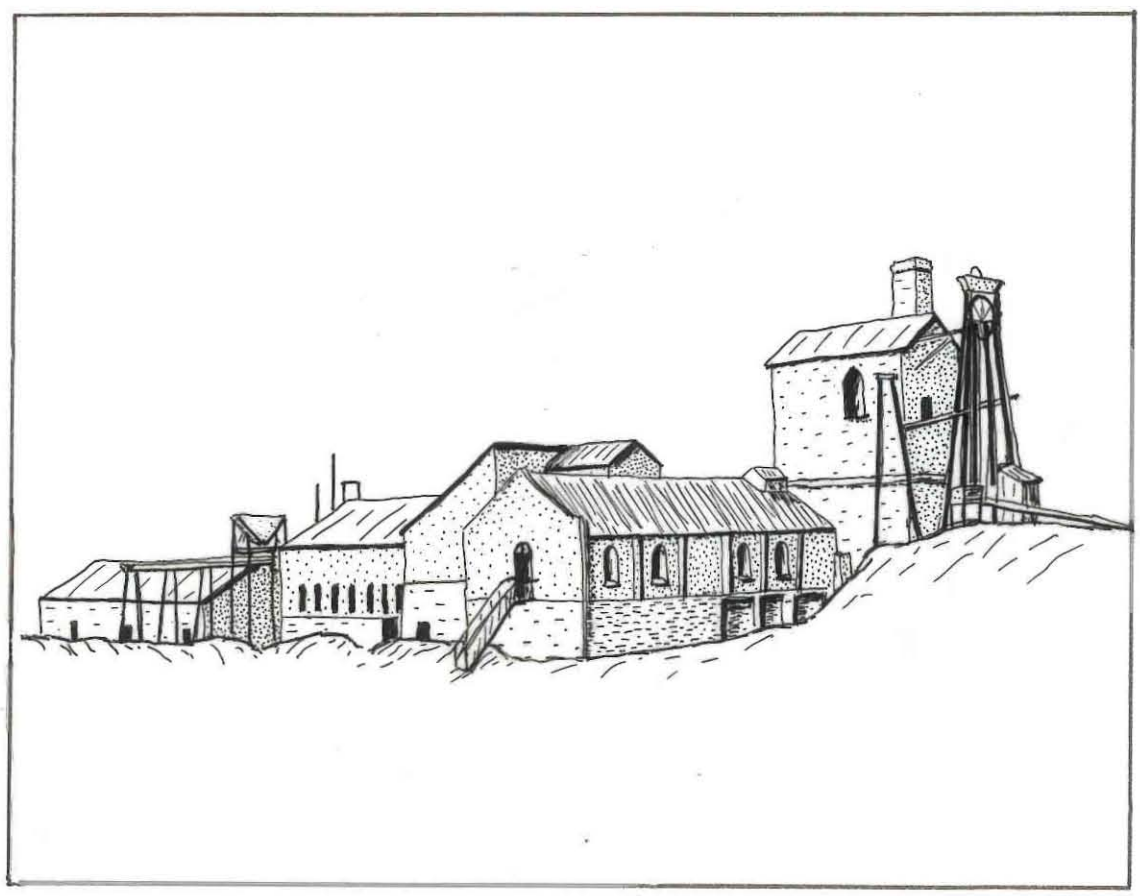
THE CLWYD-POWYS ARCHAEOLOGICAL TRUST

Lower Trelogan Lead Mine, Clwyd

ARCHAEOLOGICAL EVALUATION



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CPAT Report No158

Lower Trelogan Lead Mine, Clwyd

ARCHAEOLOGICAL EVALUATION

by David Thomas and Pat Frost

November 1995

Report prepared for Delyn Borough Council

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SUMMARY

The Contracting section of the Clwyd-Powys Archaeological Trust has undertaken an evaluation at the site of the Lower Trelogan Lead Mine, Trelogan, Clwyd. A combination of desk-top study, walkover survey and excavation has revealed that there are significant industrial remains surviving on the site. These include the winding engine house, the reservoir and later dressing area which date from the 1860s.

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1 INTRODUCTION

1.1 In June 1995 the Contracting Section of the Clwyd-Powys Archaeological Trust (hereafter CPAT) was invited by Parkman Environment, acting on behalf of Delyn Borough Council, to prepare a specification and tender for the pre-determination evaluation stage of an archaeological investigation at the former site of the Lower Trelogan lead mine, Trelogan, Clwyd. A planning application for a reclamation scheme for the site is currently under consideration by Delyn Borough Council (Delyn Borough Council Full Planning Application 0166/94).

1.2 The archaeological investigation was requested by Delyn Borough Council on the advice of the Curatorial Section of CPAT acting in their role as archaeological consultants to the Council. A brief for the investigation prepared by the Curatorial Section of CPAT (CPAT SAI 80) recognised the archaeological sensitivity of the area and proposed a three stage response, the first of which, the pre-determination evaluation, is the subject of this report.

1.3 The brief specified that the evaluation should consist of desk-top assessment, rapid fieldwalked survey and trial excavations. The results of the evaluation are to be used to inform the curator of the appropriate response in Stage 2 of the investigation. After consultation with the curator the specification was revised and was accepted, along with the quotation, by Delyn Borough Council. Work commenced on the desk-top assessment on September 25th 1995, followed by the fieldwalked survey and excavations which began on October 2nd and ran concurrently.

2 GEOGRAPHICAL BACKGROUND (Fig. 1)

2.1 The proposed development is located to the north-east of Trelogan village, on land north of Perth-y-maen Farm (SJ12508070), *c.* 3km inland from the Dee Estuary at Mostyn Banks to the east and *c.* 6.5km from Dyserth and Meliden, to the west. The economic development of the village has been a combination of mineral extraction and agriculture.

2.2 The site, known as "Lower Trelogan Mine", occupies 4.5ha, presently consisting mostly of large tips of processing waste, resulting from lead mining activity. Several substantial structures are buried beneath the waste. Former mine buildings at the entrance to the site have been converted to a modern dwelling and further buildings were used until recently as workshops.

2.3 Trelogan Mines were one of several large setts working the north-eastern edge of the Carboniferous Limestone belt, which lies east of the Vale of Clwyd and the Clwydian Hills and contains the rich veins of lead, silver and zinc, that stretch from Prestatyn (Talargoch Mines) in the north to the Bala Fault and Minera Mines in the south. The main Trelogan Vein runs south-west to north-east in "Aberdo" Limestone (Smith 1921, 46) cutting through Cherts and Coal Measure shales, which dip eastwards to the Dee Estuary. The main vein is accompanied by several ore-bearing strings. Galena (lead ore) was found along with sphalerite (zinc ore), with calcite being the gangue mineral.

3 DESK-TOP ASSESSMENT

3.1 Introduction

3.1.1. The area around Trelogan was one of the principle lead mining areas in North Flintshire from the late seventeenth century until the closure of the Hannah Shaft site in 1911. As a result there is a great deal of documentary evidence relating to the history of the mines but before the mid-nineteenth century the focus of activity was further to the south-west, closer to the modern village of Trelogan.

3.1.2 The principle aim of this desk-top assessment is to predict the position of surviving buildings within the reclamation area, but a history of mining in the Trelogan area is included to illustrate the background and importance of the Hannah Shaft site to the general history of leadmining in North-Wales.

3.2 Methodology

3.2.1 Readily available documentary, cartographic and photographic sources were consulted. The detailed references to these sources can be found in Section 9, but a short synopsis follows, giving information of the repositories accessed.

3.2.2 The Regional Sites and Monuments Record (SMR) holds a record of all known archaeological sites. No archaeology had been recorded in the development area other than the mine site (PRN 102786) itself, for which little detail was available. Sites on the SMR are identified by Primary Record Numbers (PRNs), which are used throughout this report.

3.2.3 Documentary and cartographic sources relating to the site are held by the National Library of Wales, Aberystwyth (NLW), and the Clwyd Record Office at Hawarden. Documentation relating to the Brunner Mond Company are held at the Cheshire Record Office, Chester. Printed works were examined at the County Record Office and in the Local Studies Section at Holywell Library.

3.2.4 Photographic collections were examined at CPAT, Hawarden County Record Office, and Clwyd County Council, including 1:10,000 aerial photography by Geonex (1985 & 1992) and the Royal Commission on Ancient and Historic Monuments in Wales (RCAHMW). Further photograph evidence was kindly given by Mr Evans of Berthymaen Farm.

3.2.5 Several potential sources of information relating to the site were consulted, including the archives at ICI (Industrial Chemical Industries) and Brunner Mond Ltd., Northwich.

3.3 General History

3.3.1 The history of the site is dealt with chronologically, with the development of the site viewed against the background of the general mining history of the area. The earlier developments up to the end of the 18th century refer to workings outside the development area, and it is only from the late 18th or early 19th centuries that there is any evidence of surface workings within the area concerned.

3.3.2 The main Trelogan Vein is accompanied by several ore-bearing strings. Some of the main winding and pumping shafts can still be seen running north-east from the junction of the Trelogan and Pen-y-ffrith Veins. West Whimsey Shaft (115 yds deep) is located north of the White Horse Farm at SJ12138042; a fenced shaft remains as a grassed-over mound east of West Whimsey at SJ12168042; the Old Engine/Windmill Shaft lies within the area of overgrown waste at SJ12308060, west of Trelogan Farm; Roft Shaft (132 yds deep) is south of the Perthymaen Farm at SJ12388067 and Hannah's Shaft (210 yds deep, see Fig.8) is located at SJ12588075. Hannah's Shaft was the working shaft for the proposed development site. In this area, the chert bed is located 140 yds below the surface overlying the coal

measures clay and the vein has dipped into the coal measures. The main air shaft for the 19th century workings, on the main vein, is located north of the development area at SJ12738096.

3.3.4 Early documents dating from the late 17th century were found among the Erddig manuscripts deposited in the Hawarden Record Office. These include letters from John Key, a mining agent from Holywell, to Joshua Edisbury who was a wealthy landowner and entrepreneur from London who had considerable interests in the Trelogan mines. The documents date from 1689 until he appears to have become bankrupt in 1716, and refer to what appear to have been unsuccessful activities at Trelogan. A letter of 1693 (D/E/724) refers to "good ore" which is coming to the surface and also to the fact that "Londoners are about to set up great works in the neighbourhood and the men are uneasy about it". The "Londoners" are presumably the London Lead Company. At this date "Mr Mostyn is claiming outcropping on the King's Waste". The "King's Waste" or Crown Land is probably the land south-west of the present White Horse Farm on the main vein (see Fig.5). It seems, therefore, that there were a number of parties interested in profiting from the resources available at Trelogan. Edisbury at the time was driving a drainage sough southwards from Gyrn Dingle (west of development site at SJ121809) to drain the middle section of the vein. Despite the "good ore" and all the continued mining activity, the venture appears to have ended with Edisbury's bankruptcy.

3.3.5 The London Lead Company were the pioneers of organised mining activity in Flintshire as a whole. The Company, also known as "The Royal Mines Copper", "The Governor and Company for Smelting Down Lead with Pitt and Seacoale" or more colloquially as "the Quaker Company" was owned mainly by Quakers, who kept excellent Company records and minute books (Raistrick 1938, 10). The Royal Mines Copper had interests in Flintshire from at least as early as 1694, when Anthony Barker was appointed their agent (Bevan-Evans 1960, 81). Trelogan was one of the principal mines worked by the Quakers in the early years of the 18th century (Fig.2).

3.3.6 The direct references to their interests in Trelogan date from the early years of the 18th century. The company had built their smelting works at Gadlys (SJ21357441) in 1704, where they perfected the art of smelting lead by using coal as opposed to charcoal. The Quaker involvement in lead mining and smelting in Flintshire has been well-documented by Bevan-Evans, in three articles published in the Journal of the Flintshire Historical Society (1960-62), using evidence from the Society minute books. In 1714, the Quakers were leasing mines at Trelogan from Henry Glegg (18 years from 1.7.1714), and in 1720, from Sir John Conway (21 year lease from 17.11.1720). They had taken over Edisbury's drainage level in 1714, and were working the main vein near West Whimsey Shaft. In August 1720, the company leased lands in "Pert-y-mane" from Mr and Mrs Parry for 31 years (see Fig.3).

3.3.7 Sir Pyers Mostyn was leasing land to the Quaker Company in 1713 and 1715, which presumably was also in Trelogan, and in August 1713, a party of Quakers visited the site and reported the following:

"The new grant from Sir Pyers Mostyn is very large and promising, they being come to ore in several places.....we never had ye mines in a more flourishing condition. There was never a better prospect of their continuing so for many years" (Bevan-Evans 1960, 111-112).

3.3.8 Reports dating 1721 refer to the vein being worked for some 1,000 yds in length in all, although there were problems of drainage. Of the "vast number of pitts" along the vein, "non of them are reckoned to be 20yds deep because of the water before this level was brought up", and a single drift is recorded for air. A shaft is being sunk on Mrs Parry's land and considerable lead and silver is being produced at Trelogan at this period (Bevan-Evans 1960, 115). Presumably the shaft is the later "windmill and fire engine shaft", located amid Mrs Parry's land (see Fig.3). The Quakers were also extracting calamine for the Bristol brass trade.

