacent to a public car park, which was created in 1983 levelling most of the dressing floor site and the engine house. A stone lined adit portal exposed on north side; wooden posts block access. Area is fenced for safety in overhanging spruce and broadleaf (Thomas, 1998).</p> <p>The Pontifex Adit during the current field survey appears to be relatively unchanged from 1998 though it could only be viewed from the car park side of a safety fence (Plates 01-03).</p>
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	02
Site name	Metal Mine, New Pandora, Gwydyr Forest
PRN number	21012
Grid reference	SH767603
Period	Post Medieval
Site type	Metal Mine
Assessment category	C
Description	<p>The Pandora Mine is located to the south east of Llyn Geirionydd near Trefriw in the Conway Valley. The mine has a recorded history from the 1840s and was last worked in the 1920s. Altogether four main lodes, and several minor ones, were worked. Many of the features around the main shaft (Pynes Shaft) date from this century, whilst other features, adjacent to the road to Llyn Geirionydd, date from between 1878 and 1880. Pandora started life as a lead mine, but around the end of the 19th century became a zinc producer. Peripheral remains include tramways, reservoirs and leats. During its history the mine has been referred to as Foel Ddu, Willoughby, Pandora, Welsh-Foxdale and the Eagle. However, the name Pandora is in general usage for this mine site. (Dutton, Roberts & Vernon, 1995).</p> <p>This is a general PRN covering the mine site as a whole. Individual elements of the mine site that are still extent have been assigned new PRN numbers and are discussed later in the gazetteer.</p>
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	03
Site name	Pandora Reservoir II
PRN number	9037
Grid reference	SH 7693360097
Period	Post medieval
Site type	Reservoir
Assessment category	E
Description	<p>Reservoir marked on OS map of 1901. Not yet evaluation (Thomas, 1998).</p> <p>This site was not accessed during the walk over survey but is clearly visible on satellite imagery covering the area and appear relatively unchanged.</p>
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	04
Site name	Pandora Reservoir I
PRN number	9038
Grid reference	SH 7705060115
Period	Post medieval
Site type	Reservoir
Assessment category	E
Description	<p>Reservoir marked on OS map of 1901. Not yet evaluation (Thomas, 1998).</p> <p>This site was not accessed during the walk over survey but is clearly visible on satellite imagery covering the area and appear relatively unchanged.</p>
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	05
Site name	Pandora Shaft
PRN number	9039
Grid reference	SH 7670659933
Period	Post medieval
Site type	Shaft
Assessment category	E
Description	<p>Shaft noted in FE mines database. Part of Pandora Mine (Thomas, 1998).</p> <p>Not accessed during the field survey due to health & safety.</p>
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	06
Site name	Foel Ddu Mine, Trefriw
PRN number	21595
Grid reference	SH767601
Period	Post Medieval
Site type	Lead Mine
Assessment category	C
Description	<p>Area of lead mining with a complex history from 1870s. The area was mined by several different companies under different names (Bennett & Vernon, 1995 and Kenney, 2014).</p> <p>This record should be considered a duplicate of PRN 21012 (Feature 02).</p>
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	07
Site name	Mound, Tyn y Groes
PRN number	26156
Grid reference	SH7657060019
Period	Bronze Age
Site type	Mound
Assessment category	C
Description	<p>Bronze Age mound which has produced finds when investigated by metal detectorists (See PRN 24142 – Feature 9 & PRN 24143 – Feature 10).</p> <p>Not accessed during field survey</p>
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	08
Site name	Mound, Tyn y Groes
PRN number	26157
Grid reference	SH7652359988
Period	Bronze Age
Site type	Mound
Assessment category	C
Description	Bronze Age Mound, possibly related to PRN 26156 – Feature 07. Not accessed during field survey
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	09
Site name	Chape, Findspot, Llanrwst
PRN number	24142
Grid reference	SH7660
Period	Post Medieval
Site type	Findspot
Assessment category	C
Description	Copper Alloy chape with ribbed foot and embossed decoration found some years ago in the top of a mound (PRN 26156 – Feature 07) whilst using a metal detector. The object has been made from a minimum of two pieces: an embossed sheet, folded around to form a flattened, hollow cone; and a domed and ribbed solid knob, attached to the narrowest part of the cone. The seams are visible on the reverse although it is unclear whether they were soldered together (GAT HER, 2021).
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	None

Feature Number	10
Site name	Palstave, Findspot, Llanrwst
PRN number	24143
Grid reference	SH7660
Period	Bronze Age
Site type	Findspot
Assessment category	C
Description	Denuded copper alloy unlooped palstave in two fragments, found some years ago in the top of a mound (PRN 26156 – Feature 07) whilst using a metal detector (GAT HER, 2021).
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	None

Feature Number	11
Site name	Ridge and Furrow, Tyn y Groes
PRN number	26158
Grid reference	SH7655059996
Period	Medieval
Site type	Ridge and Furrow
Assessment category	C
Description	Medieval ridge and furrow noted during a site visit undertaken during 2009 in response to metal detector finds (Features 09 and 10) (GAT HER, 2021).
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	12
Site name	Dressing floor, Willoughby, Pandora Mine
PRN number	37282
Grid reference	SH7655059861
Period	Post Medieval
Site type	Dressing Floor
Assessment category	C
Description	<p>Dressing floor used by both Willoughby and Pandora mines at different times and with differing structures (Bennett & Vernon, 1995 and Kenney, 2014).</p> <p>No extent remains of the dressing floor was noted during the field survey however the waterwheel pit, erected in 1871 by the Willoughby Mining Company (Dutton, Roberts & Vernon, 1995) is still clearly visible in the landscape and has not changed since it was last visited during 2014 (Plates 04-05).</p>
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	13
Site name	Spoil Tip, Ffrith Talyllyn Mine
PRN number	37603
Grid reference	SH76370598030
Period	Post Medieval
Site type	Spoil Heap
Assessment category	C
Description	<p>A linear tip with a barrow run along the top. It runs from an adit at the SW. Dimensions, 80m x 14m. Truncated at the East (Kenney, 2014).</p> <p>Not accessible during the field survey.</p>
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	14
Site name	Water Tank, Pandora Mine
PRN number	91912
Grid reference	SH7655860323
Period	Post Medieval
Site type	Water Tank
Assessment category	C
Description	<p>Partially demolished building that used to house the water tank to feed the water turbine engine generating station adjacent to the Pontifex Adit.</p> <p>The tank and engine station were installed around 1901 during the developments at the site by the Welsh Crown Spelter Company (Dutton, Roberts & Vernon, 1995; See Figure 04).</p> <p>A channel running from the tank building down the field to the west can still be seen and was noted during the field survey and on the Lidar. The tank building was not accessed directly during the field survey but it is clearly visible in the landscape from the current flow monitoring apparatus at the Pontifex Adit (Plate 06) and from the area of Pynes Shaft.</p>
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	15
Site name	Tramway, Pandora Mine
PRN number	91913
Grid reference	SH7630859998 (Location of Plate ??)
Period	Post Medieval
Site type	Tramway
Assessment category	C
Description	<p>Tramway running south west from the mine and down the hill to Llyn Geirionydd where it runs along the lake to Klondike mill. The tramway was installed by the Welsh Crown Spelter Company around 1901 and appears to have been dismantled during the First World War as the iron rails would have been vital to the war effort (Dutton, Roberts & Vernon, 1995; See Figure 04).</p> <p>During the field survey the remains of the tramway could still be seen in the landscape at various locations (Plates 07-08). It is somewhat obscured by trees to the immediate south west of the Pandora Mine site but the remains of a stone culvert was clearly seen over a small stream (Plate 09).</p>
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	16
Site name	Pynes Shaft Winding house and headframe supports
PRN number	91914
Grid reference	SH7675060263
Period	Post Medieval
Site type	Winder House
Assessment category	C
Description	<p>Winder house near Pynes shaft. First winding wheel was erected in 1871 by the Willoughby Mining Company and was then replaced by Alfred Endean around 1884 (Dutton, Roberts & Vernon, 1995; See Figure 03).</p> <p>The remains of the winder building were noted during the field survey and look to be in a similar condition to that observed and recorded during the 1995 survey (Plate 10).</p>
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	17
Site name	Eagle Flotation Mill, Pandora Mine
PRN number	91915
Grid reference	SH7668460268
Period	Post Medieval
Site type	Mind Building
Assessment category	D
Description	<p>Oil flotation mill constructed at Pandora mine by the Eagle Lead Co. between 1926 and 1928 (Dutton, Roberts & Vernon, 1995).</p> <p>Currently this area is being used as animal pens with very little concrete remains that relate to the oil flotation mill (Plate 11).</p>
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	18
Site name	Managers house remains, Pandora Mine
PRN number	91916
Grid reference	SH7677360271
Period	Post Medieval
Site type	Mine Building
Assessment category	D
Description	<p>Remains of a stone and concrete building, from cartographic and photographic evidence it appears to be the remains of the house built for the Mine Captain by the Welsh Crown Spelter Company in 1901 (Bennett & Vernon, 1995; See Figure 04).</p> <p>Most of the building has now been removed, presumably robbed for stone (Plate 12).</p>
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	19
Site name	Mine Building, Pandora mine
PRN number	91917
Grid reference	SH7673560246
Period	Post Medieval
Site type	Mine Building
Assessment category	D
Description	Remains of a concrete building, probably the Survey/Assay Office (Plate 13) noted during the 1998 survey (Gwyn, 1998). Built by the Welsh Crown Spelter Co in 1901 (Dutton, Roberts & Vernon, 1995; See Figure 04).
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	20
Site name	Powder Magazine, Pandora Mine
PRN number	91918
Grid reference	SH7666459918
Period	Post Medieval
Site type	Powder Magazine
Assessment category	C
Description	<p>The powder magazine shown of the map of the Pandora Mine (Willoughby Mine) of 1875 (Dutton, Roberts and Vernon, 1995; See Figure 03 & 04).</p> <p>The powder magazine was noted as having a roof in the survey undertaken by Gwyn in 1998.</p> <p>There is currently no roof on the powder magazine (Plate 14) though some new wood has been added in order to reinforce the entrance by the landowner who also plans on reinstating the roof (per comms).</p>
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

4 CONCLUSIONS AND RECOMMENDATIONS

Gwynedd Archaeological Trust (GAT) was commissioned by BINNIES to undertake an archaeological assessment in relation to Surface Water Management engineering interventions options appraisal at Pandora Mine, near Trefriw. The Pandora Mine is located to the south east of Llyn Geirionydd, within Snowdonia National Park and has a documented history from the 1840's to the 1940's though undoubtedly work was undertaken on site before this date.

Work on the Pontifex Adit was begun in 1899 and completed in 1908 in order to dewater the mine workings. Water appears to still be flowing out of the adit itself though it is hard to see clearly how much water is coming directly from the mine as close access is not available due to health and safety. A large amount of water can be seen running down the hillside adjacent to the Pontifex Adit entrance, this runs down from the stream the current flow monitoring apparatus is sited on. The area around the outflow of the Pontifex Adit was developed into a public car park in 1983 therefore the siting of a flow monitoring structure in this area is unlikely to damage any historic assets.

In total 20 assets were found during the assessment, 13 already within the Historic Environment Record, 7 either known from previous literature but not on the HER or new features. No new features were found in the vicinity of the Pontifex Adit or around the current flow monitoring system. Considering the disturbance and sheer rock walls downstream of the Pontifex Adit any flow monitoring system placed here is highly unlikely to adversely affect any archaeological assets. Any monitoring system placed upstream of the adit, if built in a similar manner to the system already in place, is also considered highly unlikely to negatively impact any historic assets as ground disturbance would be limited to a small section of water eroded bank.

5 SOURCES CONSULTED

5.1 Primary Sources

Aerial Photographs and Lidar

RAF AC31:H13:140 Image 17 taken on 16th April 1942

Lidar Composite 1m DTM data taken from the Welsh Government *Lle Portal*

Lidar Composite 1m DSM data taken from the Welsh Government *Lle Portal*

5.2 Secondary Sources

Bennett, J. and Vernon, R.W., 1995. *Mines of the Gwydyr Forest – Part 6 – Pandora and Other Mines in North West Gwydyr*.

