SOUTH-EAST DYFED MINERALS: A SURVEY OF THE ARCHAEOLOGICAL RESOURCE THREATENED BY MINERAL EXTRACTION

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In two parts
Part 1

Consultant: Dyfed Archaeological Trust Ltd.
The Old Palace, Abergwili,
CARMARTHEN, Dyfed, SA33 2JG

Report by: K. Murphy, BA. MIFA
P.Sambrook, BA

Client: Cadw, Brunel House,
2 Fitzalan Road,
CARDIFF, CF2 1UY

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1 SUMMARY

The purpose of this project is to gain more information on the sites and monuments and associated landscapes of SE Dyfed threatened by mineral extraction. This will enable the Trust and Cadw to assess their relative importance and provide a consistent and objective basis for planning advice.

Initially, a desk top study was carried out. The information gained from this was supported by field visits to rapidly assess the present state of the archaeological resource. In total, about 850 new sites were identified and examined. Many other sites which were recorded only through documentary sources on Dyfed Archaeological Trust's *Sites and Monuments Record* also benefited from a field visit.

The greatest number and highest density of sites were recorded on Carboniferous limestone and millstone grit. The vast majority of these sites are associated with the limestone extraction and burning industry. The number and density of archaeological sites on the coal measures was far lower. Here, though, there is a greater range of archaeological sites and a greater diversity in the historic landscape.

Except for the working areas of large quarries, all the land with planning permission for quarrying was examined. Because of lack of time, it was not possible to visit all the sites which British Coal have designated as areas of future interest. However, an approximately equal amount of ground was examined in the field, in the limestone/millstone grit part of the survey and in the coalfield survey area.

Because of the large number of sites associated with limestone quarrying and burning recorded in this survey, a greater emphasis was placed on the background study of this industry rather than on the study of the coal mining industry and sites of earlier periods.

All the records generated during the course of this survey have been integrated with Dyfed Archaeological Trust's computer-held *Sites and Monuments Record*. The numbers referred to in this study are the record numbers on the SMR (see section 11 Catalogue of sites).

2 RECOMMENDATIONS

2.1.(i)
At the moment, only three lime kiln sites enjoy any form of statutory protection - kilns 24702, 25537 and 27792 are listed buildings. 24702 is listed as part of a group centred on Llandyfan House. The other two sites are very large banks of kilns associated with the lime works of Pentregwenlais and Cilyrychen. It is clear from this study that these sites do not reflect the full range of kiln type in SE Dyfed. It is therefore recommended that the following are considered for listing by the Secretary of State under the provisions of Planning (Listed Buildings and Conservation Areas) Act, Section 1:

16304 (Map 17), well-preserved examples of large, late 19th century stone-built kilns alongside a public road.

27173 (Map 13), a good example of a mid 19th century medium-sized stone built kiln.

27249 (Map 9), a good example of a medium-sized stone-built kiln dated 1857.

27294 (Map 7), a very large and most unusual bank of kilns later converted to a crushing mill, part of Pistyll Lime works.

27571 (Map 13), a good example of a mid 19th century medium-sized stone-built kiln.

2.1 (ii)
In addition it is recommended that a group of earthwork kilns should be considered for scheduling by the Secretary of State under the Ancient Monuments Act 1979. This group should, at the minimum, include earthwork kilns 27113, 27431-2, 27461 and 27790, and the stone-built kiln 27100 (Map 6). This group of earthwork kilns was selected for scheduling in preference to areas of extensive lime workings on the Black Mountain because of their good state of preservation and the kilns' tight distribution within well-defined field boundaries.

In addition to individual structures, consideration should be given to scheduling the whole or part of a **working complex** containing kilns, quarry faces, and access tracks or tramways and other ancillary features such as the Banc-y-Mansel complex (nos. 27594-96).

The kilns at Pistyll Lime Works (27294) may seem an odd selection for statutory protection as kilns at two out of the four large lime works in SE Dyfed are listed. This selection is justified on the grounds that these large lime works are vulnerable to modern development - Mynydd-y-Gareg Lime Works is demolished, Pentregwenlais is partly demolished and Cilyrychen lies wholly within a working quarry - and because Pistyll kilns are a unique monument.

2.1 (iii)
Two dated kilns, 27319 - dated 1887 (Map 13) and 27196 - dated

1815 (Map 15), are of sufficient quality to warrant listing. Both, however, lie within areas of consent granted by the Planning Department of Dyfed County Council. It is noted here that kiln 27196, a relatively small, well-preserved stone-built structure, would make an ideal candidate for transference to the Welsh Folk Museum, St Fagans, should one ever be required.

2.2.(i)
It is recommended that a further stage of work should be undertaken to refine the typology of kilns put forward in this Report and to undertake more detailed, selective recording of individual structures (plans, elevations, photographs) and their settings to produce a Report suitable for publication.

2.2. (ii)
Attention has been drawn in the Report to the detailed landscape study of Carmel Woods, commissioned from DAT by CCW. It is recommended that for the limestone belt further, similar landscape based studies be carried out as a basis for the assessment of the relative importance of individual areas under threat.

2.2. (iii)
The Report highlights the lack of study of the historic landscapes of the anthracite coal areas. The areas under consideration by British Coal for open cast coaling are numerous and extensive. British Coal owns almost all the land within these areas and it is uncertain what the impact of imminent privatisation will be. In addition there are signs of private enterprise applications. The areas of interest contain large numbers of derelict farmhouses and other buildings, many of which are of architectural and historical interest. Many are located on historically significant settlement sites of medieval if not earlier origins.
It is recommended that more detailed landscape-based studies of potetential open cast coaling areas be carried out, which would need to give added consideration to the derelict buildings aspects, as a basis for the assessment of the relative importance of individual areas under threat.

It is recommended that more detailed recording of lime kilns, crushing mills and ancillary features associated with limestone quarrying is undertaken. The result of this would be incorporated with information from the present study to produce a report suitable for publication.

3 THE STUDY AREA

No specific boundary was designated around the study area. A broad band of interest was identified roughly following the geological occurrence of Carboniferous limestone, Carboniferous millstone grit and the coal measures (Map 1).

Within this band of interest detailed study areas were selected. The presence of a threat to the archaeological resource was the main criterion used when selecting detailed study areas. Because active quarrying of limestone and millstone grit is confined to relatively small areas, the detailed study areas around these encompassed considerable amounts of land outside quarrying consent areas to ensure that a unbiased sample of the archaeological resource was examined and recorded. On the coal measures, areas of interest for future open cast sites are very extensive. Here the archaeological survey was confined within strict boundaries as defined by British Coal.

The limits of the detailed study areas are defined on the maps accompanying section 8.

4 METHODOLOGY

4.1 Desk top study

Details of all sites recorded on DAT's Sites and Monuments Records computer-held data base within the study area's broad band on interest were transferred to an out-station computer. Copies of relevant 1:10,000 SMR record maps were used and annotated with fresh information as the project progressed.

New sites were added and the records of previously recorded sites edited directly onto this computer-held data base with information collected from Ordnance Survey 1:2500 first and second edition maps covering the broad band of interest. Where the 1:2500 maps were not available then reference was made to OS 6" maps. Recent OS 1:10,000 were also examined. Further information was gleaned from estate maps held in Carmarthen Record Office (in particular 19th century maps of the Cawdor Vaughan, Dynevor, Derwydd and Stepney collections) and from relevant tithe maps. Because of time limitations, this process was undertaken over a wider area for the limestone and millstone grit areas than for the coalfield.

A rapid search through printed sources was made for information relevant to the study of limestone quarrying and burning and to the history of coal mining. A scan was made of schedules and documents held by Carmarthen Record Office in order to add some detail to the more important sites. This information was added to the computer-held data base.

Information on lime kilns and limestone quarrying from the National Archaeological Survey of the Black Mountain was incorporated into the data base. This information was kindly supplied by staff of the National Monuments Records based with RCAHMW.

Vertical and oblique aerial photographs held by DAT were examined. These proved to be of little use in identifying new sites on the limestone because of the nature of the terrain and vegetation. They were more useful on the gritstone and coal measures.

The current status and areas of consent of quarries was obtained from the County Planning office, Dyfed County Council. Possible future areas of interest for open cast coal operations was obtained from various consultation documents supplied by British Coal.

4.2 Field Survey

On the limestone and gritstone, field examination of sites concentrated in and around quarries with planning consent and in areas where the desk top study had highlighted concentrations of old quarries and lime kilns. On the coal measures only the areas designated as areas of interest by British Coal were selected for field examination. Because of the lack of time it was not possible to examine all these areas (see section 8 for those areas examined). Also, areas such as the Black Mountain and the millstone grit moorland of Mynydd Llangyndeyrn, which have had a high

archaeological input in the past and where there is no threat to the archaeological resource, were not examined.

A brief description of all sites encountered in the field was made and where appropriate a sketch plan or elevation drawn and photographs taken. The results were then incorporated into the computer-based data base.

At the end of the project all the newly created records (*circa* 850) and existing but edited records (*circa* 200) were reloaded into DAT's SMR computer-based data base and the relevant 1:10,000 base record maps were amended. In certain areas the density of newly discovered sites exceeded 60 per sq. km. In these instances 1:2500 OS maps were used for the SMR base record maps.

5 GEOLOGY AND TOPOGRAPHY (Map 1)

Bands of Carboniferous limestone and millstone grit form the most distinctive physical feature of SE. Dyfed. Combined, these two geological beds form a band often no more than 500m wide, but because of their relative resistance to erosion they form a distinctive spine which runs from the coast at Kidwelly to the Black Mountain. A twin spine is in fact present, the higher being that of the millstone grit.

The Carboniferous limestone to the N. of the millstone grit forms a discontinuous broken spine at its W. end with outliers, such as Limestone Hill and Blaenyfan, projecting from lower lying ground covered with drift deposits. At Mynydd Llangyndeyrn the limestone achieves *c.* 250m, a height which is generally maintained or bettered to the Black Mountain and beyond. The limestone is craggy and often has a steep N. facing slope. The vegetation on the Black Mountain limestone is treeless rough pasture. Elsewhere, the dominant vegetation pattern is small fields of improved pasture with woodland on the steep craggy slopes. At Carmel Woods, the woodland has been demonstrated to be ancient. This is the largest block of woodland on the limestone. Other areas of woodland may be equally as old. There is a dispersed pattern of settlement across the limestone. Most of the present-day farms and cottages are sited at the foot of the N. facing slopes or at the limestone/gritstone interface. There has been much quarrying of the limestone in the past and several large quarries are still in operation.

The spine of the Carboniferous millstone grit begins at Mynydd-y-Garreg, near Kidwelly, in the SW. of the study area. Here it achieves a height of about 150m. From this point the millstone grit forms an continuous spine rising to over 600m on the Black Mountain and broken only by the Cennen and Llwchwr valleys. On the Black Mountain the outcropping millstone grit widens into a two or three kilometre wide band. The millstone grit spine forms a very distinct landscape feature. It is more rounded than the limestone but with stony outcrops. The vegetation is dominated by dry heath with a high bracken content. On the higher ground in the E. of the study area local peat deposits occur, whilst on the highest land on the Black Mountain there is much blanket bog. Most of the land on the millstone grit is unenclosed and there are very few settlements on it. There is much evidence of former millstone grit (silica) quarries. Working quarries now number just two and these are relatively small operations.

The Carboniferous coal measures (the anthracite coalfield) comprise a band between four and six kilometres wide to the S. of the millstone grit and limestone. At the W. end of the study area, near Kidwelly and Trimsaran, the land is only fractionally above sea level, but it rises to the E. generally achieving heights of 150-200m. The coal measures are dissected by the Gwendraeth Fawr, Llwchwr and Amman valleys and are covered in many areas by glacial drift deposits. Two important historic settlements, Kidwelly and Llandybïe, lie on the coal measures, but overall the settlement pattern is one of dispersed farms over which a series of 19th- and 20th century industrial communities has been superimposed - Trimsaran, Pontyates, Pontyberem, Dre-

fach, Tumble, Crosshands, Ammanford and Cwmamman. The land is divided into small fields which are given over to permanent pasture. The quality of the land is poor, and suffers from water-logging. When neglected, rushes quickly establish themselves. There are remains of many coal mines in the study area, but the only deep mines now working are small-scale and privately owned. Open cast operations are now the main form of coal extraction.

6 THREATS (Map 2)

6.1 Limestone and silica quarries

There are 19 quarries in the study area with planning permission (Map 2). Of these, 10 are active (Mynydd-y-Garreg, Blaenyfan, Torcoedfawr, Torcoed, Ty'r Garn, Danylan, Castle, Allt-y-Garn, Cilyrychen and Craig-yr-Odyn), but only seven were actually working at the time of this study (see Table 1). Allt-y-Garn is a relatively small scale operation working on silica stone. Mynydd-y-Garreg was not working in January 1994, but is listed as active by the Planning Department of Dyfed County Council. The other five working quarries are large-scale operations working on limestone. Blaenyfan and Torcoed have had recent approval for extensions to their working areas while Torcoedfawr, Cilyrychen and Craig-yr-Odyn are working towards the limits of their consent areas. It seems likely, therefore, that some of these working quarries will seek permission to extent their areas of consent, or permission will be sought to open new quarries .

No decision has yet been reached on the public enquiry concerning the IDO on the Carmel Woods area. If permission is not granted to quarry, then MacAlpine Ltd will have to seek an alternative site. Currently their main quarry in the area, Cilyrychen, is almost exhausted.