3.3.9 In 1729, Quaker visitors, among them Abraham Watson, a Company mine manager from the north of England, had inspected the progress along the Trelogan level, a drainage

level to unwater the mines (Bevan-Evans 1961, 35). Watson later reported on workings at the mine being hindered until the level reached the main vein. He mentions "the great works above the engine" and the length of the "level from ye mouth to engine shaft" is 190 yds in 1729 (Bevan-Evans 1961, 41). The level appears to have been completed in the eastern workings by 1729 and a 1730s account refers to the shaft in Trelogan Deep Level working successfully. The level is presumably that driven from Afon-y-garth in Mc Walters Dingle (SJ13008130) north of the development area, where the choked stone arched adit entrance is visible, at the junction with Saunder's Dingle. The earlier Gyrn Dingle Level driven by Joshua Edisbury had presumably become inadequate. According to the abandoned mine section and plan (AB/133) this level forms the 80 yd. level near Hannah's Shaft below the development area (Fig. 8).

3.3.10 The 1729 documents included by Bevan-Evans (1961) record that at Trelogan, "the Windmill is not yet able to conquer the water there, so as to enable the company to work constantly under level, which yet tis hoped it will do when the new set of pumps sent from hence are got down" having arrived at Parkgate on the Wirral, awaiting shipment to Bagillt (Bevan-Evans 1961, 47). The windmill is depicted on a the 18th century plan (Fig. 3), showing the later fire engine on its north side and the single shaft south of them. The site is located west of Trelogan Farm. At this date Mrs Parry's land, the current proposed development area, appears unoccupied by mining activity on the surface, although the level from Mc Walters Dingle is running below ground.

3.3.11 In a further attempt to overcome their drainage problems, the company sent a surveyor to Trelogan in 1730 "to contrive an engine or engines to drain that mine of water". The surveyor reported that the mine was drowned out and that it had been agreed to erect a fire engine to drain the mine. A 1731 report (Bevan-Evans 1961, 51-54) stated that, in January, the old level had collapsed and all work had stopped. The fire engine was installed along with new shafts and the necessary works to get the mine working again. A further visit in that year resulted in the inspection of a new level, "a new shaft, sunk to 50 yds, in Quitiarteien du" which they hope will eventually cut the new level at 70 yds. The "Quitiarteien du" referred to in the document could be a mis-spelling of Cwetia Rehen du, being the parcels of land south of the windmill and engine shaft or Leadworks, as referred to on the 1770 plan (Fig. 4). In 1741, the Company renewed their lease for the "Quityarhentu Mine" from Elizabeth Parry of Perthymaen. Random 18th century leases include two parcels of land were leased from Sir Thomas Longueville in 1747 for 21 years also.

3.3.12 The fire engine at Trelogan was reputedly the first in Flintshire. It involved the purchase of a de Savery patent (which included the license to operate a Newcomen type engine) for 100 guineas for two years and the cost of the secondhand engine parts from the York Building Company, as accounted in the Quaker minute books are recorded by Bevan-Evans (1982, 62-3); the brass 35" cylinder weighed 32 cwt. and cost £164. The costs of chains, plungers, plug frames and pistons etc are itemised. The engine appears to have stopped working shortly after the Deep Level was cut to meet the main vein in 1735, and worked little after that period, although the windmill continued pumping (Rhodes 1968-9, 219).

3.3.13 Rhodes (1970, 375) refers to documents in the Public Record Office which record the Quaker Company erecting a stamping engine at Trelogan in 1729 for ore dressing. This engine would have been revolutionary at this period. Stamps were in use in Germany in the 16th century, but it is generally thought that John Taylor introduced any mechanised form of ore-crushing to Flintshire c.1830s.

3.3.14 In 1751, when their mine lease was renewed by the Crown, a second engine was erected at Trelogan using parts from the Maeslygan and Bagillt engines that the Quakers had previously erected and various parts from other properties in Flintshire. The engine was needed to pump below the Deep Level and Rhodes (1968-9, 222) suggests it was probably erected at Trelogan Old Engine Pit between September 1751 and July 1752 and remained operational for 10 years. The engine worked intermittently after that due to the high fuel costs. It was dismantled and sold in 1765 and the old engine house used as a stores. The engine stood at Smithy Shaft.

3.3.15 The company was already building a more powerful engine at Roft Shaft (SJ12388067), on the edge of the Crown Lands immediately north of the Old Engine Shaft (SJ12308060). At this time, the Company's mining activity was beginning to centre on land belonging to the Stanleys at Pert-y-maen (Fig. 4). Sir Rowland Stanley encouraged the Company to build the new engine close to his land by reducing the royalties at this time. It appears that there had been disputes since 1734 over royalties due to Sir Rowland Stanley and his lady, the former Elizabeth Parry, for royalties at Perthymaen and later papers from 1761 infer that Elizabeth Parry had leased the "farm of ore" to the Quaker Company for 41 years from 1743 with the proviso that the company build a new fire engine, which presumably refers to the Roft Shaft Engine. The engine parts were purchased in 1762 from the Dale Company, although many of the parts were replaced by Bersham Ironworks (Rhodes 1970, 390). The engine appears to have been worked continuously from 1762 to 1768, despite high running costs. It worked intermittently after that until the Crown lease expired in 1781 and the engine was dismantled (Rhodes 1968-9, 223). Presumably these early engines followed the Newcomen principle, with considerable fuel costs, despite the fact that the Quaker Company owned their own colliery sites at Bagillt.

3.3.16 Documents in the Public Record Office referred to in Rhodes (1970, 417) record small quantities of ore being raised from a "hush" on the hillside below Berthyengam". Hushing was the activity of exposing minerals by washing down water to remove overburden; any record of this method is extremely rare for Flintshire.

3.3.17 In 1782, Sir William Stanley renewed the mine leases for 21 years and Quaker mining activity concentrated on his lands around Perthymaen. By the end of the 18th century, the London Lead Company were beginning to withdraw their interests in Flintshire. Gadlys Smelt Works was sold by public auction in London on September 13th 1792, along with the following:

Lot 1 "A valuable lease of Lead-Ore and Calamine Mine, called Perthymaen, near Newmarket, in the hundred of Prestatyn, held for a term of twelve years from July last"

Mr John Griffiths bought the Gadlys and Perthymaen leases for £700 (Bevan-Evans 1962, 83). Perthymaen seems to have been the only lease still held in Trelogan by the Quaker Company at this time. A Mr James Ewer later succeeded Griffiths as the Perthymaen lease owner and worked this section of the mine and the Crown lands at the turn of the century (Rhodes 1970, 419).

3.3.18 The early nineteenth history of the Trelogan mine is similar to that of the late eighteenth century, but in the latter half of the 1840s there is a break in the activities. Returns relating to the production of lead, silver and zinc show a gap in production figures from 1848 to 1859 and the Mining Journal of 1853-4 reports on the mine being cleared. 1861 correspondence (D/BC/332A) from an Edward Jones of Holywell, presumably an agent, to Silas Evans in Co. Wicklow, following his enquiry about the mine, refers to the previous company folding due to a fall in the price of ore; he mentions the adit level traversing the sett at considerable depth and believes it would take £20,000 to start the mine.

3.3.19 Some exploitation of the mine above adit level was being undertaken in 1859 (D/M/5208), but it was not until 1862 when the Trelogan Mine Company took over the site that full scale production resumed. The Trelogan Mine Company appears to have worked the site from 1862 to 1873. In 1865 the Mining Journal (19.8.1865) records an 80" pumping engine at work at Trelogan. The engine was made by Bracewell and Griffiths of Burnley of Trafalgar Street, Burnley and an account in the "Burnley Advertiser" 1863 (NTD 1078) reports the casting of an 80" cylinder weighing 16 tons, which took 20 tons of melted metal. The cylinder was cast by a cranes lifting two ladles, each capable of holding 10-12 tons of metal. The engine was presumably installed in the large Cornish engine house at Hannah's Shaft.

3.3.20 The interests of the Trelogan Mine Company on the site ceased in 1873. In April 1873, the machinery and plant and five large wooden sheds were up for sale. A list of the articles for sale is included below, as Appendix 1.

3.3.21 No detailed returns were made from 1872 until 1884, although a single return was made for zinc in 1879 when Richard V.Kyrke owned the mine (1879-1881). Returns from 1884 included employment figures. Edward Pearce owned the mine from 1884-1887, but only a maximum of eight people were employed on the site at the time. Letters addressed to Mr. Pickering, the Mostyn Estate agent, refer to take-notes granted to Messrs Pierce, Lewis and Evans, dated 1890, 1893 and 1895 (D/M/5189). Take-notes were a license to search for minerals, before a lease was granted. Pierce and Pearce may be one and the same. The mining returns refer to the site as waste and "waste openwork" in the 1893-1895 periods.

3.3.22 The Brunner Mond company took over the site in 1896 and generated new interest and strong capital investment into the mine. The mining returns record the large tonnages of lead, silver and zinc produced during this period. Employment figures were at their highest in 1899, when 119 people were employed underground and 113 on the surface. Although the underground figures fell gradually to 44, the surface workers were still numbering 104 in 1908, suggesting that considerable activity was involved in the dressing of ore. The Brunner Mond Company developed a process for recovering chlorine from zinc waste and took out leases on several mine sites in Clwyd which had high zinc content in the workings and waste. Chlorine was becoming increasingly important in producing a bleaching powder required in paper and textile industries. They constructed new dressing plants, specifically for zinc processing. The machinery involved is detailed in the sale catalogue. Underground working had ceased in 1909.

3.3.23 The catalogue of plant and machinery for sale on the site in May 1911, on behalf of the Brunner Mond Company is deposited at Hawarden CRO (D/DM/186/81). The sale took three days and *c.*800 lots were disposed of. The sale catalogue is fragmentary, but is included below as Appendix 2.

3.4 Development of the Hannah Shaft site

3.4.1 The first maps of the area show no buildings or mine workings within the reclamation area and that the main focus of activity is to the south-west of the reclamation site (Figs 3-4). During this period the site appears to be used as farmland.

3.4.2 The first development of the Hannah Shaft site is shown on a map dated 1806 (CROH D/DM/136/3: Fig 5). Two buildings are marked on the map in the area of the shaft, but the rest of the development site is marked as idle. It is unclear whether the buildings were related to leadmining, but it is probable.

3.4.3 Further cartographic evidence of mining activity on the site dates from 1849 (D/BC/314; Fig 6). This shows a single building close to the shaft marked as "lead works", while the associated document describes Lot 33 as "mine works and waste, and all let to John Williams and W. Rigby & Co." A later map of 1862 (CROH D/BC/281) shows the same building and plot 33 is again described as "mine works and waste".

3.4.4 The first edition of the Ordnance survey 25" series (Fig 8) shows that considerable building work had been undertaken between 1862 and 1871 and that the main development of the Hannah Shaft site was under the direction of the Trelogan Mine Company. The account in the Mining Journal of 1865 describing the cylinder working in the Cornish engine house (see above para 3.3.19) shows that the development of the site was fairly rapid in the first half of the 1860s.

3.4.5 The main elements of the late 19th century mine had been established by 1871 and include the Reservoir, the winding engine house, the Cornish engine house and the mine offices. Other buildings are shown in the area of the winding engine house. They are likely to

have been constructed of timber as they have disappeared by 1899 and are probably the wooden sheds used for dressing listed in the sales particulars of 1873 (Appendix 1; lots 187-191) which match the dimensions of those shown on the 1871 plan.

3.4.6 The second edition of the Ordnance Survey 25" series (Fig 9) shows that the dressing area has moved to the northern part of the site where three buddles are marked next to a series of three buildings. The other main elements appear to be the same as in 1871, but there have been changes to the buildings in the north-eastern part of the site close to the house and workshops which survive today.

3.4.7 The Hannah Shaft site closed in 1911, but the third edition of the Ordnance survey published in 1912 and surveyed in 1911 shows the buildings as they were at the end of mining at Trelogan. It shows that the main elements of the site, namely the reservoir, the Winding Engine House, and the Cornish engine house were the same as those established between 1862 and 1871. The dressing area has moved from the north of the site and is now concentrated in the north-eastern part of the site around the site office.

3.4.8 The cartographic and evidence shows that while the main elements of the site remained constant from the 1860s until the abandonment of the site in 1911 there were considerable variations in the positions of subsidiary buildings. This perhaps suggests that they were of timber construction and is reflected in the sales particulars of 1911 (Lots 278; 541; 542; 553).

3.4.9 Undated photographic evidence kindly provided by Mr Evans of Berthymaen illustrates in great detail the appearance of the site and some of the machinery used, probably around the turn of the century. A general view of the site (Plate 1) shows that the lower part of the winding engine house was constructed from stone, while the upper part was of brick construction. The Cornish engine house appears to be entirely of brick construction. One interior view (Plate 2) shows the dressing area and includes jiggers and other machinery while another shows the 80" cylinder in the Cornish engine house (Plate 3).

3.5 Recent developments

3.5.1 The site now forms part of the Mostyn Estates, and is leased to Mr. John Evans of Berthymaen Farm, the modern spelling of Perthymaen.

3.5.2 20th century activity at the site includes the removal of material from the tips for roadstone by Clwyd County Council in the 1970s. The site was in use for several years as a council depot.