British Geological Survey. 2021. *Geology of Britain Viewer*. Accessed online at <https://mapapps.bgs.ac.uk/geologyofbritain/home.html?>

Dutton, L.A., Roberts, R.M., and Vernon, R.W., 1995. *Gwydyr Mines Archaeological Assessment* (GAT Report No.136)

English Heritage, 1991., *Management of Archaeological Projects*

English Heritage, 2015., *Management of Research Projects in the Historic Environment (MoRPHE)*.

GAT HER. 2021 *Gwynedd Archaeological Trust Historic Environment Record*. Accessed online at <https://archwilio.org.uk/arch/>

Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs) Version 1.1 (The Welsh Archaeological Trusts, 2018);

Guidelines for digital archives (Royal Commission on Ancient and Historic Monuments of Wales, 2015);

Gwyn, D., 1998. *Gwynedd Metal Mines Survey* (GAT Report No.291)

Kenney, J., 2014. *Uplands Archaeology Initiative Field Survey. Llyn Cowlyd – Capel Curig* (GAT Report No.1161)

Ordnance Survey 1889. First Edition Ordnance Survey 1-inch to 25-mile Caernarvonshire County Series Map Sheet XVIII.8

Ordnance Survey 1900. Second Edition Ordnance Survey 1-inch to 25-mile Caernarvonshire County Series Map Sheet XVIII.8

Ordnance Survey 1913. Third Edition Ordnance Survey 1-inch to 25-mile Caernarvonshire County Series Map Sheet XVIII.8

Standard and Guidance for Historic Environment Desk-Based Assessment (Chartered Institute for Archaeologists, 2017).

Standard and Guidance for the Archaeological Investigation and Recording of Standing Buildings or Structures (Chartered Institute for Archaeologists, 2014).

Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives (Chartered Institute for Archaeologists, 2020).

Thomas, D., 1998. *Forest Enterprise Welsh Heritage Assets Survey* (CPAT Report No.284)



Legend

Notes

Pandora Site



0.5 0 0.25 0.5 Kilometers

British_National_Grid

© Crown Copyright and database rights Ordnance Survey, Natural Resources Wales, 100019741, 2015. © Hawlfraint y Goron a hawl cronfa ddata Arrolwg Ordians, Cyfoeth Naturiol Cymru, 100019741, 2015. This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Figure 01 - Site Location © Crown Copyright and database rights Ordnance Survey, Natural Resources Wales, 100019741, 2015. Source: Binnies.

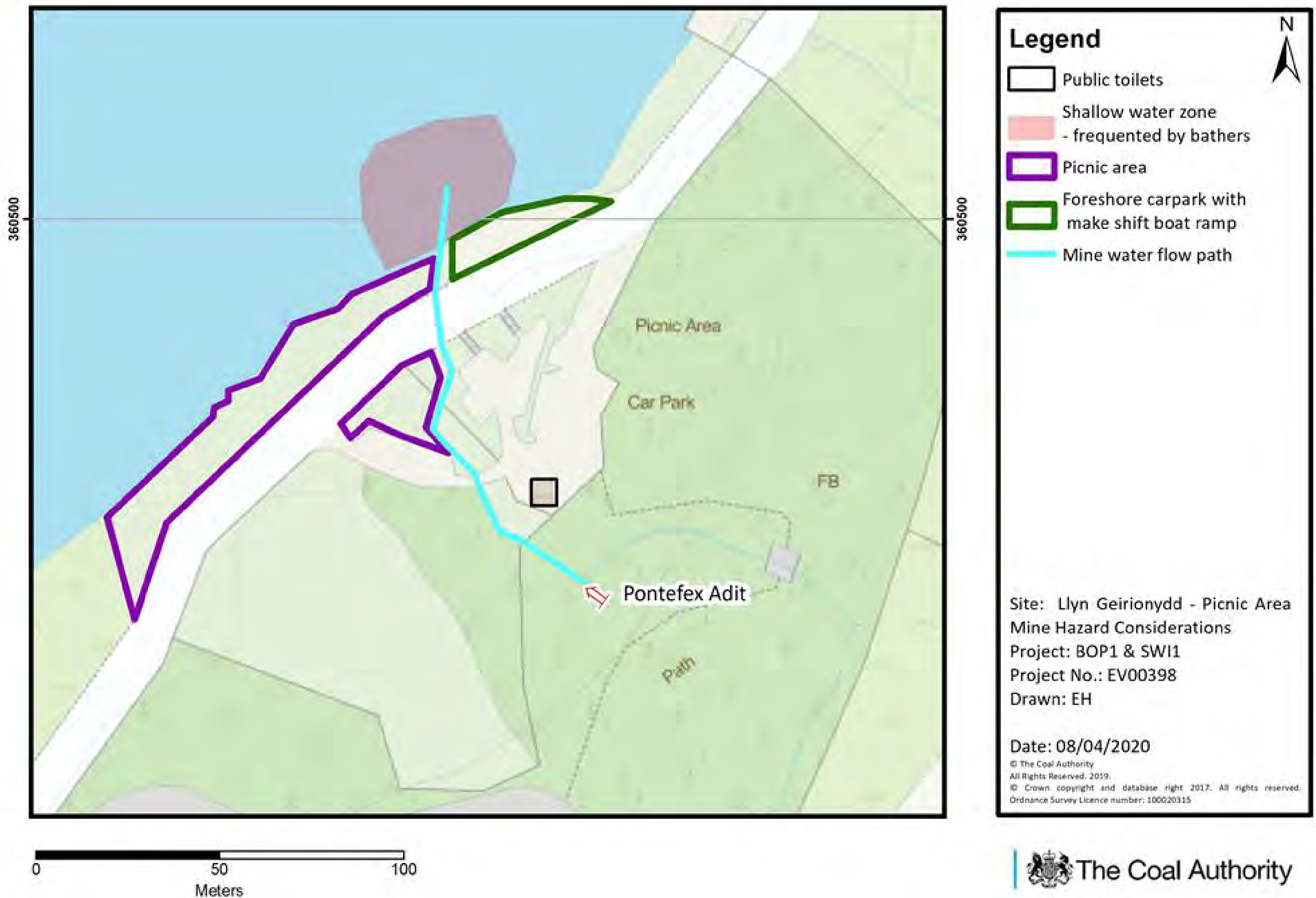
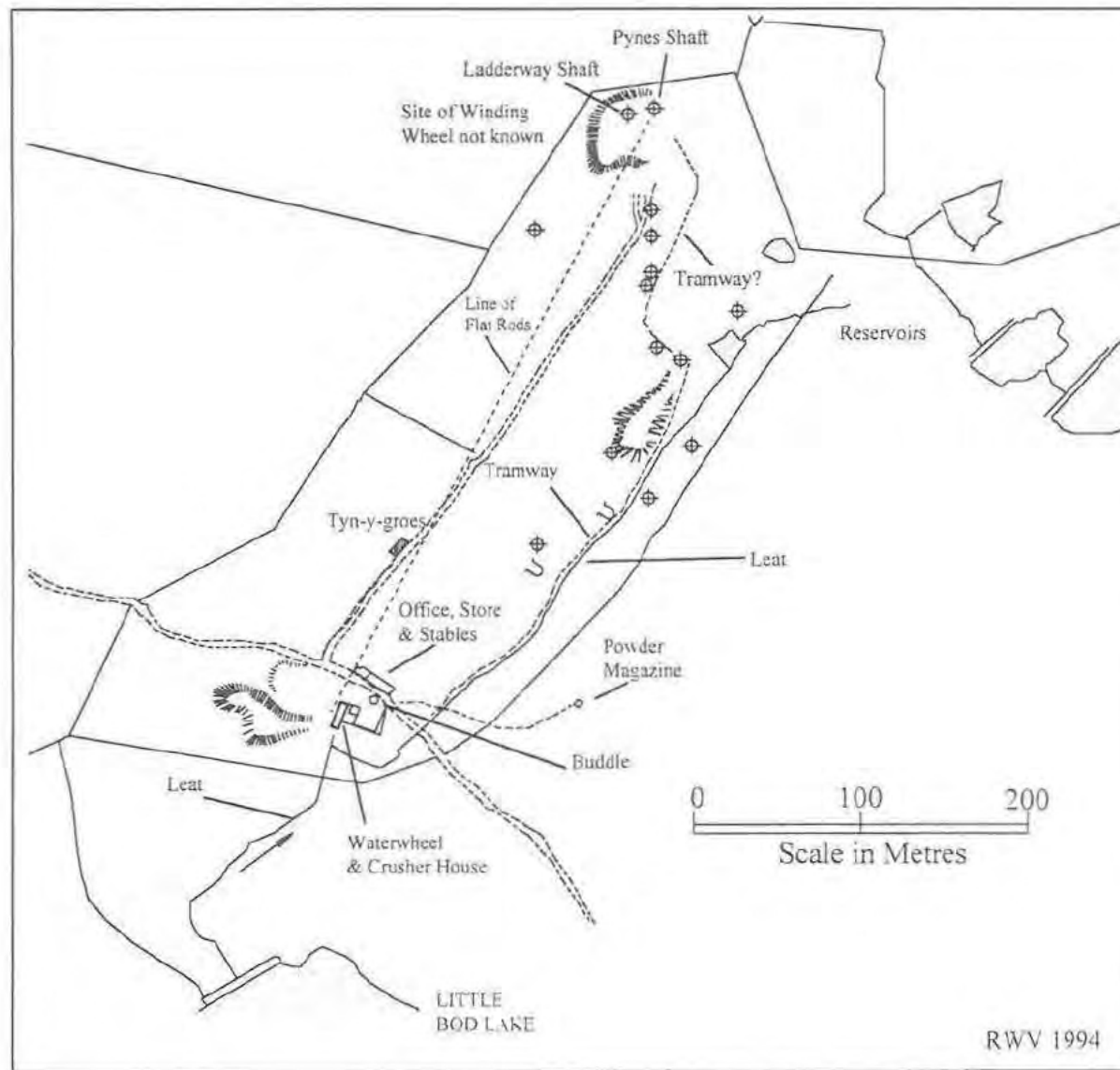


Figure 02 - Pontifex Adit outflow, Llyn Geirionydd car park/day-use area and anticipated flow monitoring locations. Source: Binnies.



Pandora Mine (Willoughby Mine) 1875.