Table 1. List of working quarries in 1992 in the study area

Quarry	Product
BLAENYFAN Llangyndeyrn	Limestone
TORCOED Llangyndeyrn	Limestone Tarmacadam
TORCOED FAWR Llangyndeyrn	Limestone
MYNYDD-Y-GAREG Kidwelly	Silica stone
GLANGWENLAIS AND CILYRYCHEN Llandybïe and Llanfihangel Aberbythych	Limestone Tarmacadam Pre-mix concrete
ALLT-Y-GARN Llanfihangel Aberbythych	Silica sandstone Clay
CRAIG-Y-ODYN Llandeilofawr	Limestone

6.2 Open cast coaling operations

There are three very large open-cast sites currently working in the study area (Ffoslas, Gilfach Iago and Garnant) and many more former sites have now been reinstated (Map 2). Eleven areas have been identified in this study in which British Coal have an interest. Applications for planning permission have been made for Rock Castle West and Blaen-y-Glyn. The status of the remainder is unclear. For instance at Glanstony, which British Coal designated as `General area of future interest within 5 years', most of the land is owned by British Coal and many of the farm buildings are demolished and the land left vacant. Glanstony and Syddyn Melyn to the E. of Glanstony was `undergoing investigation' some six years ago, but does not now feature in British Coal's plans. British Coal do however own the land, geological exploration has been undertaken, the farms are vacant, buildings decaying, and the land is reverting to scrub. Planning permission was never applied for.

The status of individual sites (where known) is given in the relevant parts of section 8.2. It is important to stress that on open cast coal sites much destruction to the built heritage occurs before planning permission is sought.

7 ARCHAEOLOGY

7.1 Prehistoric and medieval archaeology

The densest concentration of prehistoric sites within the study area lies on the millstone grit. These sites have a restricted date- and type range, mainly comprising bronze age funerary- and ritual monuments. These monuments are generally well-known and have been the subject of several studies (Ward *passim*). Of especial note are the groups of monuments on Mynydd Llangyndeyrn, Carmel Mountain and the Black Mountain. Sites of a similar date to the above were discovered in the course of this study, in particular a ring-barrow (27421) and possible round barrows (27491 and 27493), all at Careg Dwfn.

There is a greater range of prehistoric site on the limestone and coal measures, but a lower density. Iron age enclosures have been noted in the Glanstony area (1638), Limestone Hill (8459), Rock Castle and Blaen-y-Glyn (851) and Cilyrychen (4869). The latter two sites are now destroyed. Burnt mounds have been recorded on the coal measures (for instance 846, 808), and during limestone quarrying, several caves containing important archaeological deposits have been uncovered (654, 815).

Although several important sites of medieval date are known to exist in the study area (for instance see 642 and 1624) a more holistic approach to the historic landscape is more appropriate for this period and more recent times. This has been attempted for Carmel Woods (Murphy and James 1992). However, because of the more coherent nature of the man-made landscape and the wider area available for study, the coal measures often greater opportunity for this form of approach. Unfortunately no-one has yet attempted this type of study and the history and development of much the landscape remains relatively unknown.

7.2 Post-medieval industrial archaeology

7.2.1 Limestone quarrying and burning

Although lime was burnt in the Middle Ages for mortar (for example the lime kilns excavated at Carreg Cennen castle), there is general agreement that the use of lime as a fertiliser did not become common until the 16th century. However, the benefits of liming had been known previously to this as the following description from a medieval welsh manuscript of a primitive type of kiln demonstrates (Williams 1986, 117-8):

> Cut gorse, ferns, thorns, and underwood, in winter, where limestone is at hand; plough a ridge seven yards wide; place thereon a layer of fuel, then limestone, and so on alternately to the height of three yards; and make flues in the fuel in all directions, that the fire may pervade the whole heap. Then cover the kiln with sods, and upon those, clay or marl; then set fire to it, and when it is well kindled, stop the mouths of the flues, and let it burn until the fire breaks out through the clay or marl: then cover again, and so on, until the fire breaks out the third time, when it will have burned sufficiently: when cooled a little,

> open it, and carry the lime to where it is wanted. Bestow lime once in nine years upon arable land; and once in 18 years upon grass land.

A 1609 survey of the Duchy of Lancaster's lands in Wales records the burning of lime on Mynydd Mawr common (formerly part of the parishes of Llandybïe, Llanfihangel Aberbythych, Llanarthney, Llanddarog and Llannon parishes) as a well established tradition (Rees 1953, 300):

> wee saye that there are coales founde wrought and digged in the sayed common called Mynith Mawre the use whereof the sayed tenaunts of the sayed Commotte and theare auncestors and those whose estate they have severally have in and to theare sayd severall tenements by themselves and theare under tenants have severallye and respectively hadd for all the tyme whereof the memory of man ys not to the contrary for necessary ffyre and burninge of lyme as part of theire freehould and appurtenaunte to their sayd severall tenements.

In his late 16th century *Description of Pembrokeshire* George Owen noted that "lyminge hath been more used within these thirtie or fortie yeares than in times past". He also gives us an excellent description of the whole process of lime burning and of a kiln:

> this lymestone beinge digged in the quarey in great stones is heawen lesser to the biggnes of a mans fist & lesse, to the ende they might the sooner burne throwe, and beinge heawed smale the same is putt into a kill (kiln) made of wall sixe foote heighe fowre or five foote broade at the bryme but growing narower to the bottom havinge two lope holes in the bottome which they call the kill eyes, in this kill first is made a fier of Coales or rather colme which is but the dust of the coales which is laid in the bottome of the kill filled with these smale hewed peeces of lymestones, and then fier beinge geaven, the same burneth for the space of and maketh the lymestones to become meere red fierye coales which being don and the fier quenched the lyme so burned is suffered to coole in the kill and then is drawen throwe these kill eyes, and in this sorte is caried to the land where it is laied in heapes and the next showre of rayne maketh it to Molter and fall into dust which they spreade on the lande

Many of the kilns recorded in this survey are probably of the type described by George Owen. They vary considerably in size from about 1.5m in diameter up to over 5m in diameter. The form of construction also varies; some are clearly mainly stone-built, others seem to be mixture of stone and earth whilst others have little or no stone in their make-up. An example of this latter type was excavated by Ward (1983) at Cefn Bryn, Gower. Here the kiln comprised a penannular bank of earth and stone 3.8m in diameter, enclosing a 30 cm diameter bowl with a flue to the west. The spent fuel in the kiln consisted of cinder and coke with very small quantities of charcoal. Near to and associated with the kiln was a small, stone, rectangular structure, probably a storage shed and shelter. Artefacts from the kiln suggest that it was in use in the early decades of the 19th century. The author noted that documentary evidence indicates that this type

of kiln, as opposed to stone kilns, was something of an anachronism in Glamorgan by 1835.

Walter Davies writing in 1815 noted that kilns similar to those described above were still in use in several places in South Wales. They required rebuilding or repairing once a season. A new kiln was about two days work for a mason. He then describes a perpetual kiln that had first been introduced into South Wales in about 1775:

> the first of this kind in Glamorganshire was built of fire brick at Cardiff, its diameter at the top seven feet ten inches and a half; for two feet six in depth it was a perfect cylinder; for seven feet two inches more, it was an inverted section of a cone, the lower diameter being two feet three inches; it then became a cylinder again for two feet three inches more, which was the breath at the base of the pipe; the whole depth twelve feet.

In SE. Dyfed, up to the middle of the 19th century, limestone quarrying and burning seems to have been a small-scale undertaking carried out by freeholders and tenant farmers. Often one of the customary duties of a tenant was the provision of lime. A typical entry of 1648 in a series of rentals for the Golden Grove estate reads: `Thomas Walter - 2 capons, 2 hens, 2 loads of coale 2 of lime' (CRO Cawdor Vaughan 112/8399). Later a payment of one shilling was accepted in lieu of these duties. The assets of the large estates were carefully managed: in a 1734 lease (CRO Cawdor Vaughan 99/7895) of Carreg Gwenlais farm (Llanfihangel Aberbythych parish) the tenant was permitted to build two lime kilns provided `no waste or spoil shall be made by means of building the said kilns, carrying of lime stones or burning of lime' (the site of these two kilns seems to have been destroyed by recent quarrying) and in 1744 a yearly payment of one shilling was agreed for `the liberty of erecting a lime kiln and quarrying stones on that part of the Common called Great Mountain known by the name Castell y Carreg' (CRO Cawdor Vaughan 64/6618). Despite these controls exercised by the estates, there is evidence that freeholders and tenants built kilns and quarried limestone without permission. In 1755 on the Black Mountain `the homagers were engaged in secretly burning lime and selling it without the lord's licence' and a year later there were tenants `who are so audacious as to burn lime and sell it out of the lordships' (Jones 1963, 197 and 191). John Jones, a coalmaster from Brynamman, is said to have built a road, part of the wider system of turnpike roads, across the Black Mountain to serve the kilns on the northern fringes of the mountain in 1819 (Hughes 1990, 41). Even so, limestone quarrying and burning, up to the mid 19th century, seems to have been concentrated in the hands of freeholders and tenant farmers rather than industrial entrepreneurs. It is not therefore surprising that there are few detailed historical references to the industry apart from where it touches upon the affairs of large estates. Some kilns and quarries are shown on late 18th and early 19th century estate maps and on *c.*1840 tithe maps, but it is clear that the vast majority of kilns are not recorded on any maps nor mentioned in documents.

As mentioned above, the tithe survey of *c.*1840 depicts some kilns. All the sites of the kilns shown on these maps has been

examined. It is quite clear that the majority of the kilns depicted on tithe maps (where they survive) are small earth or earth and stone structures (type 2, below). None was a large stone-built structure (type 3, below) with a capacity over *c.*50 cubic metres, like, for example, kilns 27249, 27253 and 27256 in Carmel Woods. Indeed, almost all the kilns of this size came into existence between *c.*1840 and the survey for the 1st edition Ordnance Survey 1:2500 maps in 1876-9. Although the example dated 1815 noted below demonstrates that this type of kiln was in operation prior to this date. The documentary sources are silent on the building and operation of this type of kiln and it can only be assumed that they were constructed and run by local farmers, probably on a seasonal basis. Three kilns of this type with date stones were recorded in the survey: 27196 - dated 1815, 27249 - dated 1857 and 27319 - dated 1887. The only other dated example is the massive bank of kilns (25537) in Pentregwenlais Lime Works - dated 1903.

In 1856, the coming of the railway to Llandybïe caused a revolution in the lime production industry. Richard Penson, an architect noted for his ecclesiastical works, immediately realised the benefits that rail transport would have for the industry, for in that year he obtained the lease of Cilyrychen from the Dynevor estate with permission to build a lime works (CRO Dynevor 26/22). Lime had been burnt at Cilyrychen since at least the late 18th century. Penson began to transform the site. The first of his new kilns was lit on 6th June 1857 and the first engine arrived at it four days later. In 1858, though not complete, the kilns produced 8,306 tons of lime (Lewis 1945, 32-3). The style of the kilns attracted much local comment. In 1858 William Davies (p151) wrote: `Mr Penson, whilst he was allowing good taste its full swing, was doing nothing more than conforming to justly recognised principles, namely, not constructing an ornament, but merely ornamenting his construction.' The company, trading under the name Penson and Southern, continued to grow and further kilns were constructed. In 1906 the company merged with the Pentregwenlais Lime Company (see below) to form Lime Firms Ltd. Production from Cilyrychen in 1912 was 37,641 tons of lime and 52,491 tons of stone (CRO Derwydd CA28). Production in 1948 (Table 3) was 19,813 tons of lime, 15,393 tons of crushed stone, 11,030 tons of tarmacadam, 8054 tons of cube stone and 8128 tons of ground lime. Lime burning ceased in 1973, though the quarry still produces stone and other products.

In 1861, soon after the opening of Penson and Southern's lime works, Thomas Shepard Strick and Henry Richards of Brynamman Iron works obtained the lease to Pistyll, Llandybïe, with permission to build a lime works (CRO Dynevor 30/16). Lime had been produced on the site previous to this with, in the 1770s, David Thomas of Cilyrychen operating kilns, but Strick and Richards' works were on a far bigger scale and, as with Penson and Southern's works on the opposite side of the Cennen valley, they were connected to the mainline railway. Pistyll Lime Works does not seem to have been particularly successful and, according to Thomas (1975, 53), closed sometime in the last quarter of the 19th century. Plastic clay and silica sand were also exploited on the site. First in 1871 by John Howells, a Swansea millwright (CRO Dynevor 61/31). In 1902, Penson and Southern obtained the rights to further

develop silica deposits but they did not exercise them and the option passed on to The Carmarthenshire Silica Company (part of Bynea Steel Co. of Llanelli) in the same year (CRO Dynevor 73/9). The silica deposits proved to be disappointing and a higher quarry linked by a tramway had to be opened. Production ceased in 1927 (Thomas 1975, 53)

In 1900 a valuation was taken to extend a branch line (CRO Cawdor Vaughan 2/227) up to proposed lime works of enormous proportions. A date stone on the kilns indicates that the Pentregwenlais Lime Works, in Llandybïe and Llanfihangel Aberbythych parishes, were constructed by 1903. From the outset this new company seems to have run into financial difficulties: the bank of three massive kilns was clearly originally intended to be five, and in 1906 the company merged with Penson and Southern to form Lime Firms Ltd. In 1912 24,194 tons of lime were produced, 27,694 tons of road metal, 530 tons of limestone, 144 tons of ground lime, 989 tons of silica sand, 1200 tons of mortar and 2766 tons of silica road metal. Later in its life the works do not seem to have been working to full capacity. Table 3 below records that in 1948 only 15,535 tons of lime, 5768 tons of ground lime and 523 tons of mortar were produced. The works seem to have continued in production up into the early 1970s. In 1991 all the works apart from the kilns were demolished.