3.5.3 In 1981 planning permission was granted for reworking of the tips to a company who had been awarded a Welsh Development Association Grant. Hannah Shaft was equipped with an electric pump to raise water and several reservoirs were created among the spoil tips. The activity was short-lived; work ceased after six months and the company was declared bankrupt.

4 FIELDWALKED SURVEY (Fig 11)

4.1 Following the Desktop Survey, a rapid Fieldwalked Survey was conducted of the whole site to locate and map any surviving features of industrial interest. Those features identified were recorded by means of a photographic record in 35mm black and white and colour slide formats, and all structural remains were surveyed and described. The site survey was conducted using an EDM and the results are presented in Fig. 11.

4.2 Individual components within the development area which have been identified as part of this investigation have been allocated an individual Site Number and are listed below.

4.3 **Structure 1** Reservoir.

4.3.1 The reservoir measures c.20 x 14m and is located at the south-west corner of the development site, alongside Berthymaen Farm. Although silted-up and part-filled with farm waste, the solid stone walls survive a maximum height of 2.5m and a width of 1.3m. A sluice has a central position in the north-east wall and a leat can be traced running from it in a north-easterly direction towards the mine site. The reservoir has no apparent source of water so it is assumed that it was filled with mine water pumped up at Hannah Shaft. The reservoir was first recorded by the OS in 1871 (see Fig.8).

4.4 **Structure 2** Silage clamp.

4.4.1 A concrete silage bay, comprising two parallel walls, located in the south-east corner of the site.

4.5 **Structure 3** Winding engine house (see below, section 5.2).

4.6 **Structure 4** Concrete platform

4.6.1 Concrete platform located north of the winding engine house. The base was the loading ramp constructed in the 1970s period by the County Council, when they were using the site as a depot for road gritting. The council originally used the grit from the mine waste, and later stored salt on the site. The area immediately surrounding the concrete base, in front of the winding engine house, had been levelled during the 1970s, and a portacabin was sited there.

4.7 **Structure 5** Concrete platforms

4.7.1 Concrete platforms, supported on breeze blocks, and constructed in the 1980s when the tips were being re-worked.

4.8 **Structure 6** 1980s Reservoirs

4.8.1 The 1980s company laid black plastic membranes to form reservoirs amid the spoil tips. Two rectangular reservoirs are located east of the farm track, defined by banks of mine waste. The black plastic membrane is visible in the southern reservoir, but the northernmost reservoir is now filled with rubbish.

4.9 Structure 7 Buddle

4.9.1 The concrete base of a circular buddle, c.7m diameter, protrudes from the waste, east of Trench A. The buddle is presumably one of four buddles sited in the dressing shed listed in the 1911 sale particulars (Appendix 2 Lots 491-4). There is no evidence of the other buddles as the area in front of the present workshop building has been recently landscaped.

4.10 Structure 8 Wall

4.10.1 Part of a low masonry wall is located on the east side of the buddle (Structure 8). It presumably formed the south-east wall of the building recorded on the 2nd and 3rd edition OS maps of 1899 and 1911 (Figs.9-10). It equates to the size of the buddle house (100 x 70ft), one of the wooden structures listed in the 1911 sale particulars (Appendix 2 Lot 541). The dressing sheds appear to have all been timber buildings on stone foundations. It lies on the margin of the reclamation boundary, but is included because it is so close.

4.11 Structure 9 Fixing Rod

4.11.1 A metal fixing rod set in a timber box is located on the north-east corner of Trench A. The area around the fixing rod was excavated in the trial excavations (see below, 5.3)

4.12 Several mine structures lie just outside of the development area, but are included here:

4.13 Structure 10 Hannah Shaft

4.13.1 The brick-lined shaft c.3.5m diameter has a concrete capping. It remains equipped with an electric pump and has an estimated depth of 100m.

4.14 Structure 11 Wall

4.14.1 The dressed stone wall c.2.5m high are located on the north-east side of Hannah Shaft may have formed part of the Cornish engine house and adjoining boiler house. Several large stone blocks, which would have supported the pumping engine cylinder are located in the cottage garden. The platform area on the north side of the wall is the most likely site of the boiler house.

4.15 Structure 12 Engine base

4.15.1 A solid stone base for an engine is located in the garden of the former mine office.

4.16 Structure 13 Mine Office

4.16.1 The former mine office has been converted to a dwelling at the entrance to the mine site at SJ12628081. Much of the stonework of the original mine buildings has been re-used in the walls around the cottage.

4.17 Structure 14 Wall

4.17.1 The stone walls of one of the dressing sheds are partly re-used as a garden shed at SJ12608082.

4.18 **Structure 15** Workshop

4.18.1 The rectangular mine building has been adapted and re-used as a workshop. The eastern half of the building contained engine bases. An inspection pit has been added to the south wall in more recent times.

5 TRIAL EXCAVATIONS

5.1 Introduction

5.1.1 In accordance with the revised specification two trenches were excavated at Trelogan to assess the nature and preservation of the structures or any other features relating to the mining history of the site. One of these, trench A, was located to investigate the Winding engine house, parts of which were visible prior to excavation. The second trench, trench B, was located to recover evidence of the survival of the buildings at the eastern end of the dressing area where a visible fixing rod was the only indication of surviving buildings.

5.1.2 Excavations were conducted over a period of 5 days between the 2nd and 6th of October 1995 with a staff of 3. The excavations were monitored on the 4th of October by Mr Mark Walters of the Curatorial section of CPAT.

5.1.3 Modern topsoil and mine waste was removed by machine to reveal archaeologically significant structures or layers after which work was continued by hand. Recording was undertaken using standard archaeological methods as outlined in the specification (Appendix 1) and all features and structures recorded using Electronic Distance Measuring equipment with Penmap software.

5.1.4 The height values in this report relate to the site datum (hereafter SD) and refer to the values indicated on the surface contour plan provided by Parkman Environment (Drawing No. 12234/OA/03 Rev A). Two temporary benchmarks were placed in the survey area as a check on this relationship. These are marked on figure 11. The heights are not related to the Ordnance Survey datum as a suitable benchmark could not be found.

5.2 Trench A (Fig 12)

5.2.1 Trench A measured 15m from north-east to south-west and 8m from south-west to north-east and was located to uncover the surviving remains of the Winding engine house which provided power to drive the winding gear located at Hannah's shaft. The area was covered by gorse bushes and immature sycamore trees, but the northern corner and north-western wall of the building were clearly visible before excavation. The exposed parts of the wall were however beginning to decay.

5.2.2 The removal of the overburden, which consisted mainly of dumped mine waste with a covering of topsoil in parts, revealed that the building was substantial and well preserved and that the parts of the wall which had been covered were considerably better preserved than those which had been visible prior to excavation. The walls survived to variable heights, up to 106.641m SD. The waste was not fully removed from between the walls as this was not considered unnecessary in the terms of the evaluation.

5.2.3 The winding house consisted of a number of elements. The most substantial of which were the two stone piers which would have supported the twin horizontal winding engines. They were both approximately 1.5m wide but the tops had been partly truncated, probably during demolition after the abandonment of the mine. The pier to the south-west was more closely investigated and revealed some surviving features which are illustrated on figure 12. These included seven holes, all $\underline{c}$0.15x0.15m square and a flat base stained with rust. Two raised stone plinths with brick edging were sited on each of the piers.

5.2.4 The gap between the piers was $\underline{c}$1.7m wide and would have housed winding drum. Two sockets were found in the walls which would have held the drum axles. To the south-east of these the upper part of the walls were stepped in to make room for the drive shafts.

5.2.5 The dimensions of the piers and the spacing between them makes it certain that the pair of horizontal winding engines and winding drum sold as Lot 415 in the 1911 sale (see appendix 2) were removed from this part of the winding house.

5.2.6 The outside wall of the engine house appears to have been constructed after the piers because where it meets the south-eastern end of the pier it is butted against it. This may suggest that it is a later phase, but it is more likely that it simply represents the way the building was originally constructed. The wall is of limestone construction bonded by mortar and is c0.5m wide.

5.2.7 On the interior of the outside wall on the south-western side was a socket which matched a socket opposite on the pier. These probably held the axle for a fly-wheel.

5.2.8 To the southwest of the engine housing was a brick and stone built platform, the surface of which was at c106.365m SD. Several features were cut into this base, including eight square sockets, all measuring c0.15x0.15m, and two larger slots. The base probably represents the control room of the engine house, and the slots the various controls.

5.3 Trench B

5.3.1 The specification indicated that trench B should be 30m long and 3m wide. It was located in an area where there had been recent landscaping and dumping so that the ground surface varied between 100m and 101m SD. The removal of the modern overburden revealed that any potential floor levels would lie up to 1.8m below the ground surface at the north-eastern and south-western ends of the trench. Because of the safety implications of these potential depths the length of the trench was restricted to 19.5m. This was agreed with the monitor at the on-site meeting on the 4th of October.

5.3.2 The trench revealed a well-preserved mortar bonded limestone wall which was 0.5m wide. The wall ran the full length of the trench from south-west to north-east, with a return in the north-eastern end of the trench which ran towards the south-east. The fixing rod visible before excavation was situated at this corner. The top of the wall varied according to the amount of disturbance caused by recent landscaping. At the north-eastern end of the trench it survived up to 100.886m SD, while in the rest of the trench it only survived up to 99.940m SD.

5.3.3 No floor surfaces were revealed in the trench on the south-eastern side of the wall. Wall footings were however identified 0.85m below the top of the wall (99.079m SD). The material removed from above the level of the footings appears to have been recently dumped as it contained modern debris, including parts of a bicycle. It is likely therefore that any floor levels had already been removed, probably during recent landscaping.

5.3.4 On the north-western side of the wall a wooden launder was revealed. It had been damaged and was missing from the central part of the excavation, but the surviving parts probably lay in approximately their original position. It consisted of a flat wooden base with side planks to form a channel or trough. The top of the surviving launder was at 100.186m SD. The base of the launder did not appear to be on a floor level, so was probably fixed by supports to the wall, although no supports were found.

5.3.5 Excavations were not continued beneath the level of the launder, but the rest of the area to the north-west of the wall was filled with dumped material which consisted of patches of clay, gravel and loam. It was different in nature to the material on the other side of the wall, and contained no modern debris and probably represents material dumped shortly after the abandonment of the buildings.

5.3.6 The launder probably lay in the Breage Table House as the sale of 1911 records its dimensions as 61 x 32ft. This matches the dimensions of the building shown in this area of the 1912 Ordnance Survey plan.

5.4 Finds

5.4.1 A number of large metal finds were recovered from the excavations, but none were stratified. In view of this and their size they were not retained after the excavations but were photographed and recorded on site. They included the following;

Part of a mine truck
Metal cog
Large metal spanner
Three leather boots
Several nails and screws
Metal hook.

6 CONCLUSIONS

6.1 The evaluation at Trelogan has shown that the Hannah Shaft site was an important one in the history of lead mining in the Trelogan area which was one of the most important lead producing sites in North Flintshire. The development of the site did not begin until the 19th-century, but from the 1860s until the closure of the site in 1911 it was the major site in the Trelogan area.

6.2 The main elements of the site which lie within the reclamation area, namely the reservoir, the winding engine house and the dressing areas were established between 1862 and 1871 and remained in use with modifications until the closure of the site. Where parts of these elements were revealed by excavation, as at the winding engine house and the dressing areas, they were well preserved. In contrast where they have been left exposed, as at the winding engine house, they have begun to deteriorate due to weathering.

6.3 The main areas of high archaeological sensitivity marked on Fig 14 correspond to the areas where the main elements of the site were marked on the 3rd edition of the Ordnance Survey map and are thought to be well preserved.

6.4 Areas of lesser archaeological sensitivity are marked where buildings have been shown on plans but are thought to have either been removed at the time of abandonment, as in the area in the eastern part of the site where a possible reservoir was marked on the third edition of the Ordnance Survey plan, or have been disturbed by recent activity, as is thought to be the case in the northern part of the site where a reservoir constructed during waste processing in the 1980s corresponds to the position of the dressing area on the second edition of the Ordnance Survey map of 1899. The area around the winding engine house has also been marked of lower archaeological sensitivity because there may be surviving trackways or foundations of the timber buildings known to be have been here.

7 ACKNOWLEDGEMENTS

CPAT wishes to thank Delyn Borough Council and Parkman Environment for their help throughout the evaluation. The staff of the National Library of Wales, the Clwyd Record Office, the Cheshire Record Office, Holywell Library, and Brunner Mond Ltd of Northwich were all very helpful in the collection of information for the desk-top assessment.

Special thanks must go to Mr Evans of Berthymaen farm for showing us the remarkable photographs reproduced as plates 1-3.

Special thanks also to Pat Frost for her preperation of the general history of the Trelogan Lead Mines.

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CROH D/KK/538 18th century sketch of Trelogan Mines (Lodge Vein and Whim Shaft on Bryn Vein)

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CROH AB/136 1911 Abandonment Section Drawing No.70802

CROH AB/137 1911 Abandonment Section Drawing No.70813 (Holy Oak String Lode)

CROH AB/138 1911 Abandonment Section Drawing No.70814

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Geonex 1985 APs 2185/125-6 (Col)

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Personal photographs of the site owned by Mr Evans of Berthymaen farm.

APPENDIX 1

The particulars of the sale of equipment and structures at Trelogan mine in April 1873

Lots 1-54 consisted of tram wagons, rails etc on the Smith's Yard.