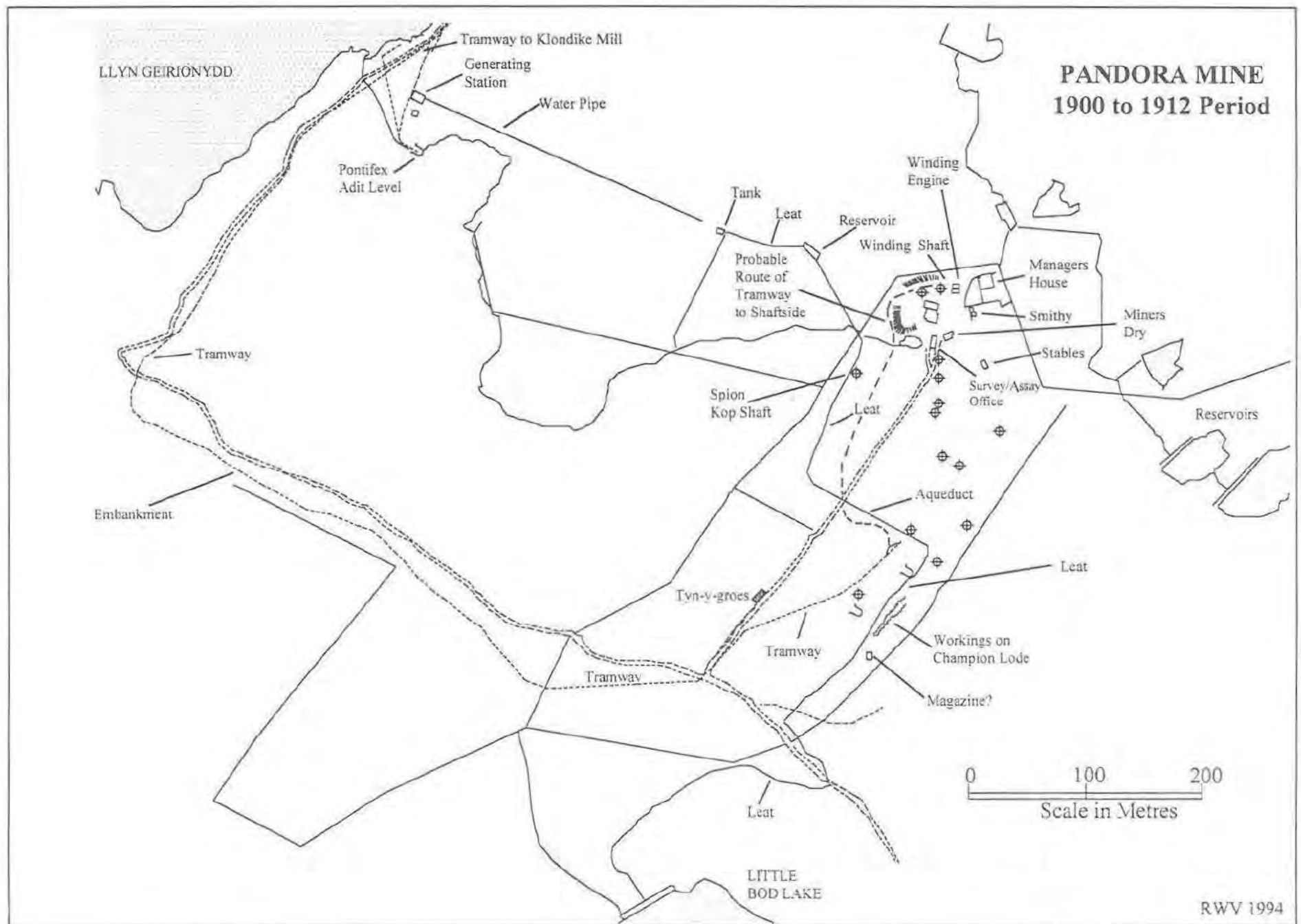


Figure 04 - Plan of Pandora Mine between 1900 and 1912. Source: Dutton, Roberts & Vernon, 1995. GAT Report No: 136.

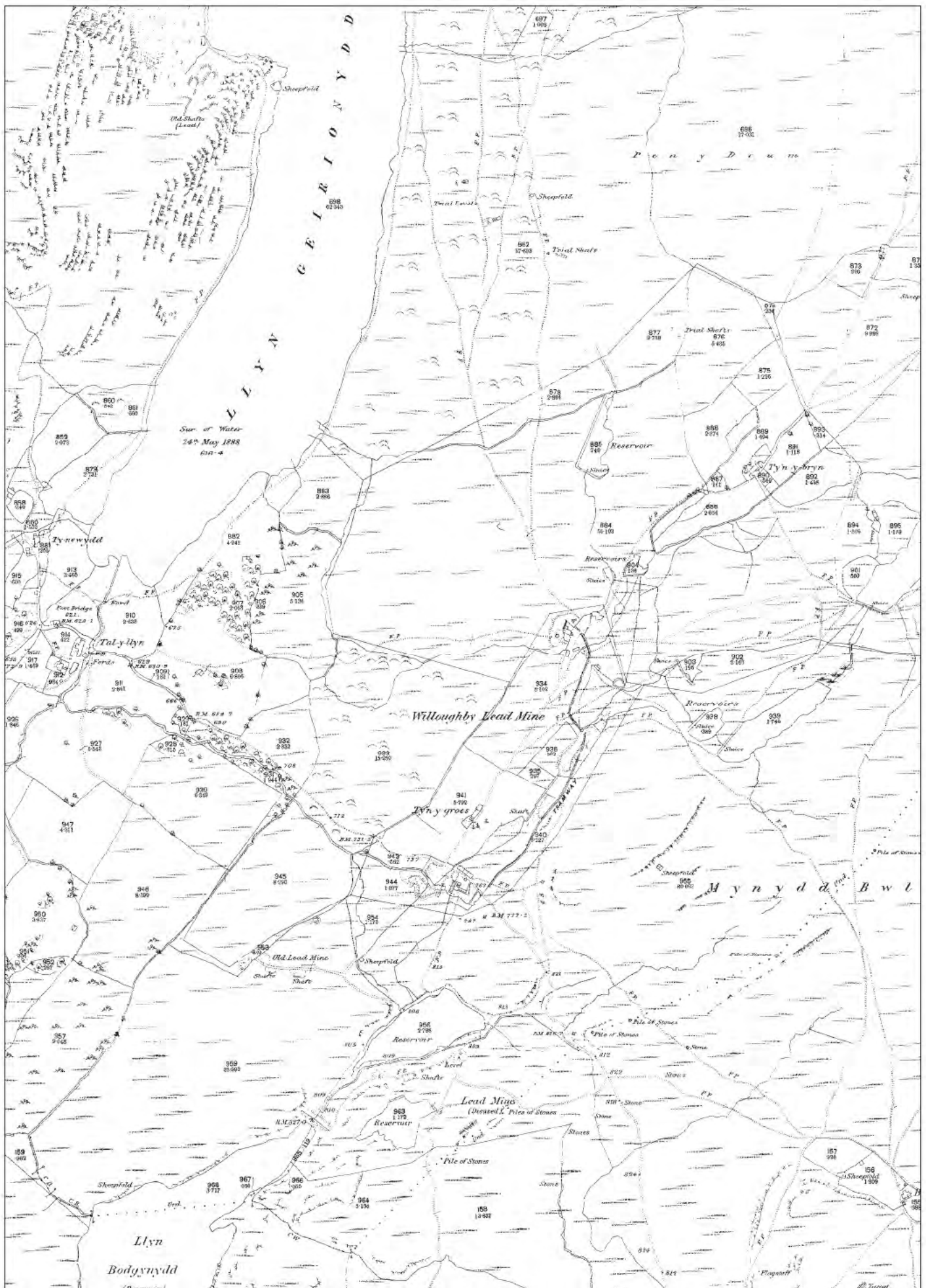


Figure 05 - Reproduction of Ordnance Survey First Edition 1-inch to 25-mile Caernarvonshire County Series Map Sheets XVIII.8, published 1889. Scale 1:7500@ A4.

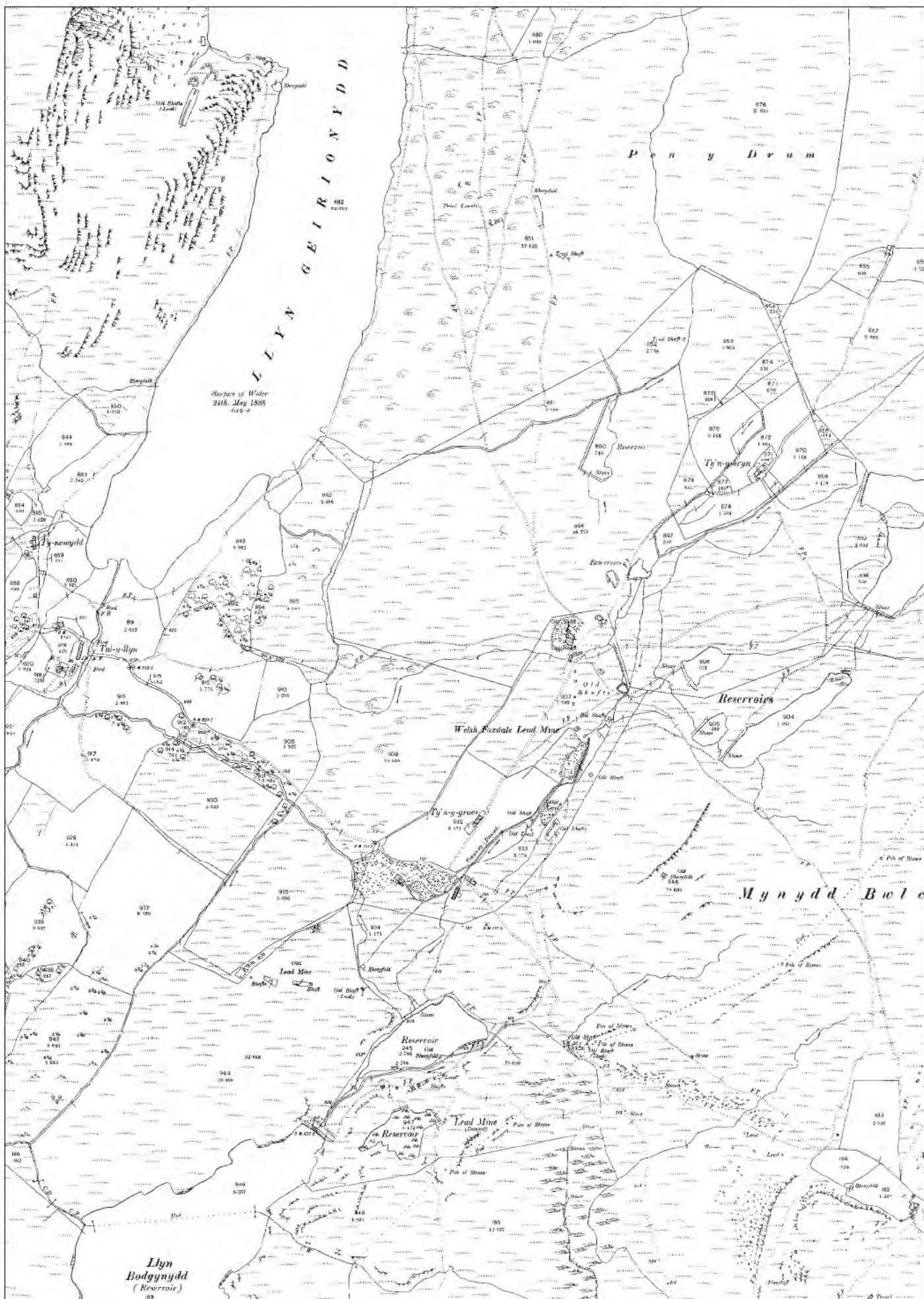
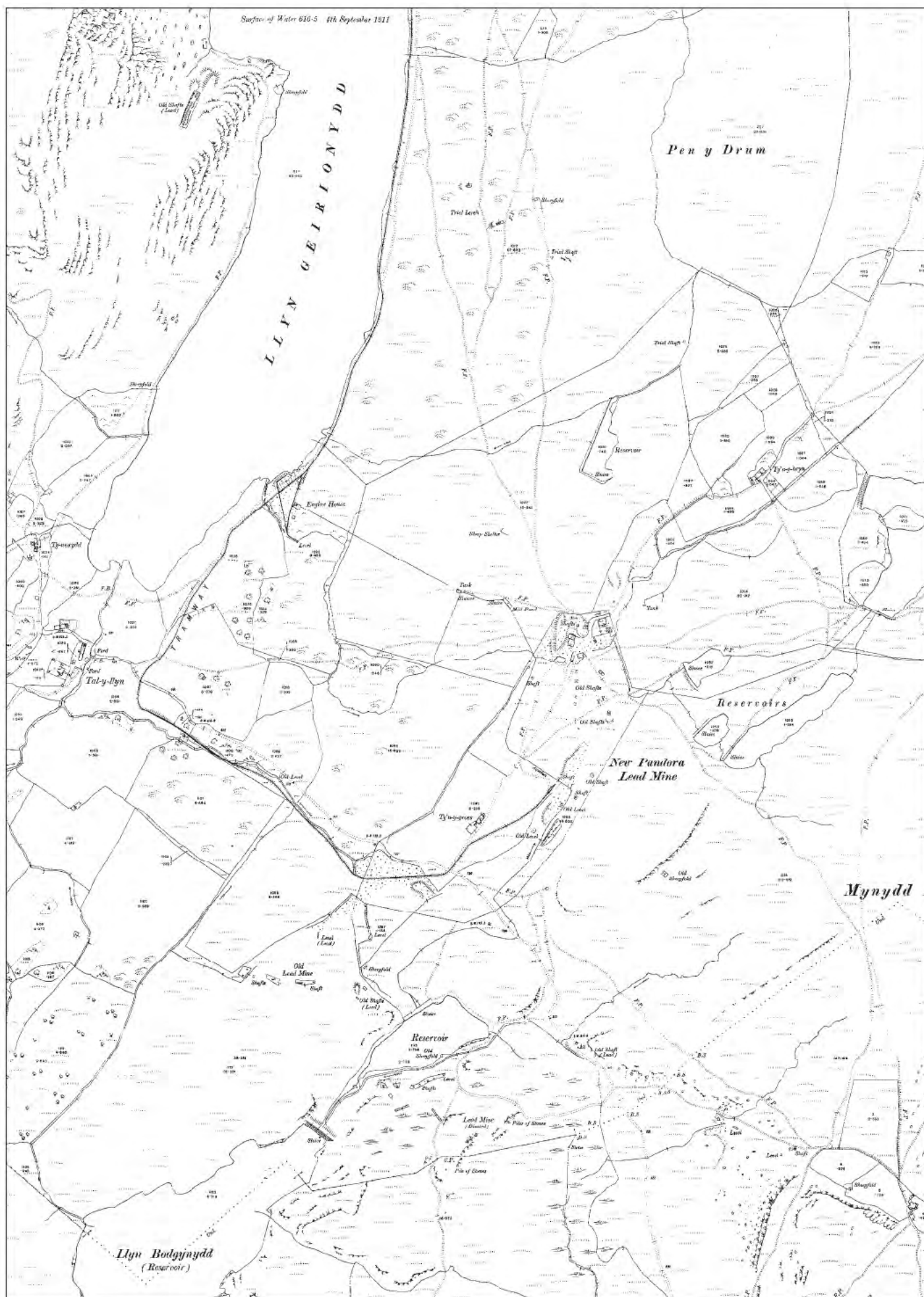