The history of the other major lime works in the study area, Mynydd-y-Gareg, Kidwelly, is apparently poorly documented. The only information relating to it discovered in the course of this study comes from printed maps. These works comprised two large banks of kilns, the lower set served by tramways and a mainline railway. The works had closed by 1907, but Table 3 shows that the kilns must have been re-opened for in 1948 9830 tons of lime were produced. The works are now demolished.

Despite the centralisation of the industry from the middle of the 19th century in a few very large lime works, smaller kilns and quarries continued in production. The 1876-9 survey for the Ordnance Survey 1:2500 maps records most of the stone-built kilns (and that is the majority of kilns then recorded) as working. On the revised maps of 1906-7 the majority of kilns are shown disused. There are exceptions to this; on the first edition map a kiln (23189) at the edge of Carmel Woods, Llanfihangel Aberbythych parish, is shown disused. In 1906, not only was it working but a short length of tramway had been built to supply the kiln with stone from a quarry to the south. In 1892, at Garnbica and Garnfach, Llandybïe, the Dynevor estate granted permission to Evan Jones to re-open the old quarries and erect a lime kiln (CRO Dynevor 36/9). The granting of this permission was opposed by Penson and Southern - they stated that there was already over production in the industry. In a letter dated 1937, Mr Davies of Maerdy Farm produced 144 tons of lime at Garnfach in the half year up to December, and in the same letter to the Dynevor estate (CRO Dynevor 122/22), it is also stated that he intends to rent and use the old kilns there. Other 20th century examples of local farmers responding to market forces and re-opening lime kilns for small-scale production can be found in documentary and other sources. For example, in 1939, at Pwll-y-March, Llanfihangel Aberbythych, the farmer, Mr Wilkins, was clearing out an old kiln

(27245) with the intention of re-starting lime production. This was stopped, as Wilkins had no rights over the kiln (CRO Cawdor 2/234 117). He seems to have continued with the quarrying for in 1944 Pwll-y-March produced eight tons of limestone (CRO CAC/PL/10). Permission must have been obtained to use the kilns as in 1948 (Table 3) Wilkins and Wilkins produced 5657 tons of lime and 1215 tons of stone.

Twenty-nine quarries operated in the study area in 1948 (Table 3). Of these, 16 burnt lime (ground lime was produced in three quarries) and four were silica or silica sand quarries. The main product was stone.

Oral testimony indicates that some kilns, such as 27574, produced lime up into the 1960s. Those operated by Lime Firms Ltd continued in use up into the 1970s.

Today there are just seven working quarries in the study area (Table 1). Five producing limestone and related products, two working silica deposits. None is engaged in the burning of lime.

Typology of Lime kilns

It is not the intention of this study to produce a typology of kilns. However, the following may serve as a rough guide to the types of kiln found in SE. Dyfed:

1. Sod kiln. As described above in Williams (1986). The very nature of this kiln mitigates against its survival, though it is considered possible that several linear earth mounds on Banc Wern-Wgan (3306) may be the remains of this type of kiln.

2. Flare kiln. So called because the fire is allowed to die down before the lime is extracted. Several hundred examples of this type of kiln were identified in the course of the survey. Date range from the 16th century up to the beginning of the 19th century. Three basic types were recognised: i) Built of earth and stone - see above description by George Owen - on flat or gently sloping ground. They survive as penannular earthworks, indicating a single drawing hole. They range in diameter from 1.5m to 5m and may stand up to 3m high as earthworks. They are very common in the E. part of the study area, but were rarely encountered W. of Mynydd Llangyndeyrn. It is likely that the kiln excavated by Ward (1983) at Cefn Bryn, Gower was an eroded example of this type of kiln rather than a sod kiln as interpreted by the author. ii) Similar to the above but built into a steep natural bank. This allows for a deeper kiln pot with the kiln mouth at upper ground level for ease of charging. Single drawing hole. Similar distribution as i. iii) Similar to ii, built into a high bank, but with two drawing holes on opposite sides of the kiln. This type of kiln seems to have a restricted distribution around Dyllgoed, Foel-Gastell and Mynydd Cerrig (Maps 11-13).

3. Draw Kiln or perpetual kiln. The design of these kilns permitted them to be used continiously, although in practice

the smaller kilns were probably allowed to cool prior to the removal of the burnt lime. Stone-built, often built into a natural bank below the quarry face or otherwise making use of local topography and usually with a charging hole flush with the quarry floor for ease of loading. The most common form is with a single drawing hole facing down slope, though twin drawing hole arches side-by-side are not unusual. Examples with two drawing holes on opposite sides of a kiln also occur. The shape of the drawing hole arch seems to vary according to local tradition. There are as many different variations of form of this kiln as there are kilns. They often occur in pairs or in banks of several kilns. They have a very wide size range from just over 3m in height up to the massive kilns at Pentregwenlais Lime Works. This type of kiln is found all over the limestone though is rare on the high ground of the Black Mountain. According to Davies (1815) this type of kiln was introduced into S. Wales in about 1775. Building of them continued into the early years of the 20th century and some were still in use into the 1960s and 70s. From field remains, it is often not possible to distinguish between large examples flare kilns and smaller draw kilns.

Note: there are no examples in SE. Dyfed of the Hoffman kiln or any of the many designs of vertical and rotating kiln described by Searle (1935, 280-324).

Table 2 Dimensions and capacities of selected lime kilns.

16304	late 19th	a10.00	e3.40	-	1	5	e68.08	e308.80
-	late 19th	a10.00	3.40	-	1	5	a68.08	-
-	mid 19th	a10.00	3.20	-	1	5	a60.31	-
-	late 19th	a9.00	3.40	-	1	5	a61.27	-
-	late 19th	a7.50	3.40	-	1	5	a51.06	-
27160	pre 1839	5.00	4.00	10.00	1	1	47.12	
27162	mid 19th	a5.30	e6.90	a13.00	2	1	e148.62	
27165	mid 19th	6.00	6.20	10.50	2	1	132.84	
27167	mid 19th	7.50	6.30	17.60	1	1	175.33	
27177	early 19th	3.30	2.50	?	1	1	12.90	
27221	mid 19th	8.50	e4.16	11.9	1	2	e86.70	e170.3
-	-	8.50	e4.09	11.7	1	2	e83.60	-
27245	mid 19th	6.50	e7.00	20.00	2	2	e187.63	e313.61
-	-	6.50	e5.70	16.50	1	2	e125.98	-
27249	1857	5.80	5.50	a16.50	1	1	103.34	
27253	mid 19th	4.70	4.60	12.00	1	1	58.58	
27256	mid 19th	4.60	4.7	a11.00	2	1	59.86	
27519	mid 19th	4.90	3.00	a10.50	1	1	25.97	
27520	mid 19th	5.10	3.00	10.40	1	1	27.03	

The cubic capacity of a kiln is estimated using the formula: volume = $0.75\pi d^2 h \div 4$; d = diameter of the kiln-mouth and h = the kiln height. Where infilled the diameter of a kiln-mouth is estimated at 0.35 of the front of the kiln if free standing and 0.535 on kiln built into a high bank. a = approximate and e = estimated. This formula is from Bick (1984).

Table 3. List of working quarries in 1948 in the study area (CRO CAC/PL/10)

Quarry	Product	Tonnage
BLAENYFAN Llangyndeyrn	Cubes	31601
CAPEL Llanarthney	Tarmacadam Crushed stone Cubes	2453 4751 124
DANYLAN Llanddarog	Silica	715
GWARALLT Llanddarog	Silica	3849
DYLLGOED Llanarthney	Crushed stone Cubes	6456 1891
TORCOED Llangyndeyrn	Crushed stone Cubes	34799 4752
GARNBICA Llanddarog	Lime Crushed stone Cubes	4085 182 498
TORCOEDFAWR Llangyndeyrn	Lime Crushed stone	4395 800
TYGWYN Llangyndeyrn	Lime Cubes	1756 664
TY'R GARN Llanddarog	Lime	1443
VAN I Llangyndeyrn	Lime Cubes	3426 1032
VAN II Llangyndeyrn	Cubes	10072
MAESYMEILLION Llangyndeyrn	Lime	1922
PENYBANK Llangyndeyrn	Lime Cubes	1613 1686
BLACK MARBLE Llanddarog	Lime Cubes	6132 2162
GARNSTONE Llanddarog	Silica	5305

LAN Llangyndeyrn	Crushed stone Tarmacadam Cubes Ground lime	8026 8910 2731 1888
LIME KILNS Kidwelly	Lime	9830
ALLT-Y-GARN Llanfihangel Aberbythych	Clay Cubes	498 148
BLACK MOUNTAIN Llangadog	Lime	
BLACK MOUNTAIN Quarter Bach	Silica Sand	1123 567
BLACK MOUNTAIN Llangadog	Lime Cubes	1977 2368
CINCOED Llandeilofawr	Crushed stone Cubes Lime Tarmacadam	19723 1100 877 1571
CILYRYCHEN Llandybïe	Lime Crushed stone Tarmacadam Cubes Ground lime	19813 15393 11030 8054 8128
GLANGWENLAIS Llandybïe and Llanfihangel Aberbythych	Lime Ground lime Mortar	15535 5768 523
GARNFACH Llandybïe	Cubes	1196
CARREG LAS Llandeilofawr	Silica	2492
PWLL-Y-MARCH Llanfihangel Aberbythych	Lime Cubes	5657 1215
LLWYNYFRAN Llanfihangel Aberbythych	Crushed stone Tarmacadam	4845 7331

7.2.2 Coal mining

It is beyond the scope of this short survey to provide a exhaustive study of the coal mining industry for the area under examination here. It is, however, desirable to provide a basic framework to provide a context for the sites recorded during the course of this survey.

A useful study charting the historical development of the anthracite coal mining industry in the E. part of the study area was compiled by Morgan (1958) for an undergraduate dissertation. Although he concerned himself with the industry from the Glamorgan border to the W. as far as Penygroes (see Map 23), his general model of development is applicable for the whole of the area of the anthracite coalfield under consideration here. Morgan identified four periods of development:

i. Early period up to 1830. The industry is mainly wedded to agriculture. Simple workings of shallow shafts or slants often sited near to farms - see remains on Map 23 - or on marginal land such as Mynydd Mawr and Mynydd Betws.

ii. Developmental phase, 1830 to 1923. An initial phase spurred by the building of the railway in the Amman valley in 1835 and subsequent branch lines and opening of iron works and tinplate works. A second phase from 1870 caused by the opening of markets across Europe.

iii. Period of amalgamation, 1923-47. The period of maximum production for anthracite with 80% of output in the Amman valley area controlled by one company.

iv. Period of decline from 1947.

It is not now an easy task to identify early coal workings on field evidence alone. A combined study of field evidence and documentary and map research needs to be undertaken. It is, however, likely that the vast majority of coal mining surface remains will date from the late 19th and 20th centuries. There are exceptions to this. For instance, Thomas (1894, 17-21) provides us with a description of Brynlloi colliery, Betws. He states that it was working as early as 1757 and was serviced by an underground canal. This site lies outside the current detailed study areas. However, at Glasbury and Syddyn Melyn (Map 19) an early colliery site (11093) was recognised on the ground. This is the site of Kymer's colliery. The position of several shafts are recorded on an estate map of 1762 (CRO Dynevor map drawer 3, 19) and there is a wealth of 18th century documentation related to the colliery in the Dynevor collection of documents. It was first served by a canal and later a by railway. Some of the remains of this operation were recorded by the Ordnance Survey, but a sketch map (Fig. 1) shows the full surviving extent of the mine.

Several collieries of late 19th- and 20th century date lie within the detailed study areas - 23440 (Map 20); 16821, 27222, 27226 (Map 22); 27742, 27696 (Map 23); 7679 (Map 25) and 5504 (Map 27). These are described in the catalogue.