Lot 55 80" Cornish Pumping Engine at Hannah Shaft, including pipes, plates etc.

Lots 59-61 three Cornish Boilers, 33ft long x 6ft 6 "diameter, and the necessary fittings.

Lot 63 Donkey Engine and Lot 64 the feed pipes from it to the boilers.

Lot 85 20" Crusher, with raft wheel and sifting gear, wrought iron shaft and 6ft spur driving wheel.

Lot 86 10" horizontal engine

Lot 87 Pair of 12" winding engines; the following lots included the winding gear, 5ft diameter spur wheel, iron wire winding rope etc.

Lots 92-146 were the contents of the office yard, generally parts.

Lots 149-164 contents of the Smith's Shop, included kibbles, anvil, vice etc.

Lots 165-181 contents of the Carpenter's Shop, including 12" horizontal engine, cylindrical boiler, drilling machines, saws, lathes, belt pulleys etc.

Lot 182 14" horizontal engine on the dressing floor

Lot 183 Cornish Boiler 20ft long x 5ft diameter with fittings

Lot 184 Steam Capstan

Lot 185 Massive Crushing Mill, two pairs of 24" rolls, raft wheel and sifting wheel etc.

Lot 187 Wooden shed, 70ft x 26ft wide with buddles and flooring.

Lot 188 Wooden shed, 70ft x 26ft wide with two jigging machines and flooring.

Lot 189 Wooden shed, 77ft x 29ft wide, seven buddles and flooring.

Lot 190 Wooden shed, 18ft x 12ft wide with two jigging machines.

Lot 191 Wooden shed 29ft x 17ft wide with four jigging machines.

Lots 192-200 consisted of the driving gear for the jiggers, launders and the timber work.

APPENDIX 2

The particulars of the sale of machinery and structures at Trelogan mine in May 1911

Lot 414. An 80" Cornish Beam Condensing Pumping Engine, with massive solid cast iron beam, 31ft 9" centres x 8ft 2" deep at centre, giving an 8ft stroke in shaft and 10ft in house, with all connections, complete for working.
All the engineering parts for the engine are listed.

In the winding engine house;

Lot 415. Pair of Horizontal Winding Engines, 18" cylinders, 3ft stroke, on heavy cast iron beds. Details of the engineering parts include the 9ft diameter x 4ft 6" wide winding drum and 260 yds of steel wired rope.

Lot 416. Double Geared Capstan Engine, 12" cylinder, 260 yds best steel capstan wire rope.

At the Boiler House;

Lot 170-172 were 27ft x 8ft Lancashire Boilers with all their mountings.

Lot 173 Galloway Boiler 24ft x 7ft.

Lot 190 was the corrugated steel span roof that formed the boiler house, measuring 70ft x 48ft wide.

Lot 191 a wooden lean-to shed formed a donkey pump house 25ft x 9ft 9".

In the dressing shed;

Lot 422 Green's Stone Breaker, 16ft 9" complete, with two fly wheels 3ft 9" diam. with fast and loose pulleys, shaking screen and shute,

Lot 413 A Revolving Picking Table 12ft diam., spur and worm wheel etc.

Lot 426-7 2 x Elevators, belt driven with 46 pressed steel buckets.

Lot 429-30 2 x Classifying Trommels 5ft x 2ft 4" driven by a pulley.

Lot 431-2 Two sets of Crushing Rolls and the necessary gearing. Lot 432 was 30" x 16" rolls, with C.I. driving pulley 6ft diam x 8" face, with a chute from the picking table and a chute from the trommel.

Lot 452 Classifying Trommel 5ft x 2ft 4"

Lot 491-494 were Round buddles with frame and driving gear and classifying trommel.

Details of all the engineering parts, belts, launders, even wheelbarrows are listed.

The wooden structures surrounding Hannah Shaft were also auctioned off.

Lot 541 Stone-breaker house with a pitch roof, formed lean-to of Mill House. 21ft long x 17ft span x 12ft high.

Mill House Lean-to from Stone Breaker to Jigger House. 37ft long x 47ft span x 30ft high over stone breaker and 15ft over jiggers.

Jigger House. 58ft long x 48ft span x 18ft from sill to cap.

Buddle House. 100ft x 70ft span x 12ft high.

Buddle and Dolly House. 28ft long x 27ft wide x 9ft high covering an area of 12,700ft.

Lot 542 Breage Table House 9ft x 1.5" counter shafting; a Wilfrey Concentrating Table, perforated Steel Trommel, and 3 x slime classifiers with 4 compartments followed. Lot 548-50 were three 20ft diameter Double-deck Breage Tables with all the pulleys and water pipes etc.

Lot 553 was a second Breage Table House 61ft long x 32ft span.

In the Compressor House,

Lot 697 comprised High Class Air Compressor (nearly new). The Hirnant No.4, Class C.2 mounted on a massive box bed plate, 14" cylinder, two flywheels and all the valves, pistons etc.

Lot 698 was a Lancashire "steam trap and separator"

Lot 699, the Engine House, presumably over the compressor, 36ft a 14ft 6" x 8ft 6" to wall plate.

In the area surrounding Hannah Shaft, various other lots included the contents of No 1 Magazine, a cart weighbridge, steel side tipping wagons, rails etc., a pit cage 5ft 6" x 3ft 4" x 2ft 10" wide,

Lot 114 Green's Stone Breaker,

Lot 278 Wooden shed with galvanised steel roof forming mens latrines and office.

Lot 281 Evans vertical Cornish Pump.

Various items were auctioned on the Fitting Shop Yard and the Front Yard contents included hoisting gear, WI air receiver 20ft x 3ft, two circular tanks 21ft x 3ft diam. The sale included the contents of the Carpenters Shop and the Hannah Shaft Smithy, the Boiler Yard and the Pit Bank.

Day 3 lots included the contents of the ore bin house, the main store, iron store, top store yard, the top stores, the general office and the pay office.

The purchasers were given 3-6 months to remove the lots.

APPENDIX 3
ARCHIVE

Plans and section

Location plan of trenches and features recognised during the walkover survey recorded by EDM and Penmap software. Back-up disks on 5" and 3 1/4" format stored at CPAT.

Photographic Archive

35mm colour transparencies of excavated trenches, features recognised during the walkover survey, and recovered finds.
35mm black and white negatives and contact prints of trenches, features recognised during the walkover survey and recovered finds.
Catalogue of all photographic material.
All the above stored at CPAT.

Report

Originals of the report and associated illustrations. Back-up copies on 5" and 3 1/4" disks. All are stored at CPAT.

APPENDIX 4

LOWER TRELOGAN LEAD MINE RECLAMATION - ARCHAEOLOGICAL INVESTIGATION

REVISED SPECIFICATION FOR AN ARCHAEOLOGICAL INVESTIGATION BY CLWYD-POWYS ARCHAEOLOGICAL TRUST

1 Introduction

1.1 The proposed reclamation of Lower Trelogan Lead Mine affects an area of approx. 4.5ha adjacent to Perth y Maen Farm (SJ 1255 8070).

1.2 This area includes the site of the former Lower Trelogan Lead Mine and consists of a series of waste tips with some structural remains partly exposed.

1.3 The Clwyd Powys Archaeological Trust, in their capacity as archaeological curators for the county, have determined that a field evaluation is necessary to assess the implications of the proposed reclamation on the archaeological resource. Accordingly a brief (No SAI 80 dated 21st March 1994) was prepared by M. J. Walters, which described the scheme of archaeological works required. This brief was subsequently revised on 8th September 1995 following a site meeting to discuss the positioning of trenches, and these specifications have been amended accordingly.

2 Objectives

2.1 The objectives of the evaluation are:

2.1.1 to reveal by means of a combination of desk-based assessment, a fieldwalked survey and evaluation trenches, the nature, condition, significance and, where possible, the chronology of the archaeology within the area of the proposed development in so far as these aims are possible;

2.1.2 to record any archaeology revealed in the evaluation trenches;

2.1.3 to prepare a report outlining the results of the field evaluation and incorporating sufficient information on the archaeological resource for a reasonable planning decision to be taken regarding the archaeological provision for the area affected by the proposed development;

2.1.4 to identify and make recommendations options for the management of the archaeological resource, including any further provision for that resource where it is considered necessary.

3 Methods

3.1 Stage one of the evaluation will involve the examination of all the readily available primary and secondary records relating to this part of the town, including documentary and cartographic sources. Archives and repositories will include the County Sites and Monuments Record, the County Record Office, Hawardine, and the National Library of Wales.

3.2 Stage two will consist of a rapid fieldwalked survey to locate and map surviving features of industrial interest. Surface features will be recorded by means of a photographic record in 35mm black and white and colour slide formats and all structural remains will be individually described and surveyed for inclusion on an overall plan at an appropriate scale.

3.3 Stage three will take the form of two trenches;

3.3.1 Trench A is located to examine the presumed winding house which is shown on the 2nd edition OS map of 1898. The intention is to strip an area roughly 18 x 8m in the hope of identifying the extent of the structure, the engine base and the location of the boiler house. Should the boiler house not be located within the area investigated, a trench c. 6 x 3m will be excavated to the west in an attempt to identify further structural remains. The excavation will be restricted to identifying the structural remains in plan only, as safety considerations prevent the excavation of any structure to their full depth.

3.3.2 Trench B will be located to examine the preservation of two structures at the eastern end of the dressing area, which are shown on 3rd edition OS map of 1912. The main trench will be located along the inner northern side of the larger building, measuring 30 x 3m, with an extension to the north measuring 5 x 3m. Deposits will be excavated to the surface of the archaeology where it is considered safe to do so, but in the event that this at a depth in excess of 1.2m, the decision to excavate further will be dependent on consultation with the curator and the client to determine whether this is required, or feasible.

3.4 The evaluation will be undertaken using standard evaluation procedures:

3.3.1 removal of modern overburden and mine waste by machine;

3.3.2 evaluation of the archaeological deposits by hand trowelling to establish their importance and integrity, but avoiding any unnecessary disturbance of the deposits. All features encountered will be examined as fully as appropriate to fulfil the requirements of the evaluation and within the constraints imposed by time and safety considerations.

3.3.3 all archaeological contexts recorded using the standard numbered context system employed by CPAT. All significant contexts to be planned and/or drawn in section at appropriate scales (as defined in the Evaluation Brief), and photographed in monochrome and colour. All drawn records will be related to control points depicted on modern maps.

3.3.4 all archaeological artefacts and environmental samples recorded and processed in a manner appropriate to the material involved. Those requiring conservation or other specialist treatment will be stored in a stable environment until such times as they can examined by a specialist. All finds, except those deemed to be Treasure Trove, are the property of the landowner. It is anticipated that they will be donated to the appropriate local or regional museum, subject to agreement being reached with the landowner and the museum curator.

3.4 Following the on-site work an illustrated and bound report will be prepared according to the principles laid out in the Evaluation Brief. This will be in A4 format and contain conventional sections on: Site location, Topography and Geology; Historic Background; Excavation; Conclusions and Recommendations and References, together with appropriate appendices on archives and finds.

3.5 The site archive will be prepared to specifications laid out in Appendix 3 in the Management of Archaeological Projects (English Heritage, 1991).

4 Resources and Programming

4.1 The evaluation will be undertaken by a small team of three skilled archaeologists under the direct supervision of an experienced field archaeologist, and will include an industrial archaeologist who will also be responsible for undertaking the desk-based assessment. Overall supervision will be by Dr A Gibson, a senior member of CPAT's staff who is also a member of the Institute of Field Archaeologists.