Figure 06 - Reproduction of Ordnance Survey Second Edition 1-inch to 25-mile Caernarvonshire County Series Map Sheets XVIII.8, published 1900. Scale 1:7500@ A4.



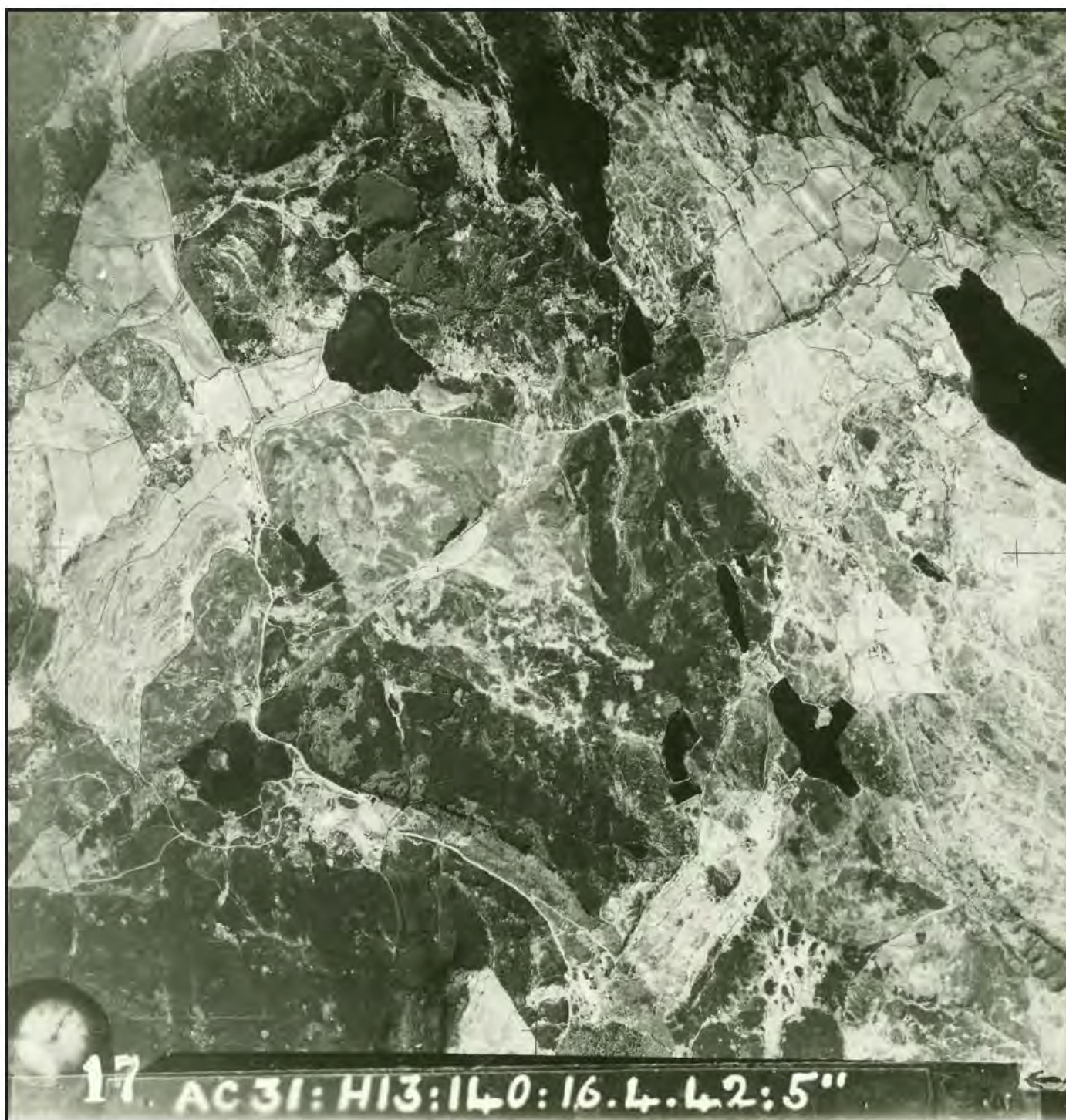


Figure 08 - Reproduction of Aerial Photograph RAF AC31:H13:140 Image 17 taken on 16th April 1942

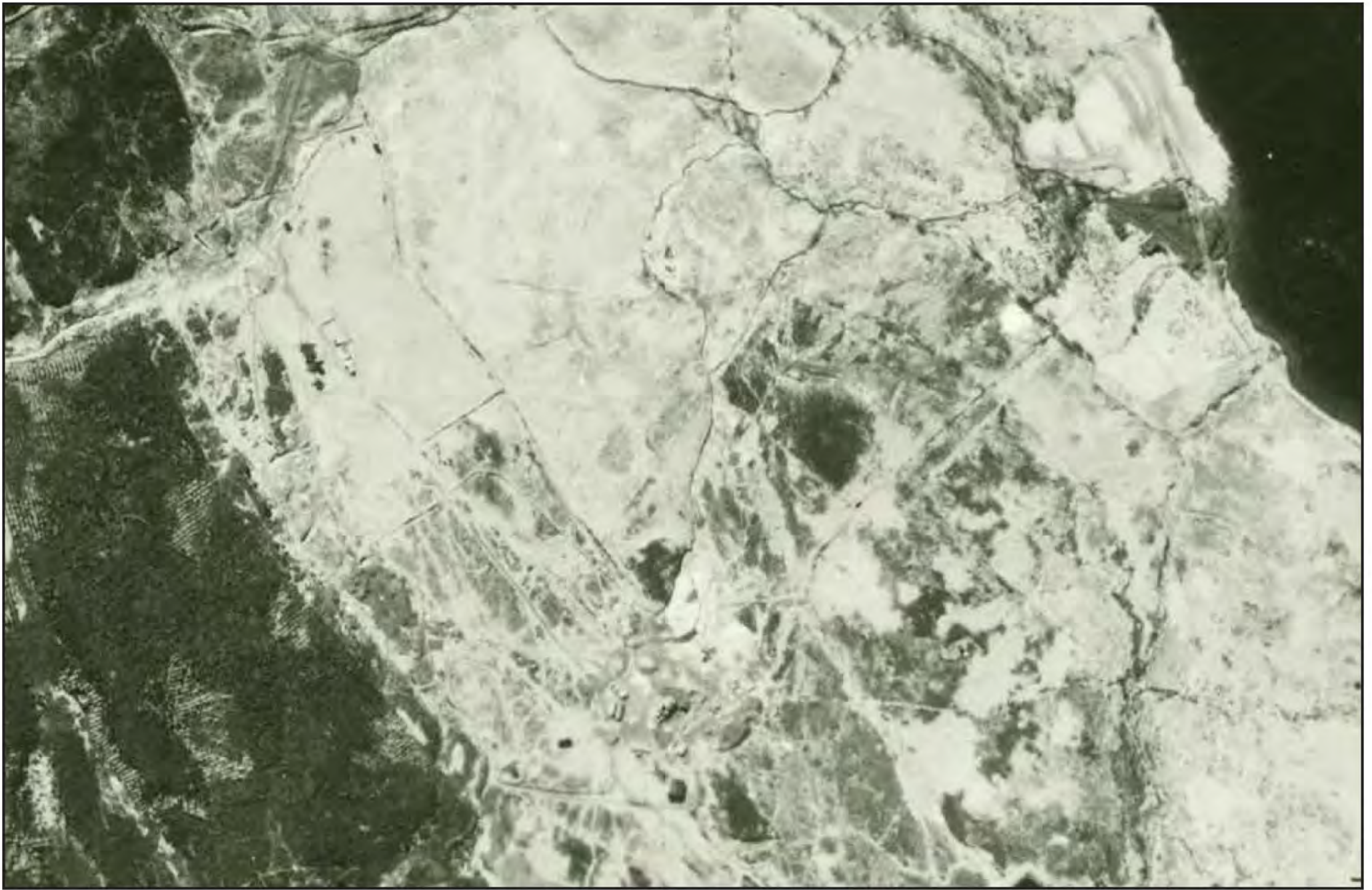


Figure 09 - Reproduction of Aerial Photograph RAF AC31:H13:140 Image 17 taken on 16th April 1942, scaled to show detail of Pandora Mine site.