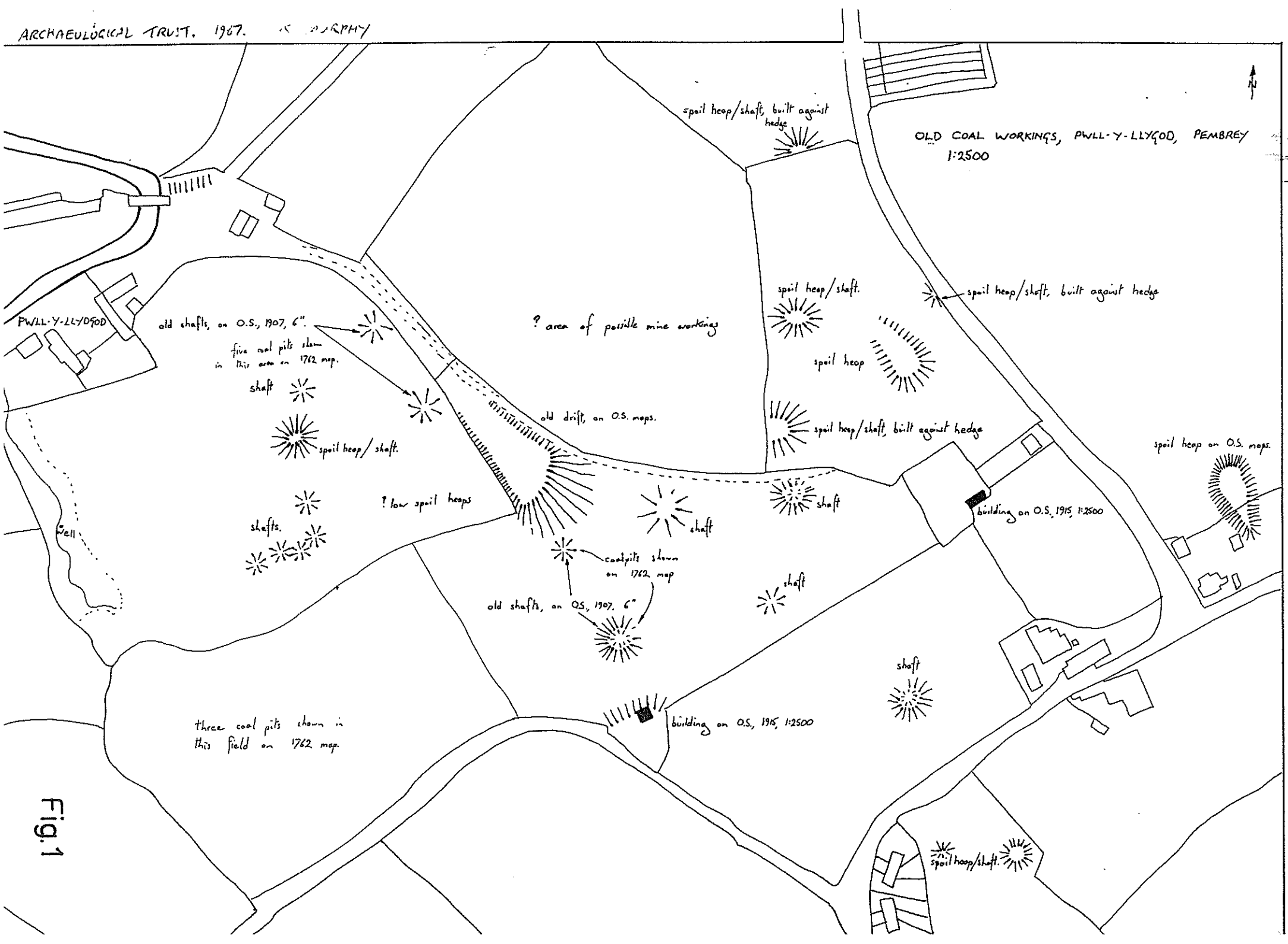
ARCHAEOLOGICAL TRUST. 1967. K MURPHY
OLD COAL WORKINGS, PWLL-Y-LLYGOD, PEMBREY
1:2500
N
spoil heap/shaft, built against hedge
PWLL-Y-LLYDOD
old shafts, on O.S., 1907, 6".
five coal pits shown in this area on 1762 map.
shaft
spoil heap/shaft.
? area of possible mine workings
old drift, on O.S. maps.
spoil heap/shaft.
spoil heap
spoil heap/shaft, built against hedge
spoil heap/shaft, built against hedge
spoil heap on O.S. maps.
? low spoil heaps
shafts.
well
shaft
shaft
building on O.S. 1915, 1:2500
coalpits shown on 1762 map
old shafts, on O.S., 1907, 6"
shaft
shaft
three coal pits shown in this field on 1762 map.
building on O.S., 1915, 1:2500
spoil heap/shaft.

Fig.1

11093

8 DETAILED STUDY AREAS (Map 3)

Because of problems of overcrowding it has not been possible to reproduce every individual record number on the detailed study area maps (Maps 4-27). To ascertain the location of a particular site it may be necessary to refer to the catalogue (section 11) where full grid references are provided.

8.1 Limestone and Gritstone (silica)

8.1.1 The Black Mountain (Map 4)

Sites in catalogue: 4592, 19213, 24458, 24461, 27383-27410, 27606-31. These are lime kiln and limestone quarrying sites only - other sites are not included.

Current status: There are no threats in this area. All the land lies within the Brecon Beacons National Park.

Description: A large tract of open moorland rising from the edge of the enclosed land at *c.* 250m along its northern fringes to over 600m in the central area. A belt of Carboniferous limestone along the northern edge of the study area has produced a craggy broken landscape. Elsewhere, over millstone grit, the Black Mountain is more rounded with blanket peat cover on the higher ground.

Archaeology: This area was not examined in the field. The sites listed in the catalogue and shown on the accompanying map are taken from DAT's SMR and from data collected during the National Archaeological Survey undertaken in the 1980s (this information is housed in the NMR, RCAHMW, Aberystwyth). No information apart from that concerned with limestone quarrying and lime burning is listed or shown on the map.

There are extensive remains of the former limestone quarrying and burning industry on the Black Mountain. Most of these remains lie on the northern fringes of common land, though an outlying area of limestone around Foel Fraith was also exploited. It is only in this latter area that individual kilns were plotted by the NAS. Elsewhere, the approximate boundaries of the lime working complexes are shown; the positions of individual kilns are taken from printed map sources and have not been assigned PRN numbers.

8.1.2 Llygad Llwchwr (Map 5)

Sites in catalogue: 3306, 3432, 4000, 4003, 4006-07, 4009-10, 4865, 8095-99, 9858-59, 13132, 13133, 18359, 18361, 24369 27478-87, 27598-604,

Current status: This area lies within the Brecon Beacons National Park and there are no threats to the sites.

Description: Only the extreme western part of this area, around Llygad Llwchwr, was examined on the ground. Most of this area is characterised by open moorland, though there is some improved pasture and tree cover the on lower ground around the source of

the Llwchwr.

Archaeology: The main areas of interest are the lime workings on Banc Wern-Wgan, 3306, and the pillow mounds on Beddau'r Derwyddon. Between Llygad Llwchwr and Beddau'r Derwyddon several previously unknown earthwork sites were identified. These were difficult to classify but may be associated with the pillow mounds on Beddau'r Derwyddon.

8.1.3 Cincoed and Careg Dwfn (Map 6)

Sites in catalogue: 825, 829, 4004, 6902, 13358, 18349-50, 24702, 27100, 27112-13, 27123, 27411-75, 27488-89, 27491-96, 27790

Current status: Craig-yr-odyn quarry is active. See map for consent area.

Description: An area approximately 2.5km by 1km. The Carboniferous limestone is confined to a narrow band only about 200m wide running E.-W. The limestone achieves a height in excess of over 250m and is craggy in nature. The steep N.-facing slopes of the limestone at the E. end of this area are covered by well-managed coppice woods. Elsewhere, and where not quarried, the predominant vegetation over the limestone is rough pasture and moorland over the millstone grit.

Archaeology: Cincoed Lime Works (27444), now closed, has quarried away the eastern end of the limestone ridge whilst the still working Craig-y-Odyn quarry has exploited most of the limestone reserves shown in its consent area. Between these two large quarries and to the east of Craig-y-Odyn are traces of earlier exploitation of the limestone in the form of numerous small kilns and quarries. These probably date to the 18th and early 19th centuries. Cincoed Lime Works still retains part of its crushing mills and ancillary plant as well as stone-built lime kilns.

The gritstone of this area is dominated by the exposed, treeless hill of Careg Dwfn which rises to over 275m. The fringes of this hill have seen some exploitation of silica deposits. Prehistoric sites were previously known in this area (825). The survey identified a ring-barrow (27421) and two possible round barrows (27491, 27493). Settlements, probably of post-medieval date were also identified (27416, 27419).

8.1.4 Pistyll and Y Garn (Map 7)

Sites in catalogue: 10246, 13384, 27110-11, 27118-120, 27126, 27291-305, 27307-18, 27320-26, 27329-35, 27340-52, 27356-76, 27379-82, 27696-7, 27715

Current status: Garnbica quarry has current consent for quarrying. At the moment is used as a refuse tip.

Description: The S. side of this area is dominated by treeless moorland on gritstone. The N side is more varied with fields of pasture interspersed with limestone outcrops. The areas immedia-

tely around Garnbica and Pistyll quarries are heavily wooded.

Archaeology: Three earthwork sites (27340-42), possibly round barrows, were identified on the northern edge of the survey area. Numerous lime kilns were also identified. Most of these consisted of penannular earthworks (type 2i). The most dramatic site in the study area is Pistyll Lime Works (27497). Here, a massive bank of unusual kilns straddles a railway. The kilns were later modified to accommodate the crushing mill for a silica works.

8.1.5 Cilyrychen (Map 8)

Sites in catalogue: 4856, 4858, 4869, 7521-2, 27791-96

Current status: Active quarry. Reserves almost exhausted.

Description: This hill of limestone rises from the flood plain of the Afon Cennen at 64m up to a maximum height of about 190m. Where not quarried, the flanks of the hill are heavily wooded which give way to improved pasture on the lower slopes. The core of the hill has now been removed by Cilyrchen quarry.

Archaeology: Prehistoric finds (7521-2) were discovered during quarrying and formerly a hill fort was situated on the highest point; quarrying has removed this. The most important surviving archaeological remains in the area are the splendid lime kilns (27792). Construction of these began in 1856 and further ones were added in the late 19th or early 20th century. They are listed buildings.

8.1.6 Carmel Woods (Map 9)

Sites in catalogue: 258, 654, 790, 815, 818, 1028, 7523, 13127, 11250, 16917, 18263, 23189, 24024, 24043, 25467, 25502, 25531, 27132-69, 27242-90.

Current status: The consent area of Pwll-y-March quarry lies on the N fringes of the limestone. Virtually all the remainder of the limestone ridge and millstone grit is currently the subject of a public enquiry to establish the extent of the Glangwenlais Interim Development Order (IDO).

Description: An area approximately 2km by 1km. Here, the Carboniferous Limestone forms a ridge between 400 and 500m wide running WSW. to ENE. This ridge comprises a series of low cliffs. These are generally N.-facing but with some E.- and W.-facing ones along fault lines. The ridge attains a height of over 240m. It is heavily wooded. This woodland has been demonstrated to be ancient with many features consistent with management in the historic period. The woodland has been designated a SSSI.

The gritstone forms a parallel ridge to the S of the limestone. It is of slightly lower elevation and is treeless. The predominant vegetation is bracken. Until its enclosure in the early 19th century the gritstone in this area formed part of Mynydd Mawr Common.

Archaeology: Apart from ring-barrow (258), a holy well called Llygad gwenlais (790, 7523) and finds of the Prehistoric and Roman Periods from caves made during quarrying (654, 815), most of the archaeological remains in this area are associated with the lime burning industry. Scattered throughout the woods are numerous remains of pre- and early 19th century kilns and quarries. Interspersed with these are several mid-19th century stone-built kilns including an example dated 1857 (27249) and a fine group called Garn (27159-60, 27162, 27165, 27167) at the western end of the limestone ridge. The most impressive remains are those associated with Pentregwenlais Lime Works, (1028) All the ancillary buildings of these works were demolished in 1991. The bank of three massive kilns dated 1903 survives and is now a listed buildings.

8.1.7 Allt-y-Garn and Llwyn-y-Fran (Map 10)

Sites in catalogue: 657-59, 24038-39, 24073, 27104, 27106, 27498-509, 27548-70, 27632-50, 27690-93, 28309.

Current status: Allt-y-Garn is a working quarry. Llwyn-y-Fran has consent but is not active. Crosshands is inactive.

Description: The limestone belt falls away west of Carmel Woods to less than 200m, before rising again to 240m further west at Llwynyfran quarry. The intervening block, east of Pwll-edrychiad, is characterised by improved pasture and small parcels of woodland which often mask the outcropping limestone. The quarry at Llwynyfran is fringed by dense scrub and small parcels of woodland, especially on its southern side, though it is surrounded by pasture.

The millstone grit ridge of Allt-y-Garn forms a prominent topographical feature, rising to 240m. Allt-y-Garn is treeless and its characteristic vegetation is bracken, gorse and heather, which is often quite thick and makes fieldwalking difficult.

The gritstone and limestone seem to lie very close together at this point. The limestone band is quite narrow, between 300m and 400m wide, bounded to the north by a ridge of Devonian strata upon which the village of Carmel is situated.

Archaeology: There are three hilltop cairns (657-59) on the millstone grit ridge of Allt-y-Garn with a possible further round barrow (257) to the E. Along the ridge to the N. of Llyn Llech Owen a some of the several newly discovered earthworks may also be bronze age burial mounds.

Many sites related to the burning of lime were recorded in the survey. Note the concentration of type 2 kilns to the SE. of Pwll-edrychiad farm and later stone built kilns around Llwyn-y-Fran and Dyllgoed. It is worth noting that at both the latter named quarries, the presence of large lime burning spoil tips around the edges of the quarry seems to indicate that some kilns have been destroyed by quarrying activity. The nature and date of such kilns can only be guessed at, but with both quarries having

been worked during the mid-20th century, it seems reasonable to assume that they would have dated to the early 20th or 19th centuries.

8.1.8 Dyllgoed (Map 11)

Sites in catalogue: 257, 643, 647, 650, 10837, 13321-26, 16919, 22084, 22090, 22105, 24037, 27651-83, 27685-94, 27788-89, 28291-305, 28307-08.

Current status: Capel quarry has consent for quarrying, but is not currently working. Dyllgoed is owned by Dinefwr District Council and is currently used as a rubbish tip.

Description: The limestone belt, west of Llwynyfran, falls gradually from 240m, reaching 170m at Capel Quarry some 1km distant. The limestone outcrop is only 300m to 400m wide here, characterised by good pasture land, interspersed with small blocks of woodland, within which lie numerous small quarries, such as those at Blaen-y-pant, Banc-yr-odyn and Dyllgoed-isaf, along with the more substantial quarries of Dyllgoed and Capel.

The Millstone Grit continues to be a more prominent feature, maintaining an altitude of up to 240m along Banc-y-Llyn. A large section of the gritstone ridge between the B4297 and Llyn Llech Owen is now afforested. The area immediately west of the B4297 is also obscured by dense gorse cover, making fieldwalking impossible over much of the ridge.