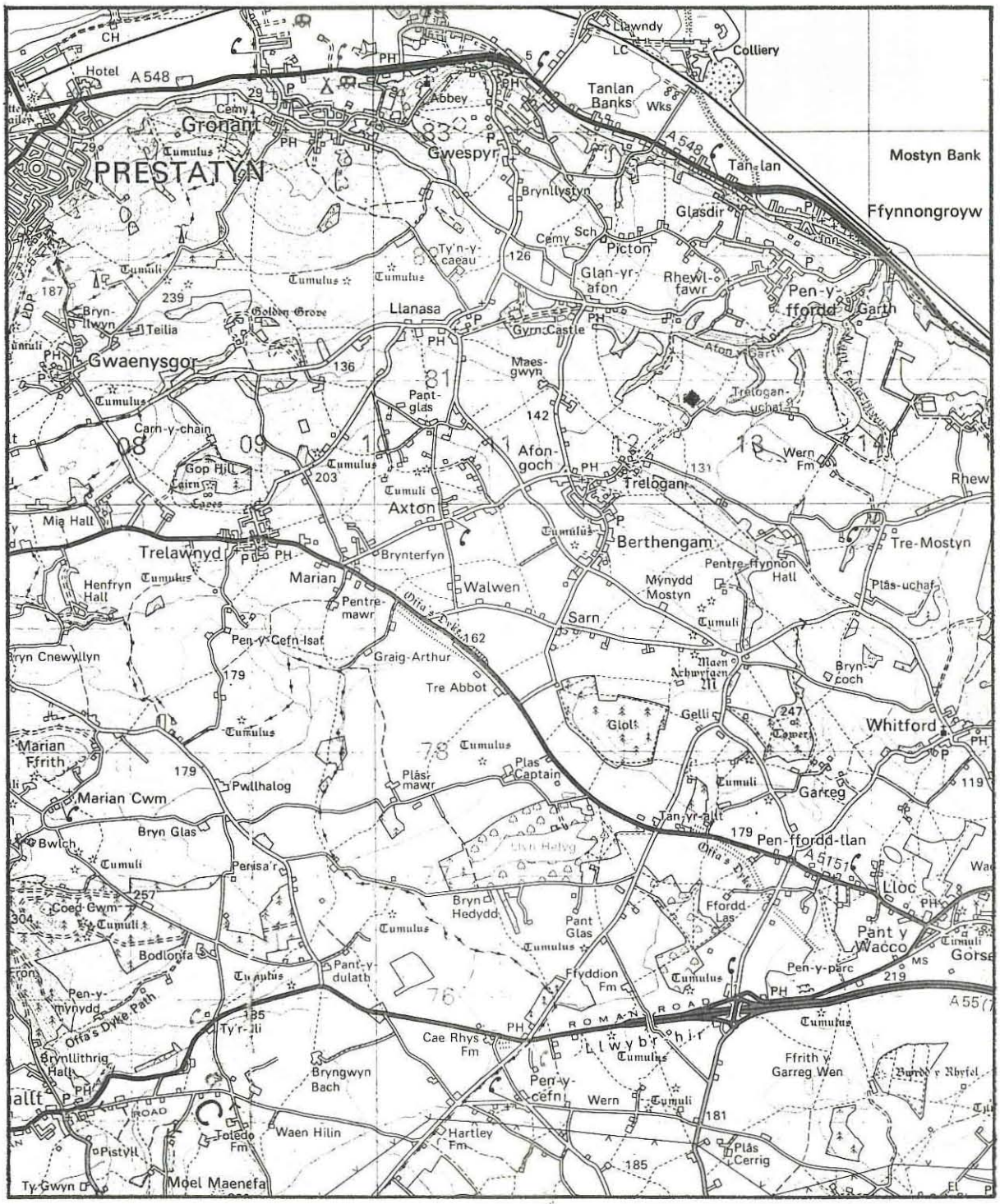
4.2 All report preparation will be completed by the same field archaeologist who conducted the evaluation.

4.3 It is anticipated that the assessment and evaluation will take no more than ten days in all and that the subsequent report would be prepared immediately thereafter, dependent on the client's instructions and the arrangement of a suitable timetable. The date of commencement for the project has been agreed as 25th September 1995, with the field evaluation commencing on 2nd October 1995. The archaeological curator has been informed of the detailed timetable and staffing levels.

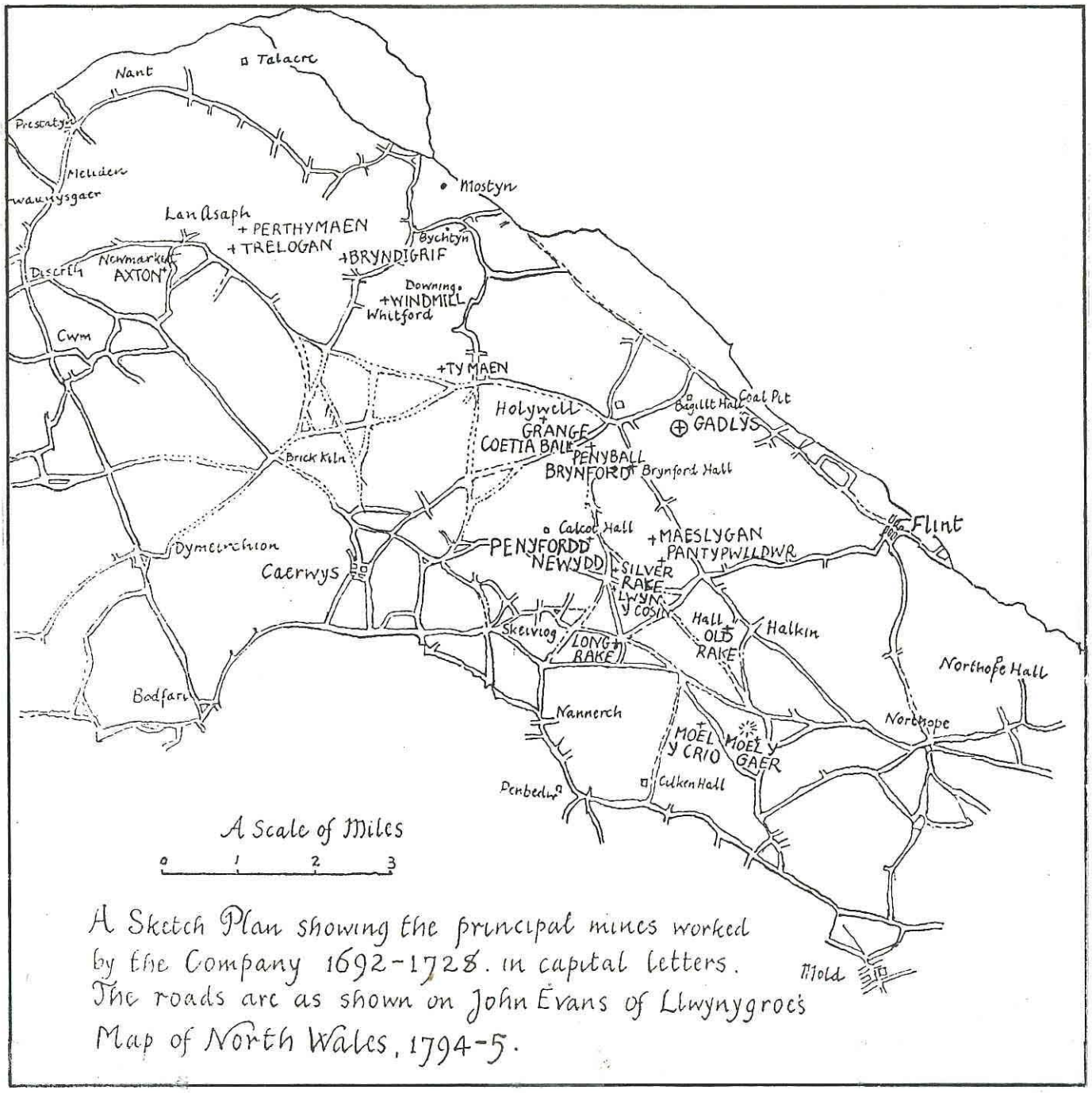
4.4 Requirements relating to Health and Safety regulations will be adhered to by CPAT and its staff.

4.5 CPAT is covered by appropriate Public and Employer's Liability insurance.

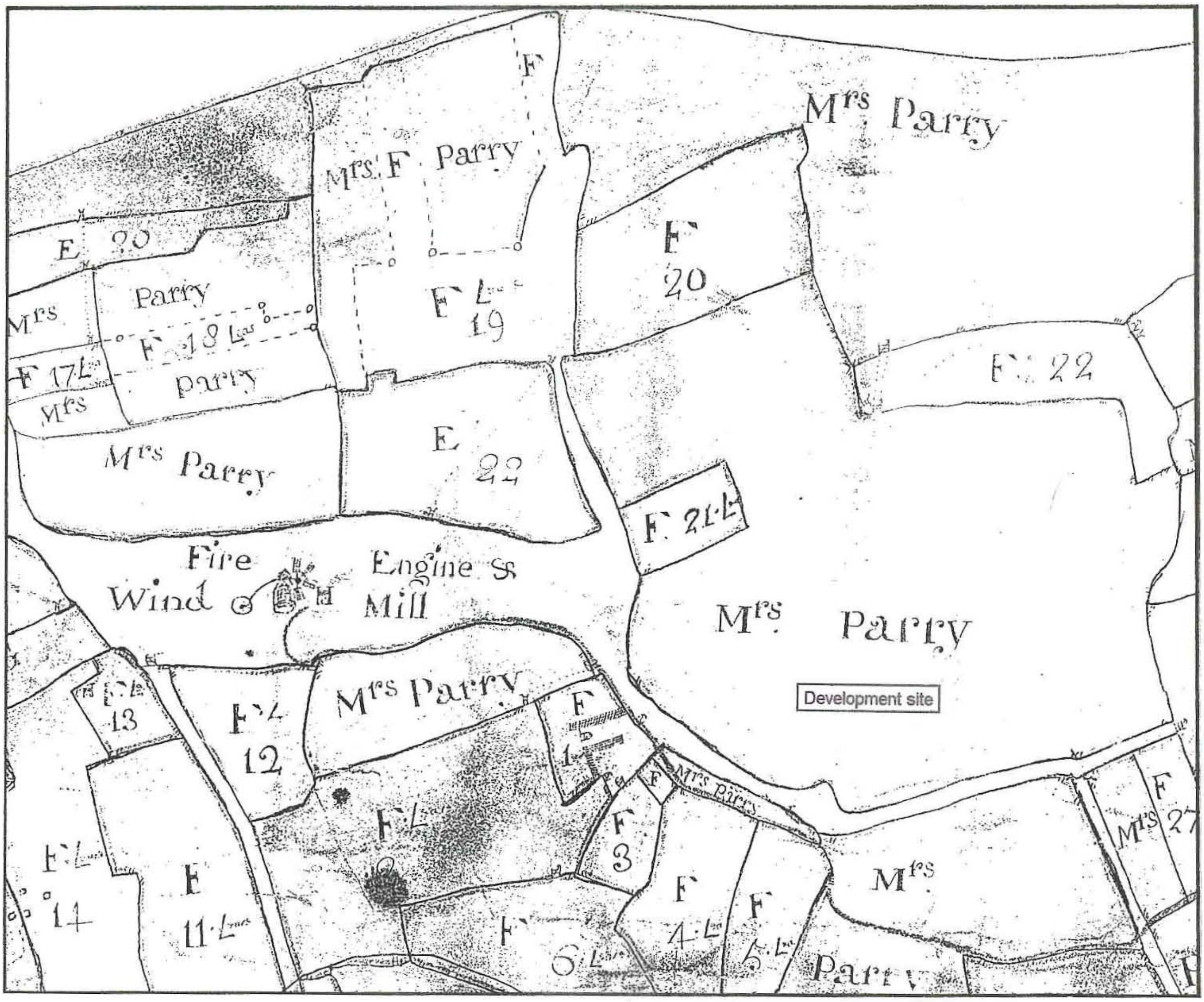
N. W. Jones
21st September 1995

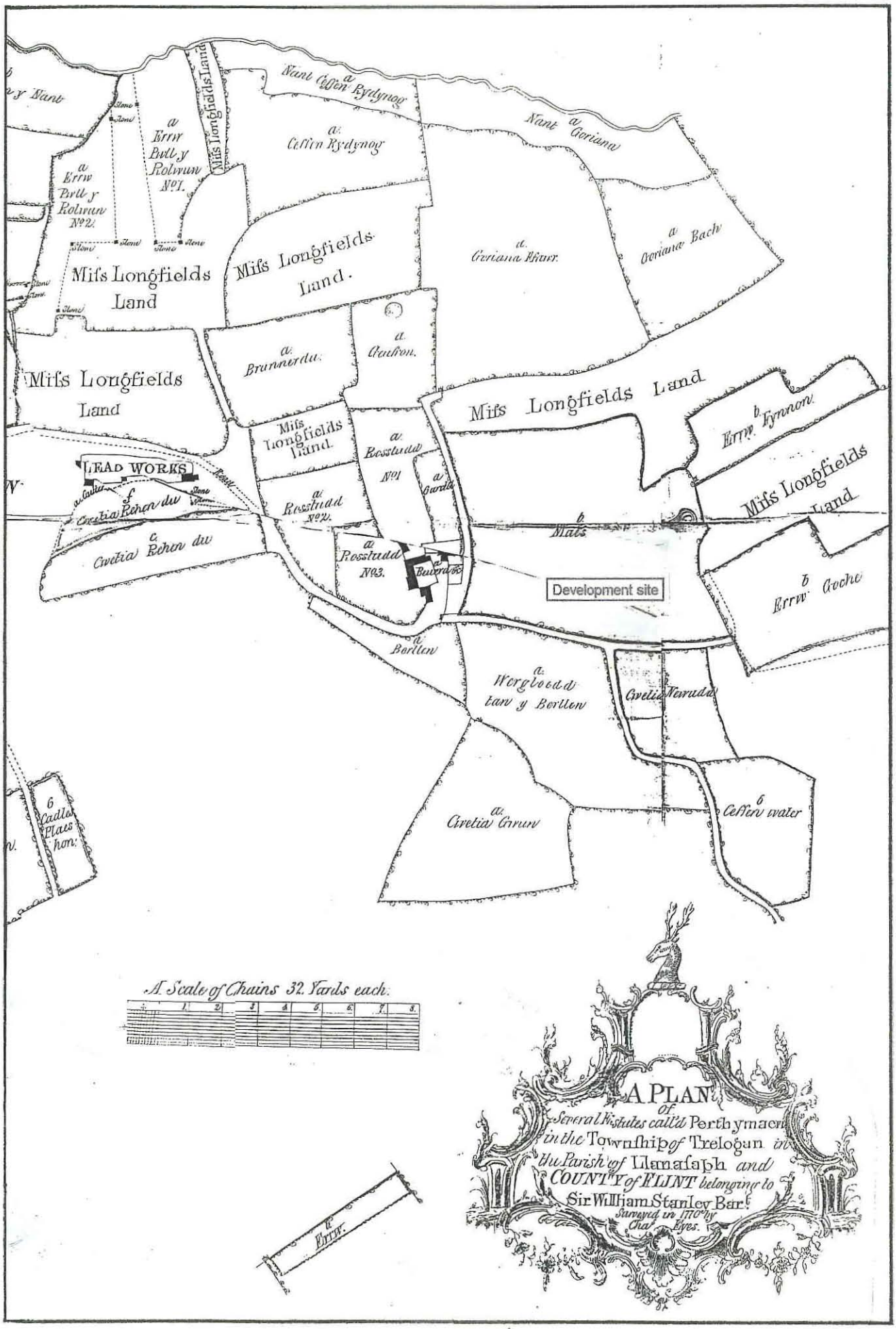


The Clwyd-Powys Archaeological Trust
7a Church Street, Welshpool, Powys, SY21 7DL
Licence No AL 50529A



A Sketch Plan showing the principal mines worked by the Company 1692-1728. in capital letters. The roads are as shown on John Evans of Llwynygroc's Map of North Wales, 1794-5.