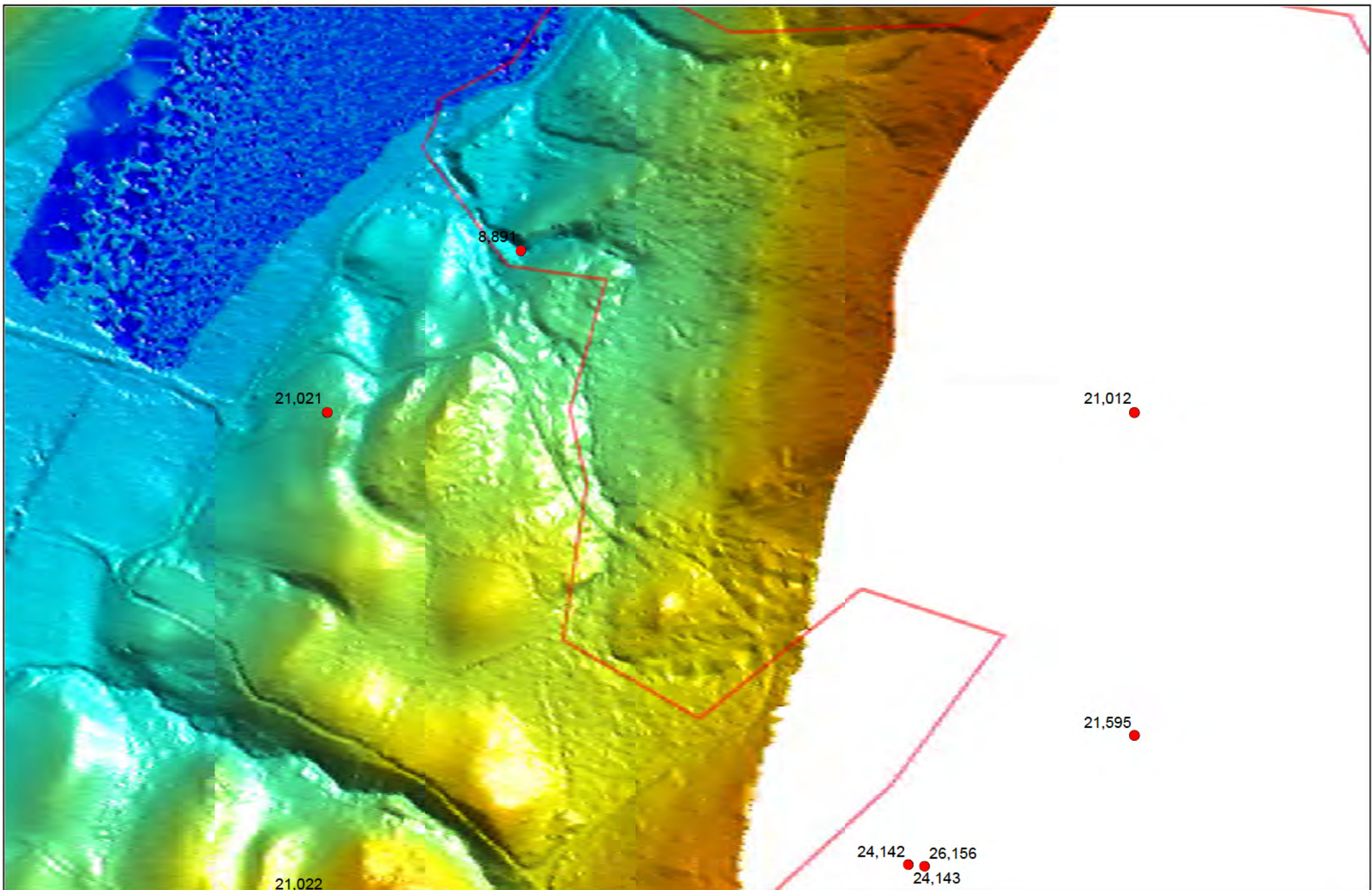


Figure 10 - Lidar Composite 1m DTM. Source Welsh Government Lle Portal

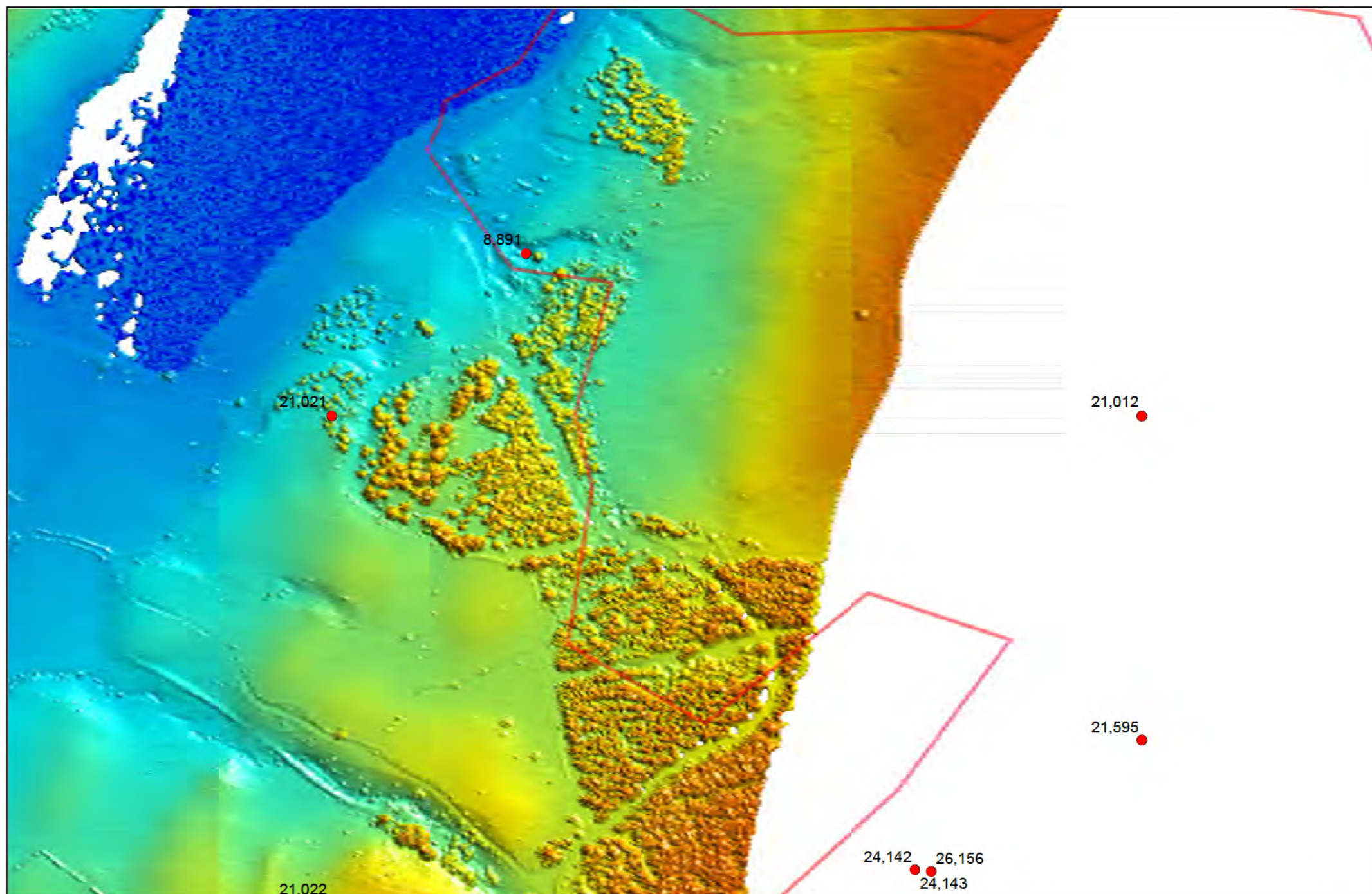


Figure 11 - Lidar Composite 1m DSM. Source Welsh Government Lle Portal

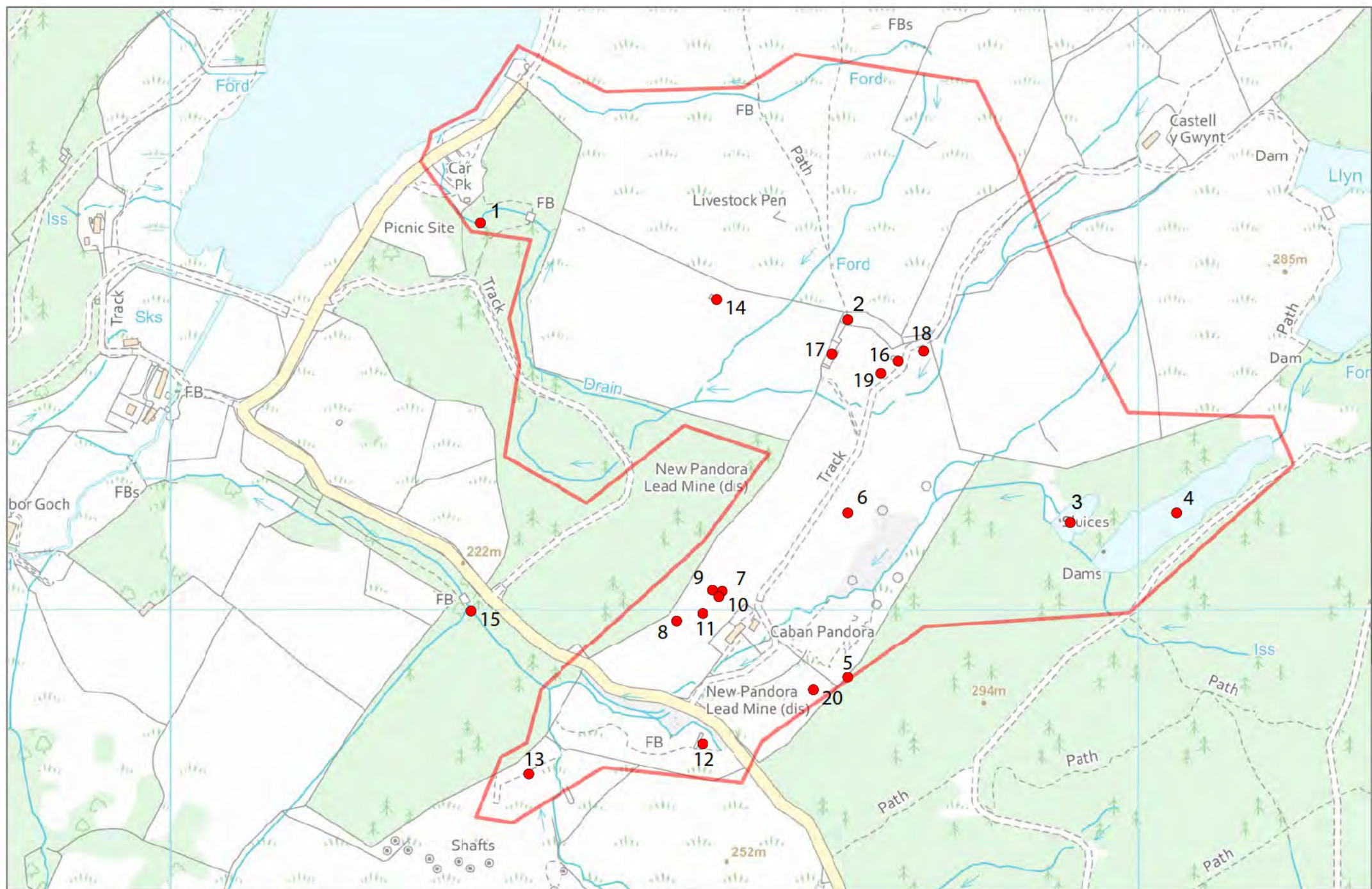


Figure 12 - Gazetteer of Features. Background mapping reproduced from Ordnance Survey VectorMap Local with the permission of H.M.S.O.
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Plate 1: Pontifex Adit; no scale; view from NW (archive reference: G2682_016).



Plate 2: Downstream towards Pontifex Adit from current flow monitoring apparatus; scale 1x1m; view from ESE (archive reference: G2682_009).



Plate 3: Current flow rate monitor - Pontifex Adit; scale 1x1m; view from SE (archive reference: G2682_007).



Plate 4: Waterwheel Pit; no scale; view from NE (archive reference: G2682_001).



Plate 5: Waterwheel Pit; no scale; view from NNE (archive reference: G2682_002).



Plate 6: Remains of old tank building - linear channel visible running down field; no scale; view from NNW (archive reference: G2682_008).



Plate 7: Embankment/Tramway; no scale; view from N (archive reference: G2682_005).



Plate 8: Tramway; scale 1x1m; view from E (archive reference: G2682_021).



Plate 9: Tramway with culvert for stream; no scale; view from NE (archive reference: G2682_017).



Plate 10: Remains of Winding house; scale 1x1m; view from W (archive reference: G2682_025).



Plate 11: Sheep pens at location of Oil flotation Mill; scale 1x1m; view from ESE (archive reference: G2682_023).



Plate 12: Ruined Building - Managers house; scale 1x1m; view from SW (archive reference: G2682_027).



Plate 13: Spoil Tip and Survey Office Remains; scale 1x1m; view from SE (archive reference: G2682_028).



Plate 14: Powder magazine; scale 1x1m; view from N (archive reference: G2682_019).