Archaeology: Remains associated with the burning of lime comprise the main areas of archaeological interest. Of particular interest are three stone-built kilns of unusual design (27693, 27788-89). Lime was produced for a short time at Dyllgoed during the 1939-45 War, when one kiln was re-opened (27662). The now derelict Friendship corn mill (16919) is believed locally to have been founded by the co-operative movement of Robert Owen of Newtown. It is said that a row of worker's cottages was built near the mill, though there is no physical evidence for such buildings.

Along the millstone grit ridge, near Llyn Llech Owen, a number of small earthwork features were observed, some of which may be hut platforms of unknown date. The abandoned cottage of Gareg-lwyd (27683) displays some interesting features, including a wattle roof frame supporting an almost intact thatched roof.

8.1.9 Foel-Gastell and Danylan (Map 12)

Sites in catalogue:643, 4730, 4732, 6761, 10826, 10843, 10859-61, 11984, 16803, 24164, 27594-97, 27695, 27698-712, 27713-15, 27721, 27861-63, 28317-18

Current status: Danylan, Castle and Pen-y-Foel quarries have consent for quarrying. None are presently active, though Danylan had been worked just prior to January 1994.

Description: West of Capel Quarry, the limestone belt is inter-

rupted by faulting, resulting in a large block of limestone being pushed up to 0.5km northwards between the Tumble and Bryngwili faults. The belt resumes its course near Foel-gastell, where it dips steadily down to Banc-y-Mansel, falling from 160m to 70m in altitude. The terrain is characterised by a typical mixture of pasture and small woods, along with more craggy scenery near the outcrops which have been exploited by quarrying at Castle Quarry. The disused quarries are generally obscured by thick scrub vegetation and woodland.

The millstone grit ridge is again a more prominent topographical feature, reaching nearly 200m immediately west of Foel-gastell village, falling to 90m some 2km to the west at Danylan quarry. The eastern end of the ridge here is characteristically treeless and bracken covered, though moving west there are a series of small blocks of woodland. The whole of the western end of the ridge above Danylan Quarry is thickly wooded. The south facing side of the ridge is now improved pasture.

Archaeology: Prehistoric sites in this area comprise a ring-barrow (11984), a possible round barrow (4733) and a possible standing stone (10843). Capel-erbach (646) is a medieval well chapel.

Industrial sites, mainly lime kilns, cluster around Castle quarry. The surviving kilns here are mostly stone built, though few are in good condition. Several earth built kilns (Type 2i) survive at the western end of the quarry, suggesting that lime was being burnt here before the stone kilns were constructed. Along the millstone grit quarrying activity is evident near Pen-y-Foel Farm (28317) at the eastern end of the ridge, as well as above Cwm-per, Banc-y-Mansel, the site of a small, 19th century silica crushing mill linked to a quarry by a tramway (27594-96). At the western end of the ridge is the working quarry at Danylan (28318)

8.1.10 Mynydd Cerrig and Maesdulais (Map 13)

Sites in catalogue: 632-35, 638-39, 9952, 10722, 16354, 16822, 17902, 22001, 22019, 22029, 22118-19, 24165-66, 27172-76, 27319, 27547, 27571-93, 27716-21, 27766-69, 27771-78, 27797-98, 27800-60, 28313.

Current status: Maesdulais, Garnbica, Ty'r Garn and Garn quarries have consent for quarrying. None is currently working.

Description: West of Banc-y-Mansel the limestone belt once again becomes a prominent landscape feature, especially when viewed from the north. Between Maesdulais and Torcoed Quarries the limestone reaches up to 160m. The landscape is characterised by a patchwork of small fields broken up by small parcels of woodland. The steep northern side of the ridge is characterised by a line of almost unbroken woodland.

The millstone grit belt again is slightly more prominent than the limestone, reaching up to 200m on Mynydd Cerrig itself, though it is not particularly prominent between here and Banc-y-Mansel to the E., only gradually recovering altitude as it proceeds west-

ward. Between Banc-y-Mansel and Mynydd Cerrig, the gritstone landscape is of pasture and woodland, whereas Mynydd Cerrig itself is mostly treeless (apart for a parcel of woodland above Garn-bwll), characterised by a covering of bracken and gorse and is quite rugged at its highest points.

Archaeology: Four previously recorded prehistoric burnt mounds (632-35) are situated in this area of interest. Identified in the course of this survey was a possible round barrow (27775). However, the greatest archaeological interest is provided by the large number of lime kilns, most of which lie along the foot of the slope on the N. edge of the limestone. It is on this side that the greatest concentration of quarries and kilns are found, with each of the following properties owning a block of well exploited limestone ridge; Maesdulais (Garnbica), Llawrcwrt, Garn Farm, Garn-ffrwd, Ty'r Garn and Garn-Bwll. The majority of these kilns are of type 2 - earth and stone built. There are also a significant number of stone-built kilns present. Of particular note are kilns 27319 and 27571. The kiln 27574 at Ty'r Garn quarry was one of the last productive kiln in Carmarthenshire; it was apparently still in use at the time of the 1964 1:2500 map.

The are several small quarries in the gritstone in the eastern part of the section, though it is only at Garnbica Silica Quarry at the westernmost end that substantial quarrying has been carried out.

8.1.11 Mynydd Llangyndeyrn (Map 14)

Sites in catalogue: 1693-95, 1697-99, 7710-17, 8773, 10707, 10744, 11586, 16357, 16359-60, 22196-97, 23650-52, 23684, 27115-16, 27170-01, 27177-80, 27208-09, 27211-14, 27218-22, 27224-25, 27216-17, 27223-25, 27306, 2786-69, 27896-99, 28281-83, 28285.

Current status: Torcoed is a working limestone quarry, its consent area has just been extended. Torcoedfawr is also a working limestone quarry. Crwbin is currently an inactive limestone quarry but with consent.

Description: Two parallel ridges of entirely different nature characterise this area. The S. ridge - known as Mynydd Llangyndeyrn - is comprised of millstone grit and is covered by treeless dry heath with a high bracken content. The land is unenclosed and attains a maximum height of over 250m. The N ridge is composed of Carboniferous limestone. It is craggy in nature with ancient woodland on its steep N facing slopes and enclosures of improved pasture on flatter ground. The central spine of this limestone has been virtually removed by quarrying. Modern settlements form a loose girdle around the foot of these ridges though cottages, now mostly abandoned, have been established in the high valley between them.

Archaeology: The millstone grit ridge of Mynydd Llangyndeyrn possesses a fine and important collection of neolithic and bronze age monuments (1693-95, 1697-99, 7710-17). These have been studied and described elsewhere (Ward 1976, 1983, 1989). Other sites of interest are a field system (27212), possibly of some an-

tiquity, and a potential holy well site (22197). Monuments associated with the limestone extraction and burning industry seem to have been concentrated along the N. fringes of the limestone. There is documentary evidence for a late 18th century kiln near to Ffynnon Gydychog. This kiln (27115) survives, but many later ones, including all but two of the many in Crwbin quarry first recorded on the tithe survey, have been destroyed by recent quarrying.

8.1.12 Limestone Hill (Map 15)

Sites in catalogue: 1700, 8459-60, 10704, 23666, 27103, 27187-88, 27190-201, 27871-2, 27873, 27875-88, 27890-91, 27895, 28284-85, 28310-11, 28314

Current status: There is a consent area for limestone quarrying on Limestone Hill. There was no active quarrying in January 1994.

Description: An outlying hill of limestone which has experienced much quarrying on its steep and craggy N. and W. flanks. The areas of old quarries and the summit of the hill are heavily wooded. The less steep S. and E. slopes have small patches of woodland set amongst fields.

Archaeology: Capel Dyddgen (1700) lies at the foot of Limestone Hill outside the area of quarries and consent. On the summit of the hill are the remains of an iron age promontory fort (8459). At least part of this site lies within the consent area. Around the foot of the hill lie a series of lime kilns most of which are in good condition and of early - mid 19th century date, one (27196) is dated 1815.

8.1.13 Blaenyfan and Four Roads (Map 16)

Sites in catalogue: 10729, 16305-06, 16347, 16368-69, 23643-44, 23678-81, 25022, 27202-07, 27226-39, 27539-42, 27546, 28286-87, 28289-90, 28315-16, 28319.

Status: Blaenyfan is a working quarry with a recently extended area of consent.

Description: Blaenyfan is an isolated outcrop of limestone, c.500m x 500m in area and is quite a prominent local feature, reaching an altitude of up to 180m. As a working quarry, most of the area is inaccessible. There are remnants of earlier quarries and kilns to be seen at the northern and eastern edge of the block, however, mostly in small patches of scrub or woodland. There seem to be few outcrops of limestone to the NE. and SW. of Blaenyfan where the land is mostly used as pasture. One kilometre to the SW. there lies another block of mixed pasture and woodland near the village of Pedair Heol/Four Roads where the limestone again outcrops, altitude c.150m. This was not visited.

To the SW. of Mynydd Llangyndeyrn the millstone grit does not outcrop for some 2.5km, hidden in the main by improved pasture land and small parcels of woodland. It again appears SW. of the

village of Meinciau. Along this whole section, the millstone grit maintains an altitude of nearly 200m, remaining the dominant landscape feature.

Archaeology: 10729 is the site of a possible round barrow. The other remains in this area are mainly associated with limestone burning. Most of the kilns which girdle Blaenyfan quarry have been destroyed or are badly damaged. Other kilns are known to exist around Four Roads. This area was not examined on the ground; it is likely that more kilns exist than are shown on the map.

8.12 Mynydd-y-Garreg (Map 17)

Sites in catalogue: 16310, 16312, 16315, 23676, 23683, 23704, 27510-14, 27516-36, 27538-40, 27543-44, 27784-7

Status: There is a large consent area on Mynydd-y-Garreg for silica stone extraction. No quarries were active in March 1994, though several had been worked within the past few years.

Description: There has been much recent ribbon development on the roads either side of the S. end Mynydd-y-Garreg which gives a slightly suburban feel to the area. The central area is dominated by treeless moorland. This has been subjected to extensive quarrying. The limestone is confined to a narrow belt along the NW fringe of Mynydd-y-Garreg. The S. end of the limestone is built upon, the N. end contains pasture with occasional stands of trees.

Archaeology: There are no known prehistoric monuments on Mynydd-y-Garreg. The two large sets of lime kilns (16313, 27511) associated with Mynydd-y-Gareg Lime Works (27510) are now demolished and the land restored. Only the lime works' quarries and the course of a tramway (27514) survive. The tramway supplied a brickworks (23683), now demolished, and a further set of lime kilns (16304) near Four Roads. This bank of five large kilns is of late 19th century and survives in very good condition.

8.2 The Coal Measures

8.2.1 Glanstony (Map 18)

Sites in catalogue: 1624, 1638, 5648, 10967, 13241, 13369, 23853, 24349, 24634, 24636, 28320-33.

Current status: Classified as `Undergoing investigation' by British Coal. Many of the farms have been purchased by British Coal. Most of the farm buildings have been demolished and the land is not now farmed.

Description: This area is bordered on its south-eastern side by a relatively steep, afforested escarpment which rises to c.180m. Coal Measures outcrop along this escarpment, explaining the series of small coal quarries and shafts (28332) located near the

farmhouse of Bryndias (28331). Coal measures come to the surface at several other locations within the study area, though the solid geology is largely masked by boulder clay deposits, with pockets of sand and gravel. The land falls away gradually to the north-west, altitude decreasing to only 5m along the marshes to the west. There are a few small parcels of woodland scattered across the area, the largest being just east of Wern Farm (24634). Most of the area covered during fieldwork was apparently abandoned agricultural land, unimproved for several years and therefore often covered by scrub. The poor drainage of the area has also resulted in many of these fields becoming waterlogged and rush growth was widespread. The land to the N. and W. was generally better and still productive farmland.

Archaeology: The landscape history of this very large area of proposed open cast is unknown. Two sites are of particular interest here: 1624 and 1638 are both iron age defended enclosures. 28323, a low earthwork mound discovered in the course of this survey, may be a bronze age round barrow.

8.2.2 Glasbury and Syddyn Melyn (Map 19)

Sites in Catalogue: 5333, 5777, 8822, 11093, 16319-20, 17331, 23710, 24539, 24540-46, 24632-33, 24637

Current status: In 1987, the area to the NE. of the B4308 was classified as `Undergoing Investigation' by British Coal. All this land has been purchased by British Coal and is not now farmed nor are the farmhouses occupied. This area does not now feature in British Coal's current development programme.

Description: A low lying tract of land on the S. side of the Gwendraeth Fawr. The N. portion of the area is pasture, most of the S. part is under a woodland plantation. There are four dispersed farms within the area of interest, all are now abandoned.

Archaeology: Externally, the farm buildings are of 18th - 19th century date. A limited amount of recording has been made of them. Of some interest is site 11093, old coal working. Though working up into the late 19th early 20th century this is the site of Kymer's coal mine of mid to late 18th century date. A canal (5777) served the mine, later replaced by a railway.

8.2.3 Dan-y-Banc (Map 20)

Sites in catalogue: 5785, 7334, 11151-53, 13136-37, 13186, 13188, 13361, 16288-89, 16295, 21504-05, 23440, 23947, 24424, 24495-98, 24499-509, 24512-15, 24517-22, 24524-34, 24536-37, 24568-69

Current status: In 1987, British Coal classified the main block of land shown on the map under `General Area of Future Interest Within 5 Years': it does not feature in British Coal's most recent proposals. The smaller area is part of Ffos-Las authorised open cast coal site.

Description: An irregularly shaped area about 2km by 2km. The

land slopes gently down from a high-point in the SE of about 240m to the valley floor of the Gwendraeth Fawr at about 10m OD. Generally, a landscape of scattered farms set in irregularly-shaped fields. Much of the land is improved pasture, though a wide band alongside the working open cast comprises rushy covered fields and stands of scrubby woodland. All the farms are currently working.