Mrs Parry
Mrs F Parry
F 20
F 19
E 20
Mrs
Parry
F 18
F 17
parry
Mrs
F 22
Mrs Parry
E 22
F 21
Fire Engine
Wind Mill
Mrs Parry
Development site
Mrs Parry
F 13
F 12
F 1
F 3
Mrs Parry
F 14
E 11
F 4
F 5
F 6
Mrs
Parry
Mrs 27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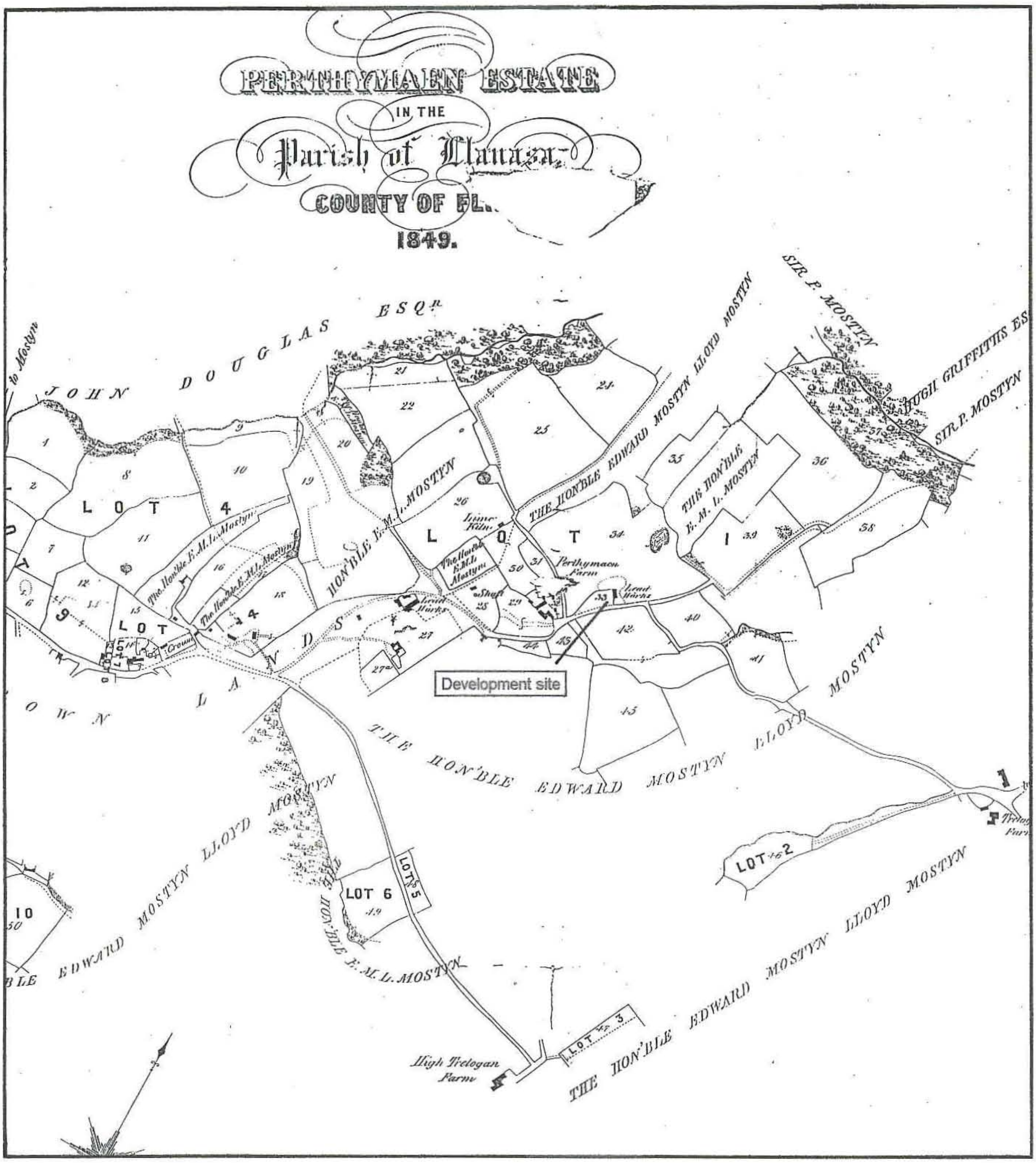
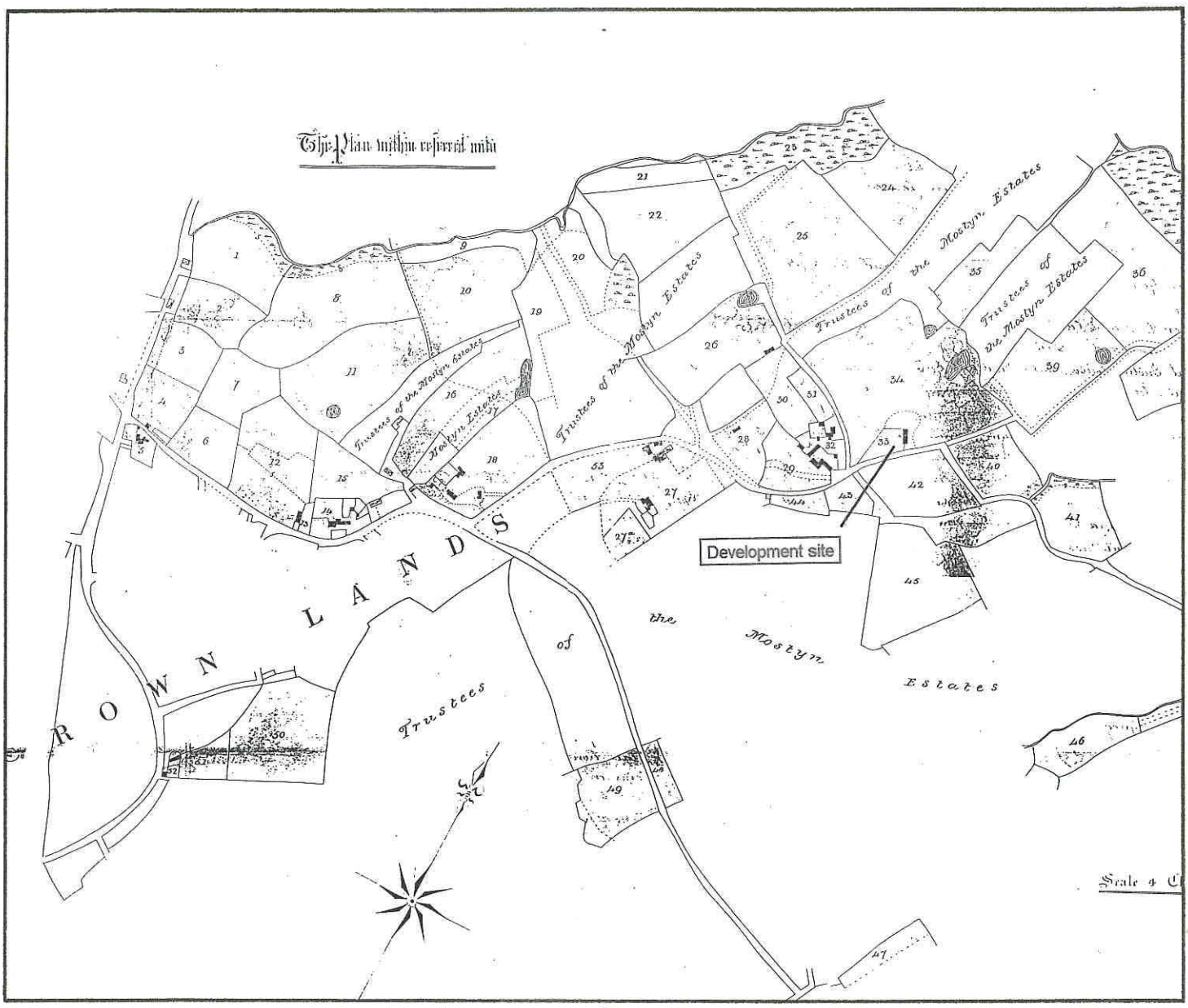
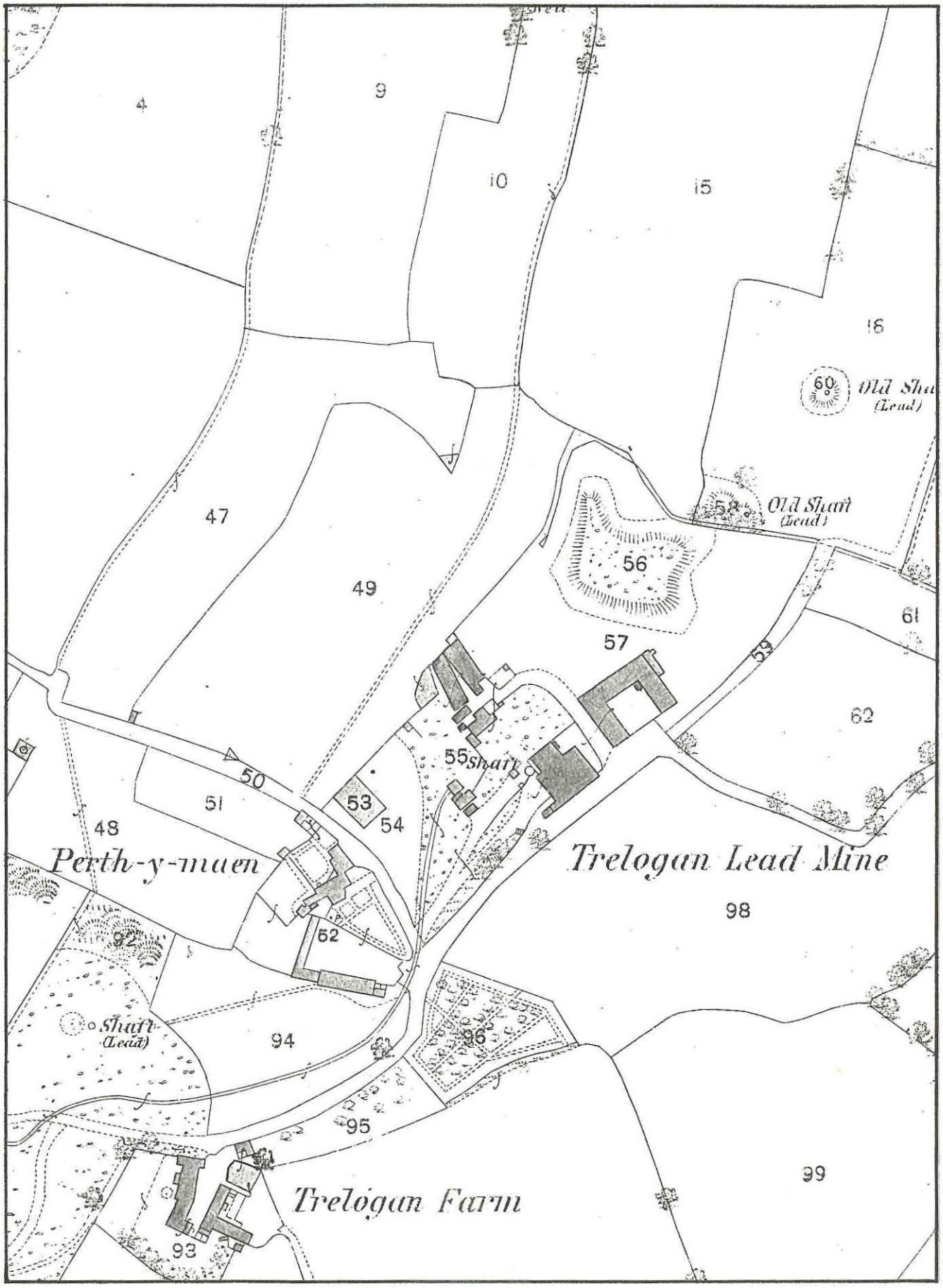
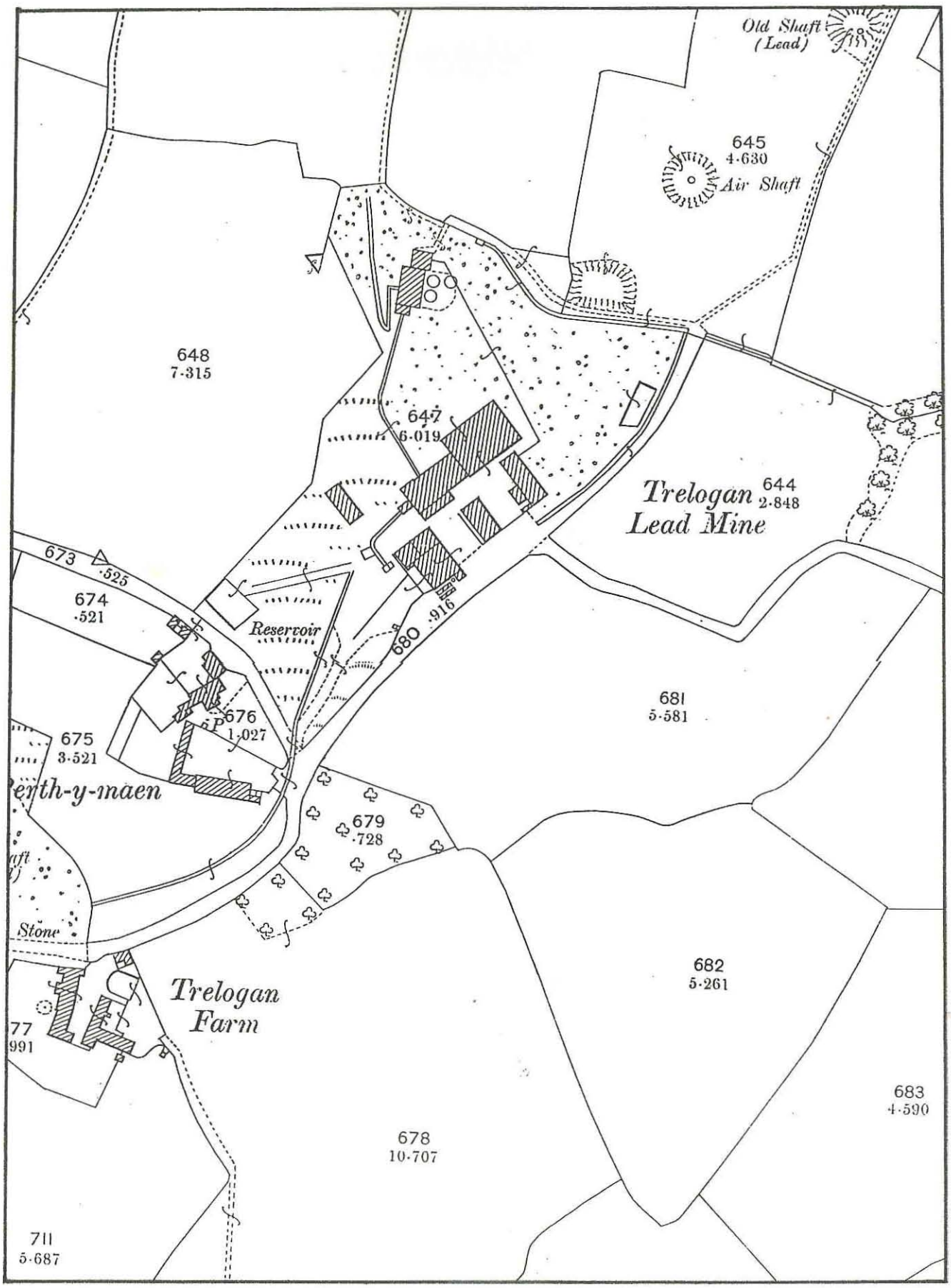
LEAD WORKS
Development site
A Scale of Chains 32 Yards each.
A PLAN
of
Several Fistules call'd Perthymaen
in the Township of Trelogan in
the Parish of Llanasaph and
COUNTY of FLINT belonging to
Sir William Stanley Bar.t
Surveyd in 1770 by
Chas Eyes.