APPENDIX I

Gwynedd Archaeological Trust Written Scheme of Investigation

PANDORA MINE, TREFRIW (G2682)

WRITTEN SCHEME OF INVESTIGATION
FOR ARCHAEOLOGICAL ASSESSMENT

Prepared for

BINNIES

February 2021



Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

All GAT staff should sign their copy to confirm the project specification is read and understood and retain a copy of the specification for the duration of their involvement with the project. On completion, the specification should be retained with the project archive:

Name

Signature

Date

PANDORA MINE, TREFRIW (G2682)

WRITTEN SCHEME OF INVESTIGATION FOR AN ARCHAEOLOGICAL ASSESSMENT

Prepared for *BINNIES*, February 2021

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1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) has been commissioned by BINNIES to undertake an archaeological assessment in relation to Surface Water Management engineering interventions options appraisal at Pandora Mine, near Trefriw, CCBC (NGR SH76686054; postcode LL27 0YX; [Figure 01](#)). The Pandora Mine is located to the south east of Llyn Geirionydd, within Snowdonia National Park. As stated in Natural Resources Wales, *NPS-PS-0027-15 CE0659 Pandora - Surface water and spoil management Black & Veatch | Scope of Services Rev 1* Dated 02/10/2020, a Surface Water Management engineering options appraisal is required that fully considers the site environmental setting and heritage. These works will inform outline and detailed design of one flow monitoring structure downstream of the Pontifex Adit at Pandora Mine ((*ibid.*) [Figure 02](#)) and an assessment of the suitability of an existing structure upstream of the Pontifex Adit to collect flow monitoring data and ultimately calculate outflow from the Pontifex Adit (Pandora mine). The purposes of these works are to reduce the risk of a blow-out event at Pontifex Adit and reduce the erosion and transport of metal rich mine spoil that is produced by interaction between watercourses and mine features. Currently it is assumed that no single engineering intervention will be suitable across the area and a combination of interventions will likely be required (*ibid.*).

The archaeological assessment will consider the heritage of the site and include desk-based research and a field survey. The assessment will be undertaken during March - April 2021 and completed in accordance with the following guidance:

- *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* Version 1.1 (The Welsh Archaeological Trusts, 2018);
- *Guidelines for digital archives* (Royal Commission on Ancient and Historic Monuments of Wales, 2015);
- *Management of Archaeological Projects* (English Heritage, 1991);
- *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide* (Historic England, 2015);
- *Standard and Guidance for Desk Based Assessment* (Chartered Institute for Archaeologists, 2017);

- *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives* (Chartered Institute for Archaeologists, 2020).
- Standard and Guidance for the Archaeological Investigation and Recording of Standing Buildings or Structures (Chartered Institute for Archaeologists, 2014); and

Gwynedd Archaeological Trust is certified to ISO 9001:2015 and ISO 14001:2015 (Cert. No. 74180/B/0001/UK/En) and is a Registered Organisation with the Chartered Institute for Archaeologists.

1.1 Monitoring Arrangements

The archaeological assessment will be monitored by the Gwynedd archaeological Planning Service (GAPS); all subsequent reporting by GAT must be approved by GAPS prior to final issue. GAPS have stated that the history of the mine is relatively well-known but field evidence is limited and that the site is located just outside a comprehensive survey undertaken in 2014, which identified numerous sites in the wider area as well as the potential for further features to be identified associated with the Pandora mine. A report from 1995 (Gwynedd Archaeological Trust Report 136), from which much of the regional Historic Environment Record text for Pandora mine workings is taken, provides a comprehensive historical account and the results of a rapid field survey and transcriptions of historic maps. As this provides baseline data, GAPS have advised that rather than a full desk study, work to inform the Surface Water Management engineering interventions options should comprise an updated account of the current condition of sites from the 1995 report as well as anything that has been identified in the interim, with the likelihood that any features affected by the proposals will either need avoidance or a mitigation record (to be confirmed further to the field survey).

1.2 Aims and Objectives

The key aims and objectives are to:

- Carry out a field survey of Pandora Mine site to assess and update on the current condition of sites since the 1995 report as well as anything that has been identified in the interim;
- Prepare a report using existing and updated baseline heritage data to inform the Surface Water Management engineering interventions options and advise on proposals for avoidance or mitigation record.

1.3 Historic Environment Record

In line with the Gwynedd Historic Environment Record (HER) requirements, the HER will be contacted at the onset of the project to ensure that any data arising is formatted in a manner suitable for accession to the HER and follows the guidance set out in *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (The Welsh Archaeological Trusts, 2018). The HER will be informed of the project start date, location including grid reference, estimated timescale for the work, and further relevant information associated with the project.

The GAT HER Enquiry Number for this project is GATHER 1381 and the Event PRN is 46020. The GAT HER will also be responsible for supplying Primary Reference Numbers (PRN) for any new assets identified and recorded.

Prior to submission of data to the HER on completion of the project, a bilingual event summary document will be prepared in *Microsoft Word* based on the format defined in section 4.2 of *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (Version 1.1).

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

The Pandora Mine during its history has been known by many names, as Foel Ddu, Willoughby, Pandora, Welsh Foxdale and the Eagle. In its infancy, the site began as a lead mine later to become a zinc mine towards the end of the 19th century. The site has a documented history since the 1840s and stopped being operational in the 1920s. Currently, many of the features present on site surround the main shaft (Pyne's Shaft) and date from the 19th century, whilst other features, such as tramways, reservoirs and least, found adjacent to Llyn Geirionydd, date from 1878 to 1880. The Pontifex Adit (PRN 8891) which was completed in 1907 can be seen in the 1913 Third Edition 25-inch to 1-mile Ordnance Survey Caernarvonshire County Series Map Sheet XVIII.8 (Figure 05) (SWM Scope, pages 1 and 2)

More recently, works have been done to protect the site, with the erection of a fence to the South of Caban Pandora and the minor road, and around the spoil tips. There has also been the implementation of minor drainage work at the dressing floor, as well as felling of the Western Hemlock over the Pontifex Adit portal to the West and the addition of an access track to the Pandora reservoirs to the north east (Ibid.).

Known archaeological assets associated with Pandora Mine site include:

PRN	Name	Type	Location (NGR)
8891	Pandora, Pontifex Level	Mine	SH7632060400
9037	Pandora Reservoir II	Mine	SH7693360097
9038	Pandora Reservoir I	Mine	SH7705060115
9039	Pandora Shaft	Mine	SH7670659933
21021	Level, Tal Y Llyn	Mine	SH7620060300

Examining the First to Third Edition 25-inch to 1-mile Ordnance Survey Caernarvonshire County Series Map Sheets XVIII.8 (published 1889, 1900 and 1913 respectively; cf. Figures [03](#), [04](#) and [05](#)) shows the development of the mine infrastructure within that timeframe. On the First Edition map, the mine is listed as Willoughby Lead Mine, visible as a compilation of a shaft, tramway, buildings and two reservoirs and associated sluices. On the Second Edition Map, published eleven years later, it is now referred to as Welsh Foxdale Lead Mine and the visible infrastructure is less extensive with the disuse of the tramway and overall limited

development. The Third Edition map reveals yet again a change in the name of the mine, referred to as the New Pandora Lead Mine which sees to the revival of the mine infrastructure consisting of a new Level east of Llyn Geirionydd referred to as the Pontifex Adit and associated shafts, buildings, an aqueduct and a new more extensive tramway.

3 METHODOLOGY

3.1 Introduction

Gwynedd Archaeological Trust will undertake an archaeological assessment at the former Pandora Mine site, near Trefriw ahead of the construction of a flow monitoring structure downstream of the Pontifex Adit (Pandora Mine). This assessment will involve a desk-based study incorporating a walkover survey and a heritage asset gazetteer that will comprise an updated account of the current condition of sites previously identified for the purpose of assessing whether any archaeological assets affected by the proposals will require avoidance and/or mitigation record. The assessment will be undertaken during March - April 2021.

3.2 Assessment (Desktop Study)

A desk-based assessment is defined as “a programme of study of the historic environment within a specified area or site on land, the inter-tidal zone or underwater that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage....Significance is to be judged in a local, regional, national or international context as appropriate” (ClfA 2017, 4).

The desk-based assessment will involve a study of the following resources:

1. The regional Historic Environment Register ((HER) Gwynedd Archaeological Trust, Craig Beuno, Ffordd y Garth, Bangor, Gwynedd LL57 2RT) will be examined for information concerning the study area, defined as Pandora Mine, (PRN 20447) as located in Figure 01. Examination of HER data will be undertaken, including the 6-inch and 25-inch County Series Ordnance Survey maps and any secondary information held within the HER, including:
 - Dutton, L.A., Roberts, R.M. & Vernon, R.W. 1995 *Gwydyr Mines Archaeological Assessment*. Report No. 136;
 - Bennett, J. & Vernon, R., 1995, *Mines of the Gwydyr Forest Part 6*;
 - Gwyn, D., 1998, *Gwynedd Metal Mines Survey*. Report 291; and
 - Thomas, D., 1998, *Gwydyr Archaeological Assessment*. Report No. 284.

All identified features will be mapped, described and added to a gazetteer of sites and the relative importance of any sites defined;

3.3 Field Survey

A field survey will be undertaken that will incorporate the assessment study area, as outlined in red in Figure 02. The aim will be to visit and record known features within the proposed site for the installation of the downstream flow monitoring structure. The features will be mapped and located in advance as part of the desk based assessment, using a combination of historic and GIS based data; this information will then be used to geo-locate features, which will then be located and described on GAT pro-formas. The sites will then be added to the overall gazetteer and their relative importance defined. Any newly identified assets will also be recorded. Only features that can be safely accessed will be directly recorded. A handheld GPS unit will also be used during the walkover survey. A photographic record will be maintained in RAW format using a digital SLR set to maximum resolution (Nikon D3100; resolution: 4,608 × 3,072 (14.2 effective megapixels)) and photographic metadata table will be completed and included in the report. Photographic images will be archived in TIFF format; a dedicated archive numbering system will be used. Photographic images will be taken using the on-board digital camera set to a resolution of 5472 x 3648 (19 megapixels) in JPEG format; a photographic record will be digitised in *Microsoft Excel* as part of the archive and dissemination process. Photographic images will be archived in TIFF format using Adobe Photoshop; the archive numbering system will start from G2682_001.

All data will be processed and a report will be produced which will detail and synthesise the results.

3.4 Gazetteer of Features

A gazetteer will be compiled for any existing and newly identified sites, based on information sourced from the desk based assessment and field survey and will include information for the preceding survey completed in 1995 and will incorporate the assets listed in [para. 2](#); the gazetteer will be presented in the following format:

Feature Number	
Site name	
PRN number	
Grid reference	
Period	
Site type	
Assessment category	
Description	
Impact	
Recommendation for further assessment/evaluation	
Recommendation for mitigatory measures	

The following categories will be used to define the assessment category of the archaeological asset:

Category A - Sites of National Importance.

Scheduled Monuments, Listed Buildings of grade II* and above, as well as those that would meet the requirements for scheduling (ancient monuments) or listing (buildings) or both. Sites that are scheduled or listed have legal protection, and it is recommended that all Category A sites remain preserved and protected *in situ*.

Category B - Sites of regional or county importance.

Grade II listed buildings and sites which would not fulfil the criteria for scheduling or listing, but which are nevertheless of particular importance within the region. Preservation *in situ* is the preferred option for Category B sites, but if damage or

destruction cannot be avoided, appropriate detailed recording might be an acceptable alternative.

Category C - Sites of district or local importance.

Sites which are not of sufficient importance to justify a recommendation for preservation if threatened. Category C sites nevertheless merit adequate recording in advance of damage or destruction.

Category D - Minor and damaged sites.

Sites that are of minor importance or are so badly damaged that too little remains to justify their inclusion in a higher category. For Category D sites, rapid recording, either in advance of or during destruction, should be sufficient.

Category E - Sites needing further investigation.

Sites, the importance of which is as yet undetermined and which will require further work before they can be allocated to categories A - D are temporarily placed in this category, with specific recommendations for further evaluation.

The impact of the proposed works on any asset will be identified using the following impact criteria, defined either as *none, slight, unlikely, likely, significant, considerable or unknown* as follows:

None:

There is no construction impact on this asset.

Slight:

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

Unlikely:

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

Likely:

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

Significant:

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

Considerable:

The total removal of an asset or its partial removal which would effectively destroy the remainder of the site.