Archaeology: Site 11152 a standing stone, and only definite prehistoric site in the area, has now been destroyed. The remainder of sites recorded in the survey mostly comprise standing building, ridge and furrow and industrial sites associated with coal mining. Of the latter, 16288 and 23440, represent medium-sized coal mines.

8.2.4 Capel Ifan (Map 21)

Sites in catalogue: 1690, 24936.

Current status: Classified by British Coal as `General areas of interest within 5 years'.

Description: An area of scattered farms set amongst small fields and small stands of woodland on the S. side of the Gwendraeth Fawer river.

Archaeology: No desk top assessment has been carried out for this area and no field visit made. Consequently only two sites are recorded on the SMR. None are of any great antiquity.

8.2.5 Maes Mawr and Pont Andrew (Map 22)

Sites in Catalogue: Maes Mawr - 10819, 13363-65, 16821, 22023, 22036, 22037, 24176, 24239, 24547-50, 24552-54, 24556, 24558-59, 27722-27. Pont Andrew - 16829, 24193, 24198, 24602-03.

Current status: Both areas are classified `General areas of future interest within 5 years' by British Coal. British Coal own portions of each area, but generally the land is privately owned and still farmed.

Description: These two areas lie on the valley sides of the Gwendraeth Fawr. Land in Maes Mawr achieves a maximum height of about 100m, in Pont Andrew it reaches 150m. Both areas run down to the valley bottom at *c.* 45m. In both areas the landscape is one of dispersed farms set amongst small fields of improved pasture. On higher ground to the S. the land is of poorer quality. There are some small stands of trees. Coal mines have been active in both areas.

Archaeology: Only Maes Mawr has been examined on the ground. The archaeological potential of Pont Andrew is unknown. In Maes Mawr several sites may be of prehistoric origin (10819, 13363, 13365), but the major archaeological remains are a coal mine (16821) and associated features.

8.2.6 Rock Castle West and Blaen-y-Glyn (Map 23)

Sites in catalogue: 642, 808, 7673-5, 24051, 27740-43, 27747

Current status: The application from British Coal for open cast coaling operations in this area is currently the subject of a public enquiry. Much of the present area of interest has been previously subject to open cast coaling operations; this land has been reinstated.

Description: Where subject to open cast coaling and subsequently reinstated, the landscape is one of large, square fields set in rounded terrain. In the centre of the study area scattered farms and small irregular fields predominate. On the northern fringes larger field enclosures are probably the result of encroachments on to Mynydd Pentregwenlais common. The regular field pattern at the extreme W. end of the study area results from early 19th century enclosure acts for Mynydd Mawr.

Archaeology: No field investigation has been undertaken in this area as part of this study. However, a preliminary archaeological assessment (James 1992) and a archaeological field evaluation (Phillips and Benson 1993) has been recently carried out.

Several sites of interest lie within the study area. 808 is a prehistoric burnt mound. This identification was confirmed by test excavations in 1993. Trial excavations on site 7673 failed to reveal foundations or other evidence which would have confirmed that this was the site of a dark age chapel. Full details of the these excavations and others are contained in the 1993 report. Sites not investigated in the field evaluation include 642, Castell-y-Rhingell, possibly a medieval moated site and several 19th century coal mines and associated features - 27740-43.

8.2.7 Cathilas (Map 24)

Sites in catalogue: 873, 10987, 13126, 20912, 24414.

Current status: Classified by British Coal as `General areas of interest within 5 years'.

Description: This area ranges in height from 90m up to 250m. It is characterised by regular-shaped fields of poor quality land which run out into open moorland to the E. There is some tree cover on the steeper valley sides. The settlement pattern is one of scattered farms.

Archaeology: No desk top assessment has been undertaken for this area and no field visit made. Only five sites are recorded including a large block of 19th century Parliamentary enclosure (24414) on the E. and SE. side of the area. Other sites of interest include a medieval settlement (10987) centred on Cathilas farm and a prehistoric burnt mount (873).

8.2.8 Amman Colliery (Map 25)

Sites in catalogue: 7679, 18221, 24639.

Current status: Classified by British Coal as `Undergoing investigation'. Ownership uncertain - land not now farmed.

Description: This area, situated on the N side of the Amman valley, rises steeply from 120m in the valley bottom to over 200m. The land is enclosed but is now rough pasture and rush-covered. There is some scrubby woodland towards the valley bottom.

Archaeology: The only archaeological sites recognised in this area were those associated with coal mining and a deserted farmstead. The condition of the land at the time of the survey mitigated against the recognition of low earthworks and sites of a similar nature.

8.2.9 East Pit Extension (Map 26)

Sites in catalogue: None.

Current status: Classified by British Coal as `Undergoing investigation'.

Description: A small area on the valley floor at the watershed of the Amman and Llynfell.

Archaeology: Maps and other documents were not searched for this area. No field visit was made. There are no known archaeological sites in the area.

8.2.10 Henllys (Map 27)

Sites in Catalogue: 5504-05, 10069, 19973-74, 19976-77, 20466, 20810, 20949, 21142, 21175, 21372, 21412, 21414, 21960, 22076, 22120, 25545.

Current status: Undergoing geological investigation.

Description: Urbanised in the S. part of the area of interest. the N. part gives way to large fields of poor quality pasture and eventually open moorland.

Archaeology: This area had not been examined on the ground. On the SMR the major area of interest is centred on the old coal mine (5504). This has undergone some clearance, but the fine bank of lime kilns (5505) survives. These kilns were supplied via a tramway (25545) from quarries on the Black Mountain (see section 8.1.1)

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Bishop Collection
Stepney Collection
CAC Collection

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Llanarthney Parish
Llandybie Parish
Llanelli Parish
Llanddarog Parish
Llanddeusant Parish
Llandeilofawr Parish
Llanfihangel Aberbythych Parish
Llangadog Parish
Llangyndeyrn Parish
Llannon Parish
Pembrey Parish
Quarter Bach Parish

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10 MAPS

Where no provided with a scale, the detailed study area maps are reproduced at 1:10,000 or 10:560.

Map 1. Geology and topography

Map 2. Threats

Map 3. Location of detailed study areas

Key to symbols used on maps of detailed study areas

Map 4. The Black Mountain

Map 5. Llygad Llwchwr

Map 6. Cincoed and Careg Dwfn

Map 7. Pistyll and Y Garn

Map 8. Cilyrychen

Map 9. Carmel Woods

Map 10. Allt-y-Garn and Llwyn-y-Fran

Map 11. Dyllgoed

Map 12. Foel-Gastell and Danylan

Map 13. Mynydd Cerrig and Maesdulais

Map 14. Mynydd Llangyndeyrn

Map 15. Limestone Hill

Map 16. Blaenyfan and Four Roads

Map 17. Mynydd-y-Garreg

Map 18. Glanstony

Map 19. Glasbury and Syddyn Melyn

Map 20. Dan-y-Banc

Map 21. Capel Ifan

Map 22. Maes Mawr and Pont Andrew

Map 23. Rock Castle West and Blaen-y-Glyn

Map 24. Cathilas

Map 25. Amman Colliery

Map 26. East Pit Extension

Map 27. Henllys

KEY TO SYMBOLS USED ON MAPS OF DETAILED STUDY AREAS

lime kiln

extent of large quarry or large coal mine

coal working site/shaft

tramway

linear site

other industrial site

medieval/post medieval settlement

prehistoric site

ridge and furrow

other site

SOUTH-EAST DYFED MINERALS: A SURVEY OF THE ARCHAEOLOGICAL RESOURCE THREATENED BY MINERAL EXTRACTION

March 1994

In two parts
Part 2

Consultant: Dyfed Archaeological Trust Ltd.
The Old Palace, Abergwili,
CARMARTHEN, Dyfed, SA33 2JG

Report by: K. Murphy, BA. MIFA
P.Sambrook, BA

Client: Cadw, Brunel House,
2 Fitzalan Road,
CARDIFF, CF2 1UY

11 CATALOGUE OF SITES

This catalogue is computer-generated from Dyfed Archaeological Trust's Sites and Monuments Record. Due to lack of space not every record field has been reproduced here. For a complete record reference should by made to the SMR data-base.

MAP 1. GEOLOGY

Carboniferous limestone

Carboniferous millstone grit

Carboniferous coal measures

Llanpumsaint
Llanllawddog
CARMARTHEN CC
Llanfynydd
DINEFWR
Manordeilo and Salem
Myddfai
Bronwydd
Llanegwad
Abergwili
Llangathen
LLANDEILO
Llandeilo
Llangadog
Llanddeusant
CARMARTHEN
Cyngor Bro Dyffryn Cennen
Llanarthney
Llangunnor
Llanfihangel Aberbythych
Llanddarog
Gorslas
Quarter Bach
Llandyfaelog
Llandybie
Cwmamman
Llangyndeyrn
Pontyberem
Amman
Betws
Llannon
Pontyates
Llanedi
LLANELLI CC
Trimsaran
LLANELLI (B)
LLANELLI DISTRICT
Llanelli Rural
GLAMORGAN
LLIW VALLEY DISTRICT
Pontardulais
N
0
10 km

MAP 2. THREATS

- Quarry - active
- Quarry - inactive with planning permission
- Open cast - active
- Open cast - restored
- Open cast - area of future interest

CARMARTHEN CC

DINEFW

LLANELLI CC

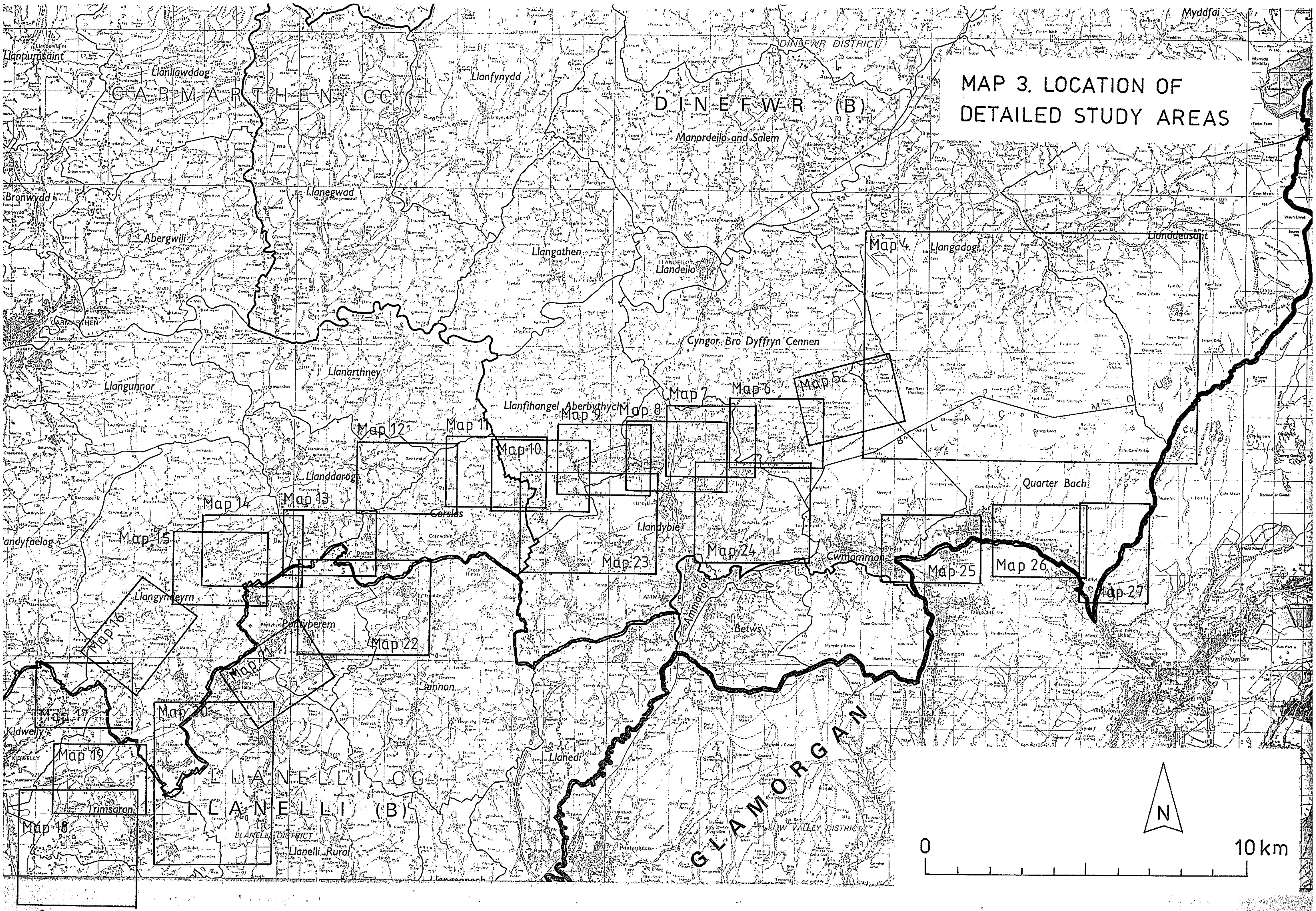
LLANELLI (B)

GLAMORGAN

Llanpumsaint
Llanllawddog
Llanfynydd
Manordeilo and Salem
Bronwydd
Llanegwad
Abergwili
Llangathen
LLANDEILO
Llandeilo
Llangadog
Llanddeusant
CARMARTHEN
Cyngor Bro Dyffryn Cennen
Llanarthney
Llangunnor
Llanfihangel Aberbythych
Llanddarog
Gorslas
Llandyfaelog
Tradybie
Cwmamman
Quarter Bach
Pontyberem
Betws
Llannon
Kidwelly
Llanedi
Trimsaran
Llanelli Rural
LLANELLI DISTRICT
LLIW VALLEY DISTRICT