Development site
E.21
E.20
E.19
E.17
E.13
E.14
E.12
E.76
Chas. Standly Esq
E.18
North String
First String
SIR T STANLEY Bt
E.23
E.1
E.4
E.7
E.3
H.5
E.6
H.6
H.4


PERTHYMAEN ESTATE
IN THE
Parish of Llanasa
COUNTY OF FL.
1849.
JOHN DOUGLAS ESQR
to Mostyn
LOT 4
LOT 9
LOT
LOT 1
The Honble E.M.L. Mostyn
HON'BLE E.M.L. MOSTYN
THE HON'BLE EDWARD MOSTYN LLOYD MOSTYN
SIR P. MOSTYN
HUGH GRIFFITHS ESQ
THE HON'BLE E.M.L. MOSTYN
Lime Kiln
Perthymaen Farm
Lead Works
Shaft
Development site
CROWN LANDS
THE HON'BLE EDWARD MOSTYN LLOYD MOSTYN
LOT 2
LOT 6
LOT 5
10
HON'BLE E.M.L. MOSTYN
BLE EDWARD MOSTYN LLOYD MOSTYN
LOT 3
High Trelogan Farm
THE HON'BLE EDWARD MOSTYN LLOYD MOSTYN


The Plan within referred unto
Trustees of the Mostyn Estates
Development site
ROWNLANDS
Trustees of the Mostyn Estates
Scale 4


4
9
10
15
16
60
Old Sha
(Lead)
47
49
58
Old Shaft
(Lead)
56
57
61
59
62
55
Shaft
50
51
53
54
48
Perth-y-maen
Trelogan Lead Mine
98
62
92
Shaft
(Lead)
94
96
95
99
Trelogan Farm
93


Old Shaft
(Lead)
645
4·630
Air Shaft
648
7·315
647
6·019
Trelogan
Lead Mine
644
2·848
673
·525
674
·521
Reservoir
680
·916
681
5·581
676
1·027
675
3·521
erth-y-maen
679
·728
Stone
Trelogan
Farm
682
5·261
683
4·590
678
10·707
711
5·687

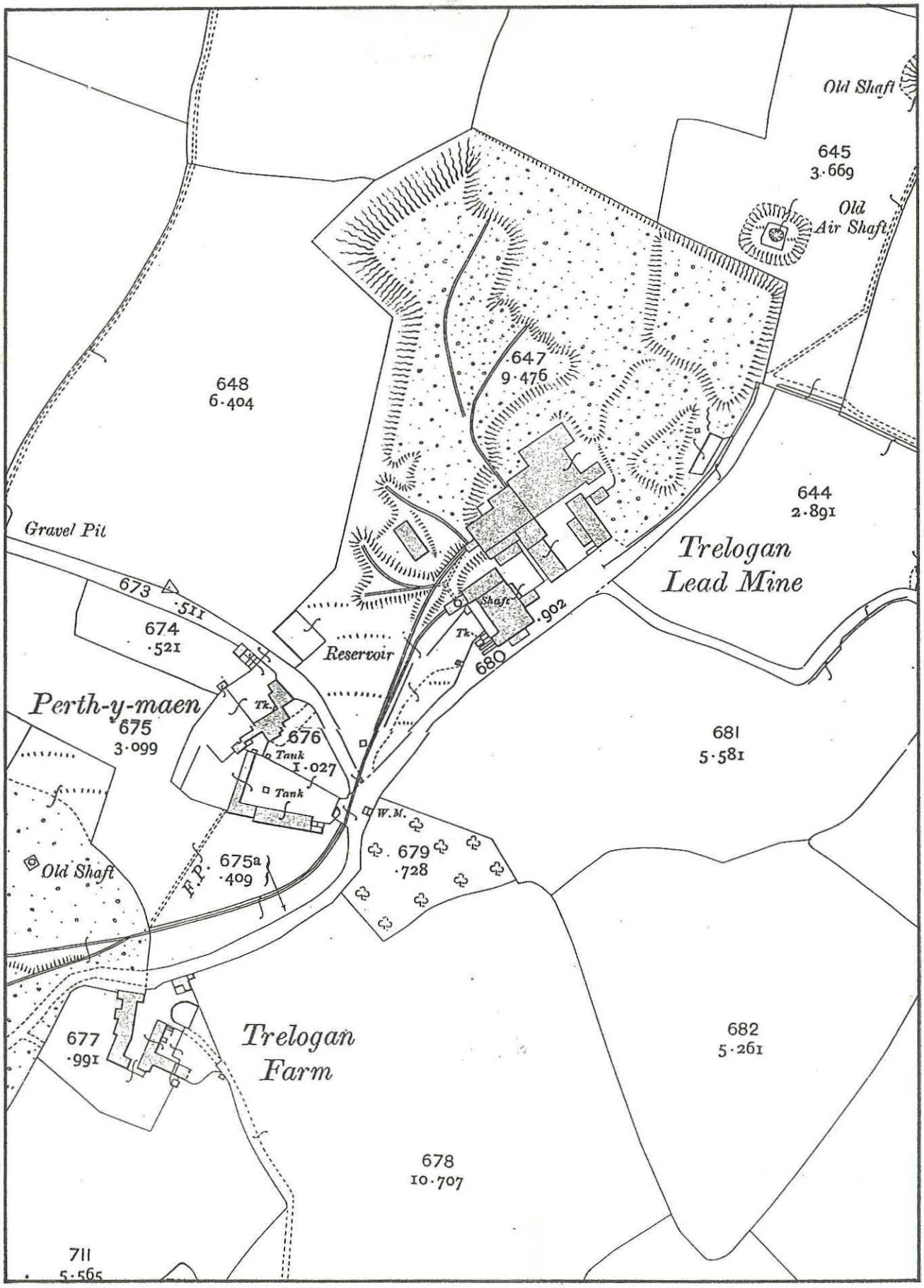
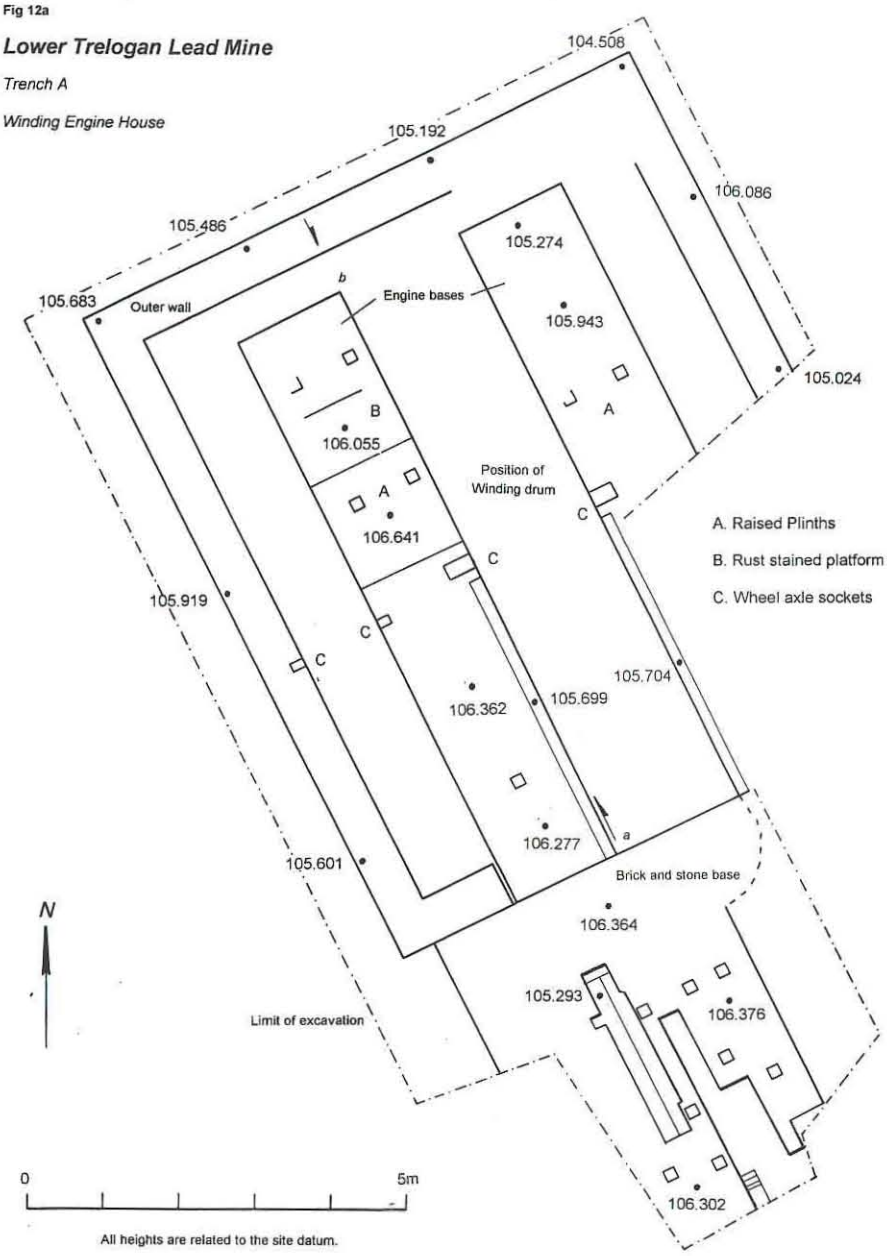