Unknown:

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

3.5 Working Project Archive

Following the completion of the fieldwork, a programme of fieldwork archiving will be completed based on following task list;

1. Pro-formas: all cross referenced and complete;
2. Sections: all cross referenced and complete;
3. Survey data: downloaded using a Computer Aided Design package;
4. Plans: all cross referenced and complete;

All data will be processed, final illustrations will be compiled and a report will be produced which will detail and synthesise the results.

3.6 Data Management Plan

Data Management will be completed based on following task list;

1. Pro-formas: all cross referenced and scanned for digital archiving;
2. Photographic Metadata: cross-referenced with all pro-formas and completed in *Microsoft Excel*;

This data will then be used as the basis for the physical and digital dataset archives. Information from these will be used to compile the project report. The physical archive will be stored in a designated project folder and the location confirmed in the Trust project database; the digital dataset will be stored on a dedicated Trust server, with the location confirmed in the Trust project database via a specific hyperlink. External datasets for the HER and RCAHMW are as defined in the dissemination strategy below. De-selected digital data will be confirmed in an updated digital management plan appended to the final report.

A draft report will be submitted within one month of fieldwork completion and a final report will be submitted to the regional Historic Environment Record within six months of project completion. The report will include the following:

1. Non-technical summary (Welsh and English)
2. Introduction
3. Background
4. Methodology
5. Results
6. Conclusion
7. List of sources consulted.
8. Appendix I – approved GAT project specification
9. Appendix II – photographic metadata

On final approval, the following dissemination and archiving of the report and digital dataset will apply:

- A digital report(s) will be provided to the client and GAPS (draft report then final report);
- A digital report will be provided to the regional Historic Environment Record; this will be submitted within six months of project completion (final report only), along with a

digital dataset comprising an Event PRN summary. The report and dataset will be submitted in accordance with the required standards set out in *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (Version 1.1); and

- A digital report and digital archive dataset will be provided to Royal Commission on Ancient and Historic Monuments, Wales (final report only), in accordance with the *RCAHMW Guidelines for Digital Archives Version 1*. The dataset will be prepared in the format required by RCAHMW and will include:
 - Photographic metadata (Microsoft Access);
 - Photographic archive (TIFF format);
 - Project Information form (Excel);
 - File Information form (Excel) – Microsoft Word report text final;
 - File Information form (Excel) – Photographic metadata (general);
 - File Information form (Excel) – Adobe PDF report final; and
 - File Information form (Excel) - Photographic metadata (detail).

4 PERSONNEL

The project will be managed by John Roberts, Principal Archaeologist GAT Contracts Section and undertaken by a team of project archaeologists. The project archaeologists will be responsible for the desk based assessment and field survey, as well as Gwynedd Archaeological Planning Service liaison and client liaison. The project archaeologists will be responsible for completing the field survey pro-formas and the archive itemised. The project archaeologists will also be responsible for submitting a draft final report to the project manager for review and approval. The reports will then be submitted as per the arrangements defined above.

5 HEALTH AND SAFETY

The GAT Project Archaeologist(s) will be CSCS certified. Copies of the site specific risk assessment will be supplied to the client prior to the start of the field survey. All GAT staff attending will be issued with required personal safety equipment, including high visibility jacket, steel toe-capped boots and hard hat.

Due to the location and terrain, specific allowance will need to be made and appropriate control measures applied, including for the following:

- Access on foot only, with likely overgrowth and uneven terrain;
- Intermittent phone signal; and
- Adverse weather.

6 SOCIAL MEDIA

One of the key aims in the GAT mission statement is to improve the understanding, conservation and promotion of the historic environment in our area and inform and educate the wider public. To help achieve this, GAT maintains an active social media presence and seeks all opportunities to promote our projects and results. With permission, GAT would like the opportunity to promote our work on this scheme through our social media platforms. This could include social media postings during our attendance on site as well as any postings to highlight results. In all instances, approval will be sought from client prior to any postings.

7 INSURANCE

7.1 Public/Products Liability

Limit of Indemnity- £5,000,000 any one event in respect of Public Liability

INSURER Aviva Insurance Limited

POLICY TYPE Public Liability

POLICY NUMBER 24765101CHC/UN/000375

EXPIRY DATE 21/06/2021

7.2 Employers Liability

Limit of Indemnity- £10,000,000 any one occurrence.

The cover has been issued on the insurers standard policy form and is subject to their usual terms and conditions. A copy of the policy wording is available on request.

INSURER Aviva Insurance Limited

POLICY TYPE Employers Liability

POLICY NUMBER 24765101 CHC / UN/000375

EXPIRY DATE 21/06/2021

7.3 Professional Indemnity

Limit of Indemnity- £5,000,000 in respect of each and every claim

INSURER Hiscox Insurance Company Limited

POLICY TYPE Professional Indemnity

EXPIRY DATE 22/07/2021

8 SOURCES CONSULTED

1. Bennett, J. & Vernon, R., 1995 , Mines of the Gwydyr Forest Part 6
2. Chartered Institute for Archaeologists, 2014, *Standard and Guidance for Desk Based Assessment*
3. Chartered Institute for Archaeologists, 2014, *Standard and guidance for the collection, documentation, conservation and research of archaeological materials*
4. Chartered Institute for Archaeologists, 2020, *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives*
5. Chartered Institute for Archaeologists, 2014, *Standard and Guidance for the Archaeological Investigation and Recording of Standing Buildings or Structures*
6. Dutton, L.A., Roberts, R.M. & Vernon, R.W. 1995. *Gwydyr Mines Archaeological Assessment*
7. English Heritage, 1991, *Management of Archaeological Projects (MAP2)*
8. *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* Version 1.1 (The Welsh Archaeological Trusts, 2018);
9. *Guidelines for digital archives* (Royal Commission on Ancient and Historic Monuments of Wales, 2015);
10. Gwyn, D., 1998 , Gwynedd Metal Mines Survey. Report 291
11. Historic England, 2015, *Management of Research Projects in the Historic Environment (MoRPHE)*
12. Natural Resources Wales, NPS-PS-0027-15 CE0659 Pandora - Surface water and spoil management BINNIES | Scope of Services Rev 1 Dated 02/10/2020
13. Royal Commission on Ancient and Historic Monuments of Wales, 2015, *Guidelines for digital archives*
14. The Welsh Archaeological Trusts, 2018, *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)*
15. Thomas, D., 1998, *Gwydyr Archaeological Assessment*. Report No. 284

FIGURE 01

**Site Location © Crown Copyright and database rights Ordnance Survey.
Natural Resources Wales, 100019741, 2015. Source: Binnies.**



Legend

Notes

Pandora Site



0.5 0 0.25 0.5 Kilometers

British_National_Grid

© Crown Copyright and database rights Ordnance Survey Natural Resources Wales, 100019741, 2015. © Haelffairty y Goron a haelffairty ddata Arddig Ordnance Cyfoeth Naturiol Cymru, 100019741, 2015. This map is a user generated static output from an internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

FIGURE 02

Pontifex Adit outflow, Llyn Geirionydd car park/day-use area and anticipated flow monitoring locations. Source: Binnies.



Legend

-  Public toilets
-  Shallow water zone
- frequented by bathers
-  Picnic area
-  Foreshore carpark with
make shift boat ramp
-  Mine water flow path



Picnic Area

Car Park

FB

Pontefex Adit

Path

Site: Llyn Geirionydd - Picnic Area
 Mine Hazard Considerations
 Project: BOP1 & SWI1
 Project No.: EV00398
 Drawn: EH

Date: 08/04/2020

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 Ordnance Survey Licence number: 100020315

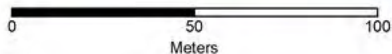
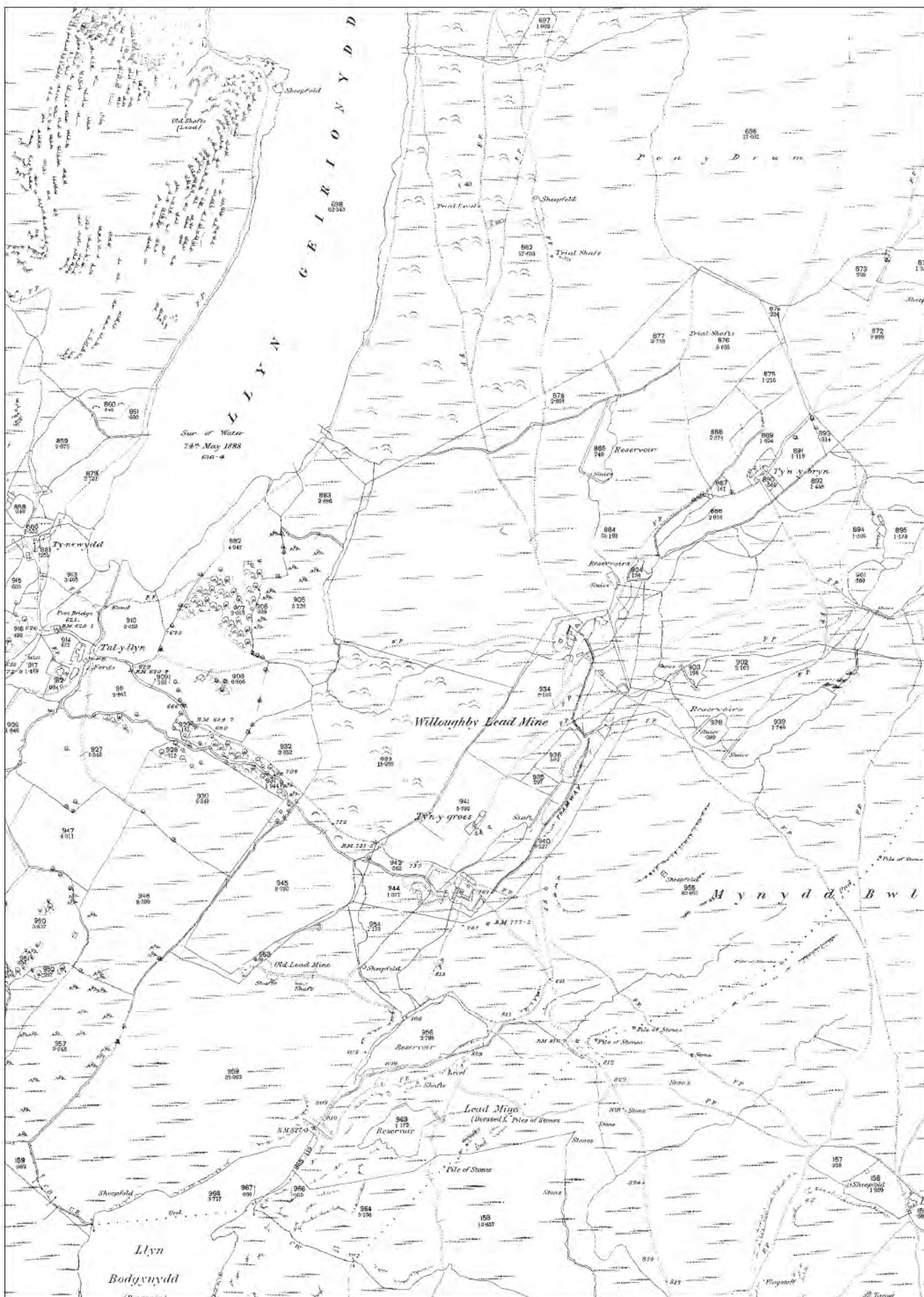


FIGURE 03

**Reproduction of Ordnance Survey First Edition 25-inch to 1-mile
Caernarvonshire County Series Map Sheets XVIII.8, published 1889.
Scale 1:7500@ A4.**



Reproduction of Ordnance Survey First Edition 25-inch to 1-mile Caernarvonshire County Series Map Sheets XVIII.8, published 1889. Scale 1:7500@ A4.