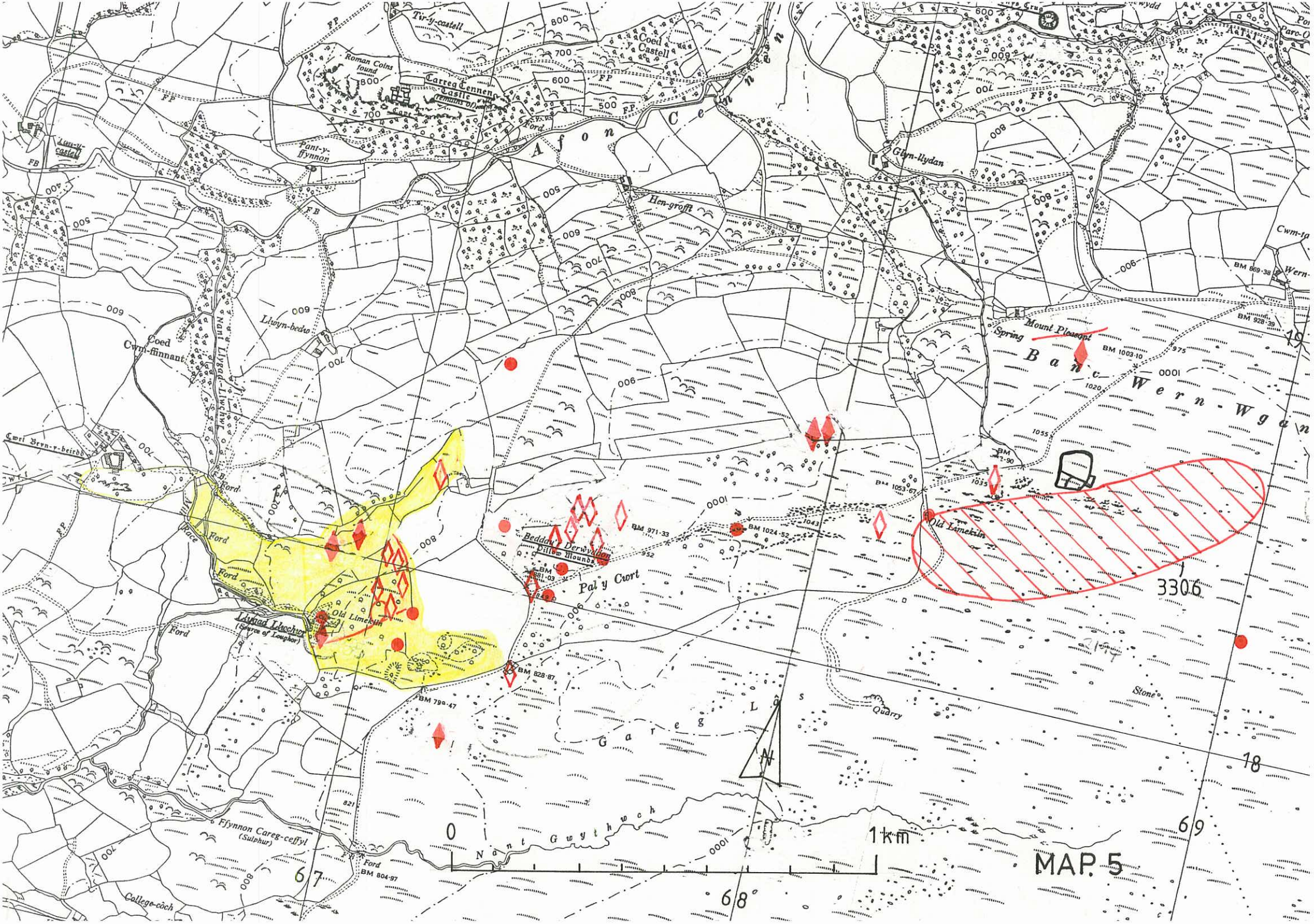
N

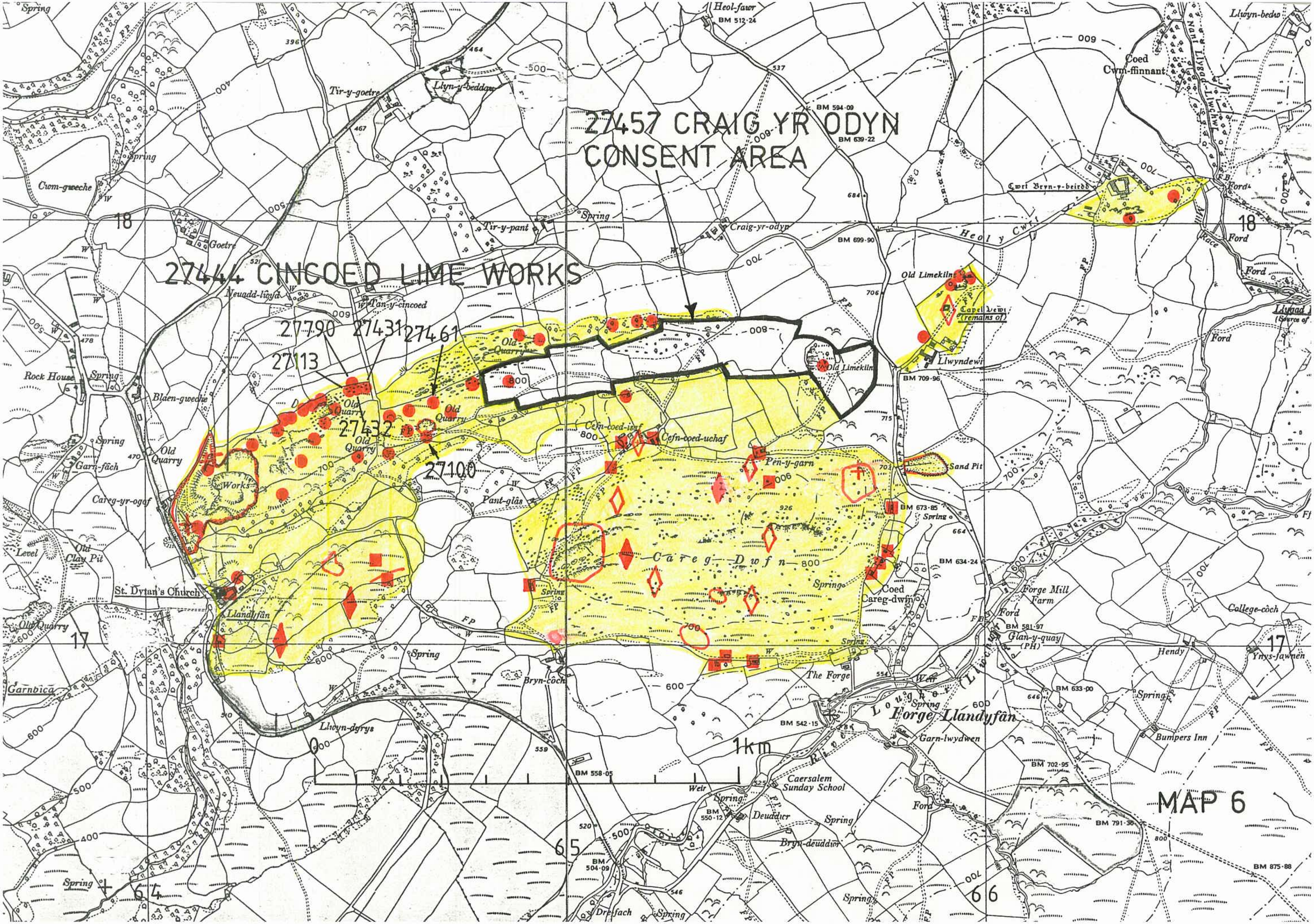
0 10km



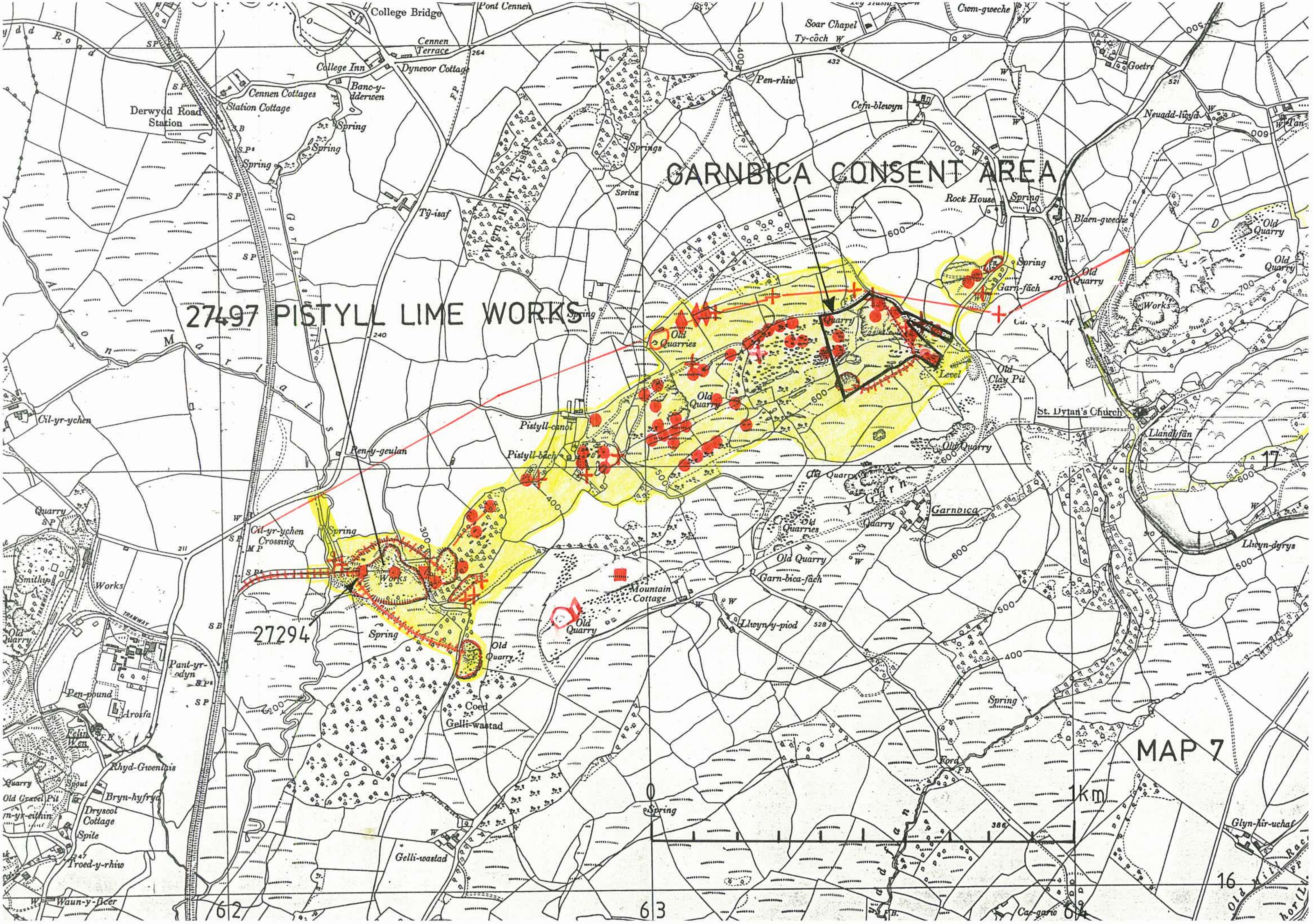
MAP 3. LOCATION OF DETAILED STUDY AREAS

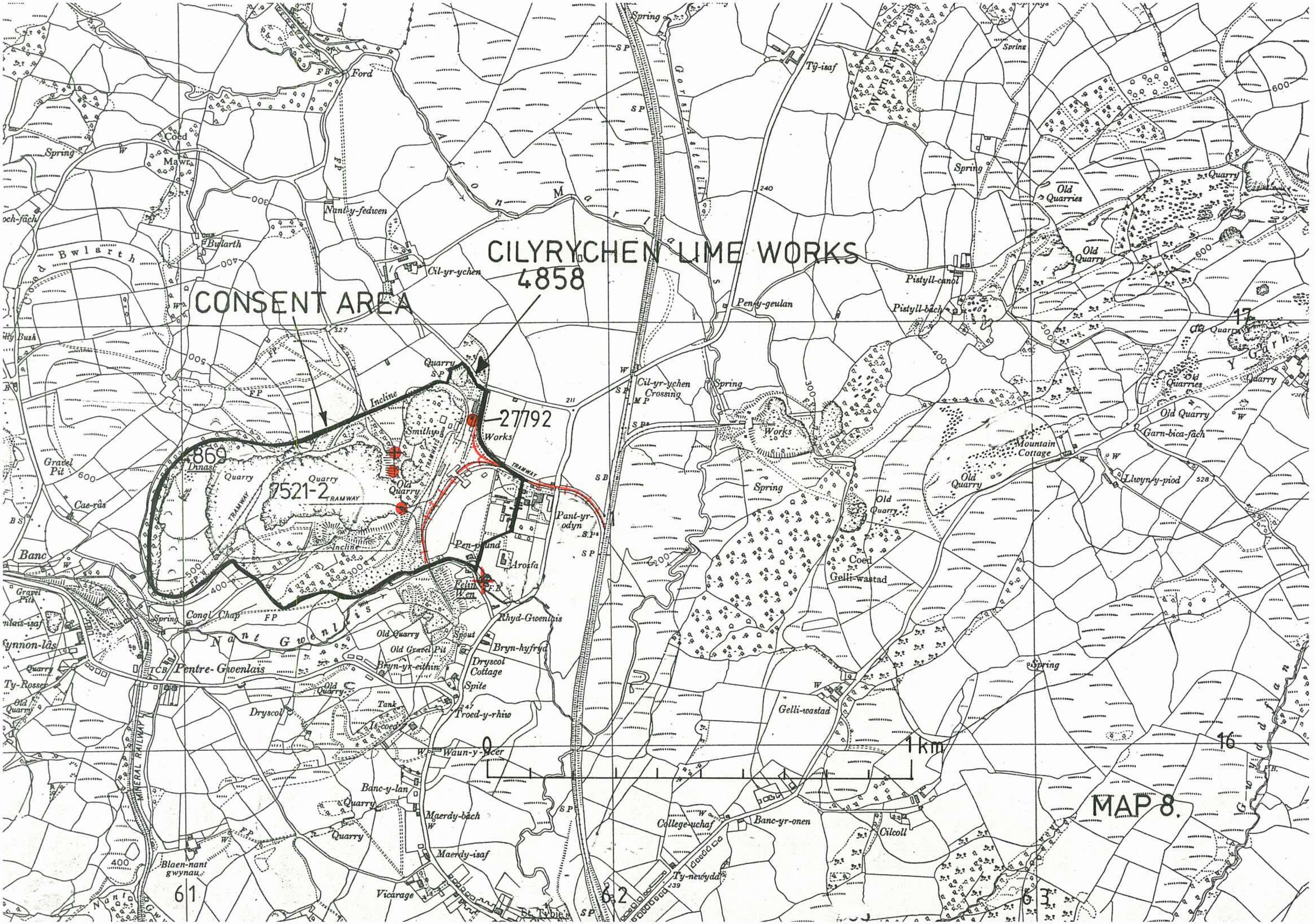
MAP 4
THE BLACK MOUNTAIN (Y MYNYDD DU)
LLANGADOG C
LLANDDEUSANT C
24461
24458
4592
27608
27607
27606
27605
19213
0
1km
N
Brest Cwm Llwyd
Foel Fawr
Foel Nant Dwfn
Carreg Cennen
Moel Gornach
Foel Fraith
Garreg Lwyd
Cefn y Truman
Cefn y Cylchau
Blaenpedol
Garreg Fraith
Pen Rhiw-wen
Cwar Penrhiw-wen (Disused Quarry)
Garreg Las
Cefn Carn Fadog
Capel-Gwynfe
Old Limeworkings
Area of Shake Holes
Quarry (dis)


Afon Cennen
Tyr-y-castell
Roman Coins found
Carreg Cennen Castle (remains of)
Coed Castell
Pant-y-ffynnon
Glyn-llydan
Hen-grofft
Llwyn-bedw
Coed Cwm-finnant
Nant Llygad-Llwchwr
Cwrt Bryn-y-beirdd
Ford
Race
Llygad Llwchwr (Source of Loughor)
Old Limekiln
Beddau'r Derwyddon (Pillow Mounds)
Pal y Cwrt
Mount Pleasant
Spring
Banc Wern-Wgan
Old Limekiln
330.6
Quarry
Stone
Garreg Lwyd
Nant Gwythwch
Ffynnon Careg-ceffyl (Sulphur)
College-coch
BM 971·33
BM 1024·52
BM 881·03
BM 828·87
BM 799·47
BM 804·97
BM 1003·10
BM 928·39
BM 869·38
BM 1053·67
0
1km
N
MAP 5
67
68
69
18

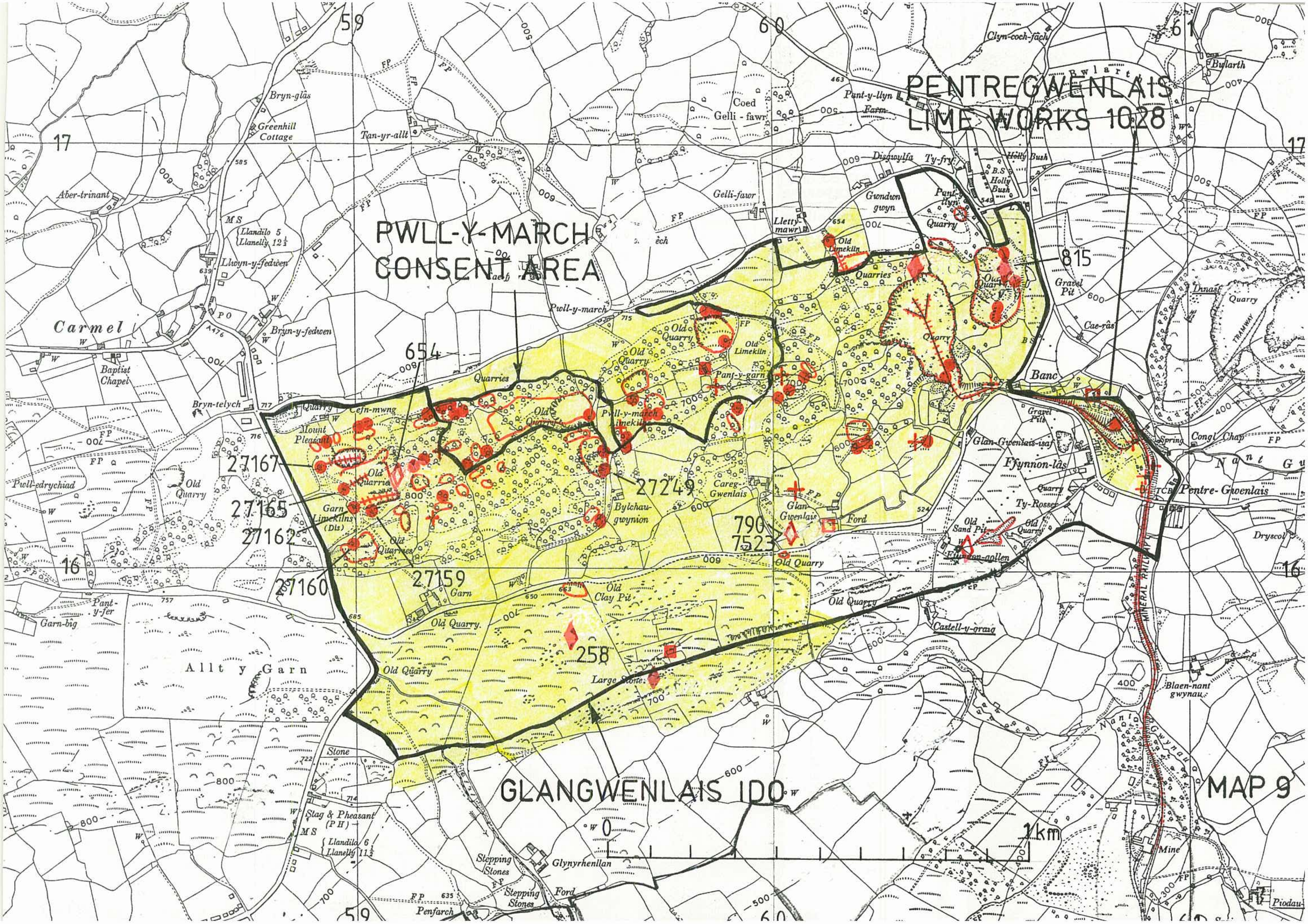


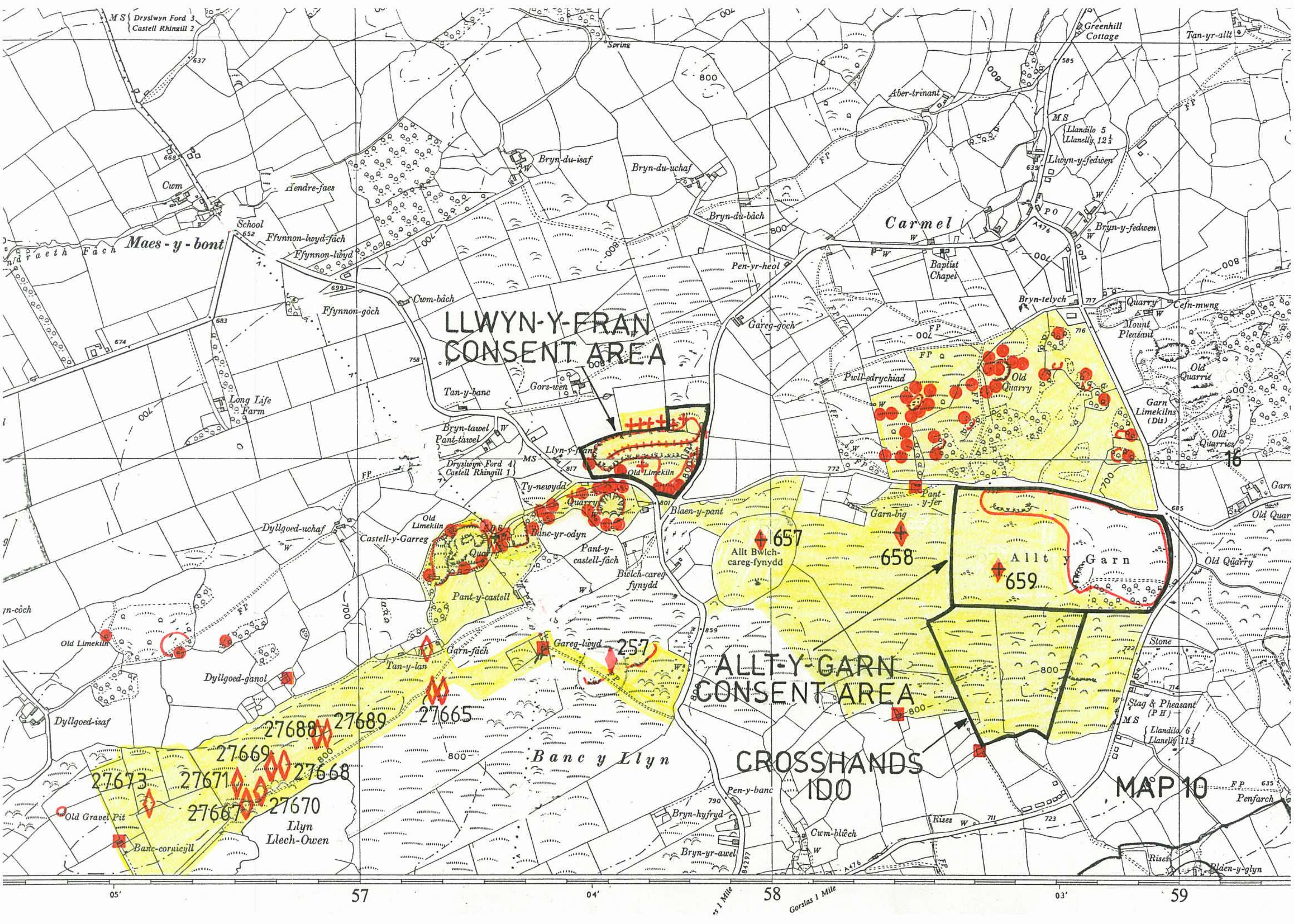
27457 CRAIG YR ODYN
CONSENT AREA
27444 CINCOED LIME WORKS
27790
27431
27461
27113
27432
27100
MAP 6
0
1km
Tir-y-goetre