Old Shaft
645
3·669
Old
Air Shaft
647
9·476
648
6·404
644
2·891
Gravel Pit
Trelogan
Lead Mine
673
·511
674
·521
Shaft
Tk.
Reservoir
680
·902
Perth-y-maen
675
3·099
676
Tank
1·027
Tank
W.M.
681
5·581
679
·728
Old Shaft
F.P.
675a
·409
677
·991
Trelogan
Farm
682
5·261
678
10·707
711
5·565

Fig 12a

Lower Trelogan Lead Mine

Trench A

Winding Engine House



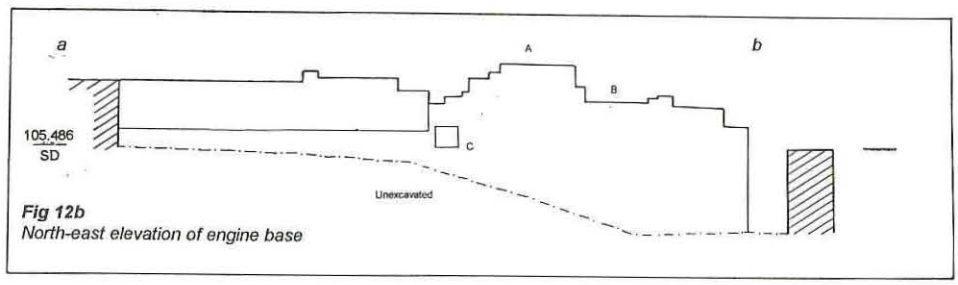


Fig 12b
North-east elevation of engine base

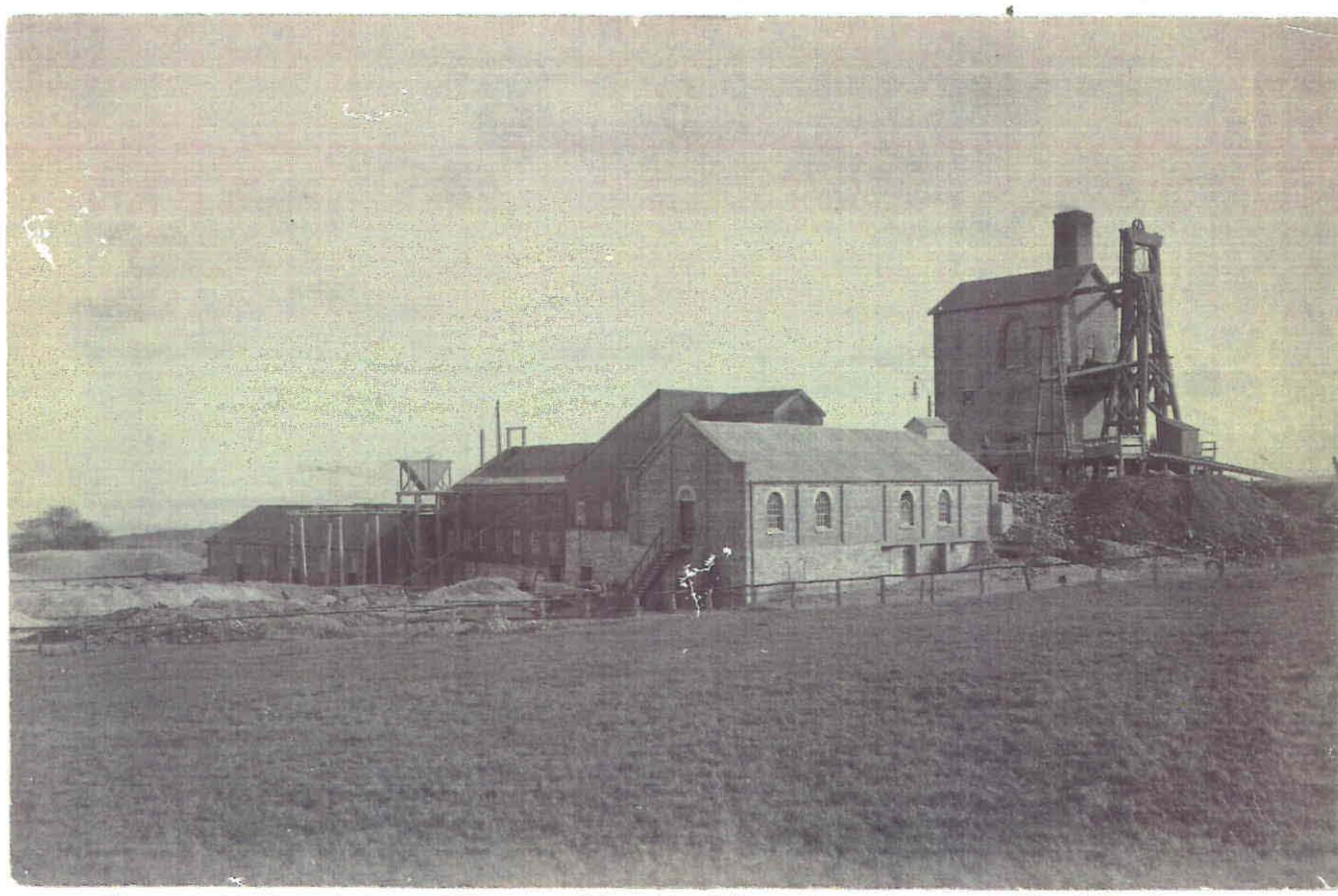


Plate 1. Undated view of Brunner Mond buildings from the west. The Winding House is in the forground, with the Engine House and processing buildings behind.

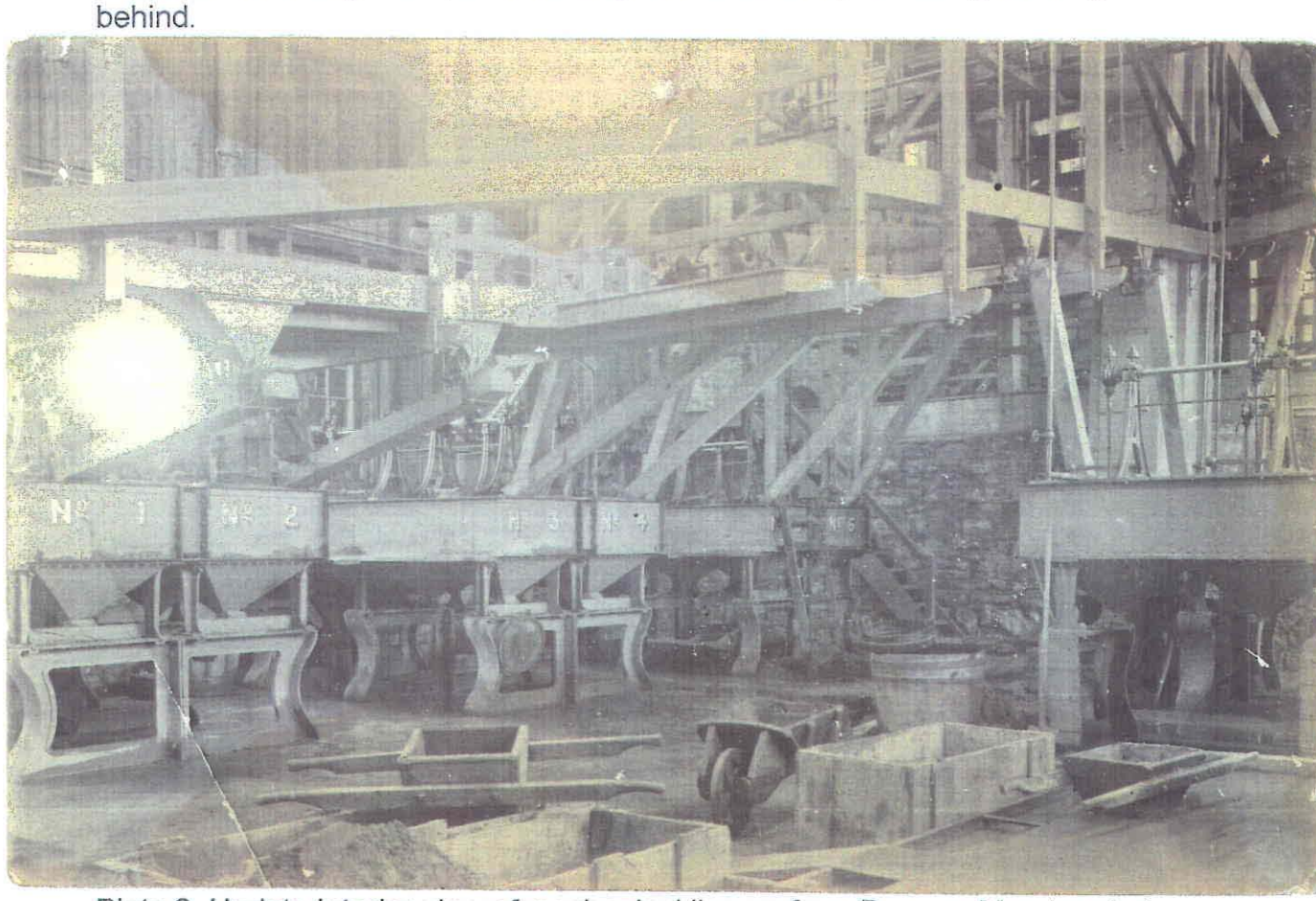


Plate 2. Undate interior view of mechanical jiggers from Brunner Mond period

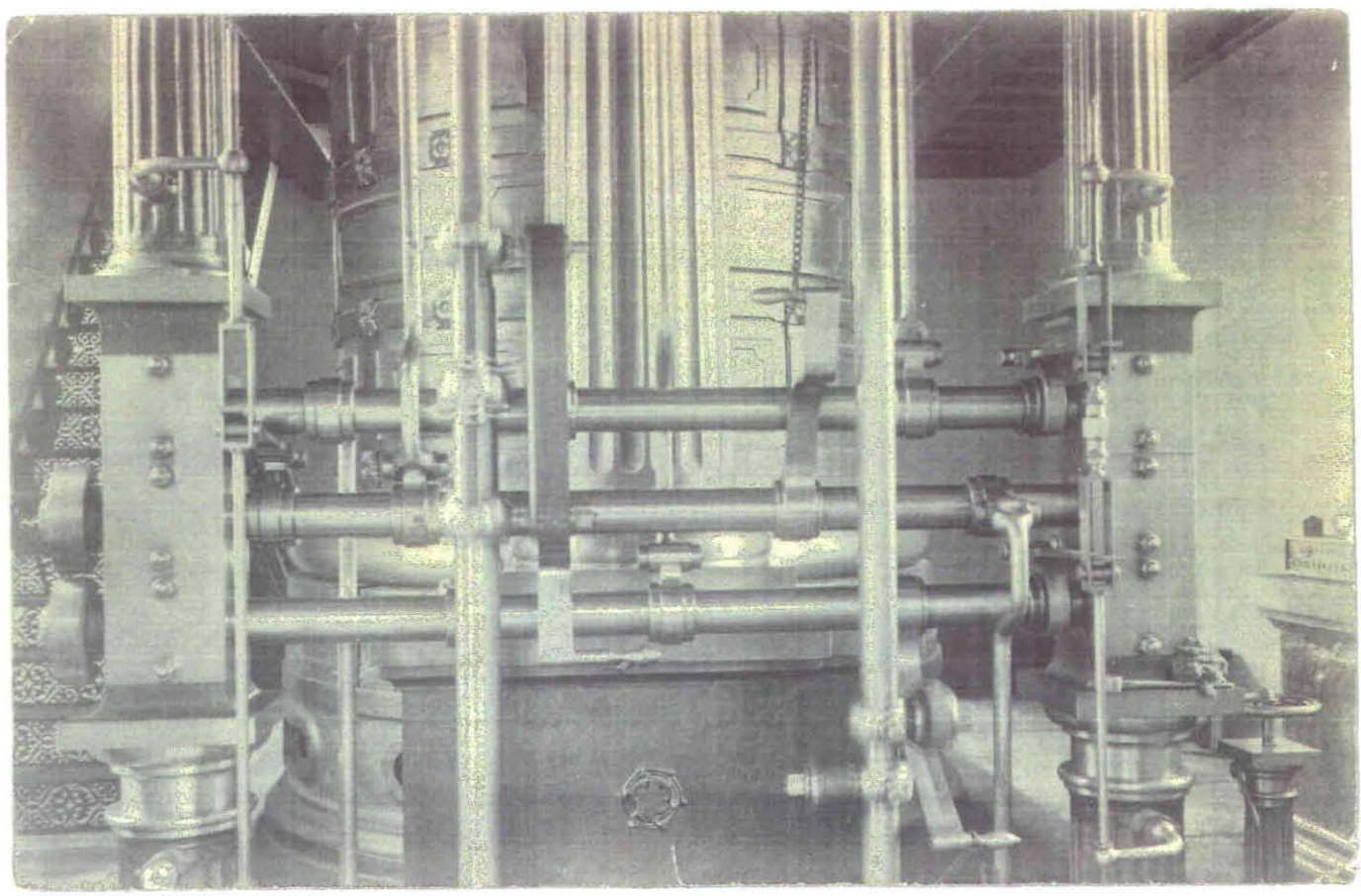


Plate 3. Undated interior view of Hannah's Shaft Cornish Engine House showing the cylinder.