FIGURE 04

**Reproduction of Ordnance Survey First Edition 25-inch to 1-mile
Caernarvonshire County Series Map Sheets XVIII.8, published 1900.
Scale 1:7500@ A4.**



FIGURE 05

**Reproduction of Ordnance Survey First Edition 25-inch to 1-mile
Caernarvonshire County Series Map Sheets XVIII.8, published 1913.
Scale 1:7500@ A4.**

APPENDIX I

Gwynedd Archaeological Trust basic recording pro-forma

YMDDIRIEDOLAETH ARCHAEOLEGOL GWYNEDD ARCHAEOLOGICAL TRUST		
BASIC RECORDING FORM	Project name	Project number
Feature name		Feature Number
NGR		
Description		
<div></div>		
Recommendations for further assessment		
<div></div>		
Photographic record numbers		
Digital		
	Visit date	Visit by

APPENDIX II

Gwynedd Archaeological Trust photographic metadata pro-forma



Digital Photographic Record

Include main context numbers for each shot, drawing numbers for sections and any other relevant numbers for cross referencing.

Delete any unwanted photos **immediately** from the camera.

Regularly upload photographs to computer.

[illegible]

APPENDIX II

Definition of Mitigation Terms

Definition of field evaluation techniques

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

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

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

Definition of Mitigatory Recommendations

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

None:

No impact so no requirement for mitigatory measures.

Detailed recording:

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

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

Basic recording:

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

Strip, Map and Sample:

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

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

Watching brief:

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

Avoidance:

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

Reinstatement:

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

APPENDIX III

Gwynedd Archaeological Trust Photographic Metadata

PHOTO RECORD NUMBER*	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	PLATE
G2682_001	G2682_Pandora_Mine	Waterwheel Pit	NE	-	Carol Ryan Young	15/03/2021	4
G2682_002	G2682_Pandora_Mine	Waterwheel Pit	NNE	-	Carol Ryan Young	15/03/2021	5
G2682_003	G2682_Pandora_Mine	Recent Disturbance ?	N	-	Carol Ryan Young	15/03/2021	
G2682_004	G2682_Pandora_Mine	Embankment/Tramway	NE	-	Carol Ryan Young	15/03/2021	
G2682_005	G2682_Pandora_Mine	Embankment/Tramway	N	-	Carol Ryan Young	15/03/2021	7
G2682_006	G2682_Pandora_Mine	Current flow rate monitor - Pontifex Adit	NW	1x1m	Carol Ryan Young	15/03/2021	Cover
G2682_007	G2682_Pandora_Mine	Current flow rate monitor - Pontifex Adit	SE	1x1m	Carol Ryan Young	15/03/2021	3
G2682_008	G2682_Pandora_Mine	Remains of old tank building - linear channel visible running down field	NNW	-	Carol Ryan Young	15/03/2021	6
G2682_009	G2682_Pandora_Mine	Downstream - Pontifex Adit	ESE	1x1m	Carol Ryan Young	15/03/2021	2

PHOTO RECORD NUMBER*	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	PLATE
G2682_010	G2682_Pandora_Mine	View over lake to Klondike Mill	SW	-	Carol Ryan Young	15/03/2021	
G2682_011	G2682_Pandora_Mine	Water from Pontifex Adit into car park	NW	1x1m	Carol Ryan Young	15/03/2021	
G2682_012	G2682_Pandora_Mine	Old channel running through forest	NW	1x1m	Carol Ryan Young	15/03/2021	
G2682_013	G2682_Pandora_Mine	Old channel (lower) running adjacent to adit	NW	1x1m	Carol Ryan Young	15/03/2021	
G2682_014	G2682_Pandora_Mine	Old channel (lower) running adjacent to adit	SE	-	Carol Ryan Young	15/03/2021	
G2682_015	G2682_Pandora_Mine	Pontifex Adit	NW	-	Carol Ryan Young	15/03/2021	
G2682_016	G2682_Pandora_Mine	Pontifex Adit	NW	-	Carol Ryan Young	15/03/2021	1
G2682_017	G2682_Pandora_Mine	Tramway with culvert for stream	NE	-	Carol Ryan Young	15/03/2021	9
G2682_018	G2682_Pandora_Mine	Tramway with culvert for stream	SE	-	Carol Ryan Young	15/03/2021	

PHOTO RECORD NUMBER*	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	PLATE
G2682_019	G2682_Pandora_Mine	Powder magazine	N	1x1m	Carol Ryan Young	15/03/2021	14
G2682_020	G2682_Pandora_Mine	Powder magazine	NNW	1x1m	Carol Ryan Young	15/03/2021	
G2682_021	G2682_Pandora_Mine	Tramway ?	E	1x1m	Carol Ryan Young	15/03/2021	8
G2682_022	G2682_Pandora_Mine	Tank Building Remains	SE	-	Carol Ryan Young	15/03/2021	
G2682_023	G2682_Pandora_Mine	Sheep pens	ESE	-	Carol Ryan Young	15/03/2021	11
G2682_024	G2682_Pandora_Mine	Spoil tip	N	1x1m	Carol Ryan Young	15/03/2021	
G2682_025	G2682_Pandora_Mine	Ruined Buildings	W	1x1m	Carol Ryan Young	15/03/2021	10
G2682_026	G2682_Pandora_Mine	Ruined Concrete Structures	ESE	-	Carol Ryan Young	15/03/2021	
G2682_027	G2682_Pandora_Mine	Runied Building	SW	1x1m	Carol Ryan Young	15/03/2021	12

PHOTO RECORD NUMBER*	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	PLATE
G2682_028	G2682_Pandora_Mine	Spoil Tip and Building	SE	-	Carol Ryan Young	15/03/2021	13
G2682_029	G2682_Pandora_Mine	Mine workings and tips	NNW	-	Carol Ryan Young	15/03/2021	
G2682_030	G2682_Pandora_Mine	Mine workings and tips	NW	-	Carol Ryan Young	15/03/2021	
G2682_031	G2682_Pandora_Mine	Mine workings and tips	WNW	-	Carol Ryan Young	15/03/2021	
G2682_032	G2682_Pandora_Mine	Mine workings	WNW	-	Carol Ryan Young	15/03/2021	

APPENDIX IV

Gwynedd Archaeological Trust Selection Strategy

G2682_Pandora_Mine

22/03/2021 v1.0

Selection Strategy

Project Information

Project Management

Project Manager	John Roberts john.roberts@heneb.co.uk
Archaeological Archive Manager	John Roberts john.roberts@heneb.co.uk
Organisation	Gwynedd Archaeological Trust

Stakeholders		Date Contacted
Collecting Institution(s)	RCAHMW	Not yet contacted
Project Lead / Project Assurance	Tom Fildes, Gwynedd Archaeological Planning Services	17/02/2021
Landowner / Developer	National Resources Wales	Through Client
Other: Client	BINNIES	02/12/2020

Resources

Resources required

Describe the resources required to implement this Selection Strategy, particularly if unusual resources are required.

No unusual resources required outside of GAT normal operating equipment and personnel.

Context

Describe below the context of this Selection Strategy. You should refer to:

- The aims and objectives of the project;
- Local Authority guidance (including the brief);
- Research Frameworks;
- The repository collection development policy and/or deposition policy;
- Material-specific guidance documents.

Note: This section may be copied from your Project Design/WSI to ensure all Stakeholders receive this context information.

The full aims and objectives are detailed in the project specific written scheme of investigation (GAT Report 1580 Appendix I).

Gwynedd Archaeological Trust (GAT) has been commissioned by BINNIES to undertake an archaeological assessment in relation to Surface Water Management engineering interventions options appraisal at Pandora Mine, near Trefriw. The evaluation conforms to the following guidelines:

- *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs) Version 1.1* (The Welsh Archaeological Trusts, 2018);
- *Guidelines for digital archives* (Royal Commission on Ancient and Historic Monuments of Wales, 2015);
- *Management of Archaeological Projects* (English Heritage, 1991);
- *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide* (Historic England, 2015);
- *Standard and Guidance for Desk Based Assessment* (Chartered Institute for Archaeologists, 2017);
- *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives* (Chartered Institute for Archaeologists, 2020).
- *Standard and Guidance for the Archaeological Investigation and Recording of Standing Buildings or Structures* (Chartered Institute for Archaeologists, 2014)

1 – Digital Data

Stakeholders

Name the individual(s) responsible for the Digital Data Selection decisions (i.e. Archaeological Archive Manager, Project Manager, Collections Curator).

John Roberts (Gwynedd Archaeological Trust Project Manager)

Carol Ryan Young (Gwynedd Archaeological Trust Project Archaeologist)

Selection

Location of Data Management Plan (DMP)

Selection of digital data elements should be considered in your project's DMP. For the purpose of the Selection Strategy, you can either copy the selection section of your DMP below, or attach it as an appendix to this document. Please indicate here if the DMP is attached.

P:\Project Database

The selection strategy in your DMP should:

- 1.1 Define what digital data will be selected for inclusion in the archaeological archive, how this will be done, and why. Do not forget to consider that specialists may have digital data that should be included in the archaeological archive.
- 1.2 Identify the selection review points during the project (i.e. project planning, data gathering, analysis and reporting and archive compilation).
- 1.3 Reference all relevant standards, policies or guidelines (e.g. digital repository deposition requirements) and specialist advice sought.
- 1.4 Identify any selection decisions that differ from standard guidelines and explain why.

This working project archive data will be processed as follows:

1. Pro-formas: all cross referenced and scanned for digital archiving;
2. Photographic Metadata: cross-referenced with all pro-formas and completed in Microsoft Excel;

Information from these will be used to compile the project report. The physical archive will be stored in a designated project folder and the location confirmed in the Data Management Plan; the digital dataset will be stored on a dedicated Trust server, with the location confirmed in the Data Management Plan via a specific hyperlink. External datasets for the HER and RCAHMW are as defined in the dissemination strategy below.

- A digital report will be provided to the client and GAPS (draft report then final report);
- A digital report will be provided to the regional Historic Environment Record; this will be submitted within six months of project completion (final report only), along with a digital dataset comprising an Event PRN summary. The report and dataset will be submitted in accordance with the required standards set out in Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs) (Version 1.1); and
- A digital report and digital archive dataset will be provided to Royal Commission on Ancient and Historic Monuments, Wales (final report only), in accordance with the RCAHMW Guidelines for Digital Archives Version 1. The dataset will be prepared in the format required by RCAHMW and will include:
 - Photographic metadata (Microsoft Access);
 - Photographic archive (TIFF format);
 - Project Information form (Excel);
 - File Information form (Excel) – Microsoft Word report text final;
 - File Information form (Excel) – Photographic metadata (general);
 - File Information form (Excel) – Adobe PDF report final; and
 - File Information form (Excel) - Photographic metadata (detail).

De-Selected Digital Data

The procedure for dealing with De-selected digital data and what specialist advice informed this process should be recorded in your DMP. Please copy this information here or attach your DMP as an appendix to this document.

None

Amendments

Detail any amendments to the above selection strategy here.

Date	Amendment	Rationale	Stakeholders

2 – Documents

Stakeholders

Name the individual(s) responsible for the Documents Selection decisions (i.e. Archaeological Archive Manager, Project Manager, Repository Representative).

John Roberts (Gwynedd Archaeological Trust Project Manager)

Carol Ryan Young (Gwynedd Archaeological Trust Project Archaeologist)

Selection

Describe your Selection Strategy for the Documents elements of the archaeological archive. To do this you must:

- 2.1 Define which documents will be selected for inclusion in the archaeological archive, how this will be done, and why. Do not forget to consider that specialists may have documents that should be included in the archaeological archive.
- 2.2 Identify the selection review points during the project (e.g. project planning, data gathering, analysis and reporting and archive compilation).
- 2.3 Reference all relevant standards, policies or guidelines (e.g. digital repository deposition requirements) and specialist advice sought.
- 2.4 Identify any selection decisions that differ from standard guidelines and explain why.

This working project archive data will be processed as follows:

1. Pro-formas: all cross referenced and scanned for digital archiving. Physical pro-formas to then be stored at GAT in a dedicated project folder. Location confirmed in project database on a dedicated Trust server;

De-Selected Documents

Describe the procedure for dealing with De-selected material and what specialist advice has informed this procedure.

N/A – no deselected documents

Amendments

Detail any amendments to the above selection strategy here.

Date	Amendment	Rationale	Stakeholders



Gwynedd Archaeological Trust
Ymddiriedolaeth Archaeolegol Gwynedd

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