Llyn-y-beddau
Cwm-gweche
Goetre
Tir-y-pant
Craig-yr-odyn
Cwrt Bryn-y-beirdd
Heol y Cwrt
Coed Cwm-ffinnant
Heol-fawr
Neuadd-lwyd
Tan-y-cincoed
Rock House
Blaen-gweche
Garn-fâch
Careg-yr-ogof
Old Clay Pit
St. Dyfan's Church
Llandyfân
Garnbica
Old Limekiln
Capel Dewi (remains of)
Llwyndewi
Cefn-coed-isaf
Cefn-coed-uchaf
Pen-y-garn
Sand Pit
Pant-glâs
Careg Dwfn
Coed Careg-dwfn
Forge Mill Farm
Glan-y-quay (PH)
Hendy
Ynys-fawnen
College-côch
The Forge
Forge Llandyfân
River Loughor (Llwchwr)
Garn-lwydwen
Bumpers Inn
Bryn-côch
Llwyn-dyrys
Caersalem Sunday School
Deuddwr
Bryn-deuddwr
Dre-fach
Llwyn-bedw


GARNBICA CONSENT AREA
27497 PISTYLL LIME WORKS
27294
MAP 7
0
1km
College Bridge
Pont Cennen
Cwm-gweche
Soar Chapel
Ty-côch
Cennen Terrace
College Inn
Dynevor Cottage
Banc-y-dderwen
Cennen Cottages
Station Cottage
Derwydd Road Station
Spring
Pen-rhiw
Cefn-blewyn
Goetre
Neuadd-lwyd
Springs
Rock House
Blaen-gweche
Tŷ-isaf
Old Quarry
Old Quarries
Garn-fâch
Works
Level
Old Clay Pit
St. Dylan's Church
Llandyfân
Pistyll-canol
Pistyll-bach
Pen-y-geulan
Cil-yr-ychen
Cil-yr-ychen Crossing
Quarry
Smithy
Tramway
Y Garn
Garnbica
Garn-bica-fâch
Mountain Cottage
Llwyn-y-piod
Llwyn-dyrys
Pant-yr-odyn
Pen-pound
Arosfa
Felin Wen
Rhyd-Gwenlais
Bryn-hyfryd
Old Gravel Pit
Dryscol Cottage
Spite
Troed-y-rhiw
Waun-y-ffcer
Coed Gelli-wastad
Gelli-wastad
Ford
Glyn-hir-uchaf
Car-gario
62
63
64
16
17

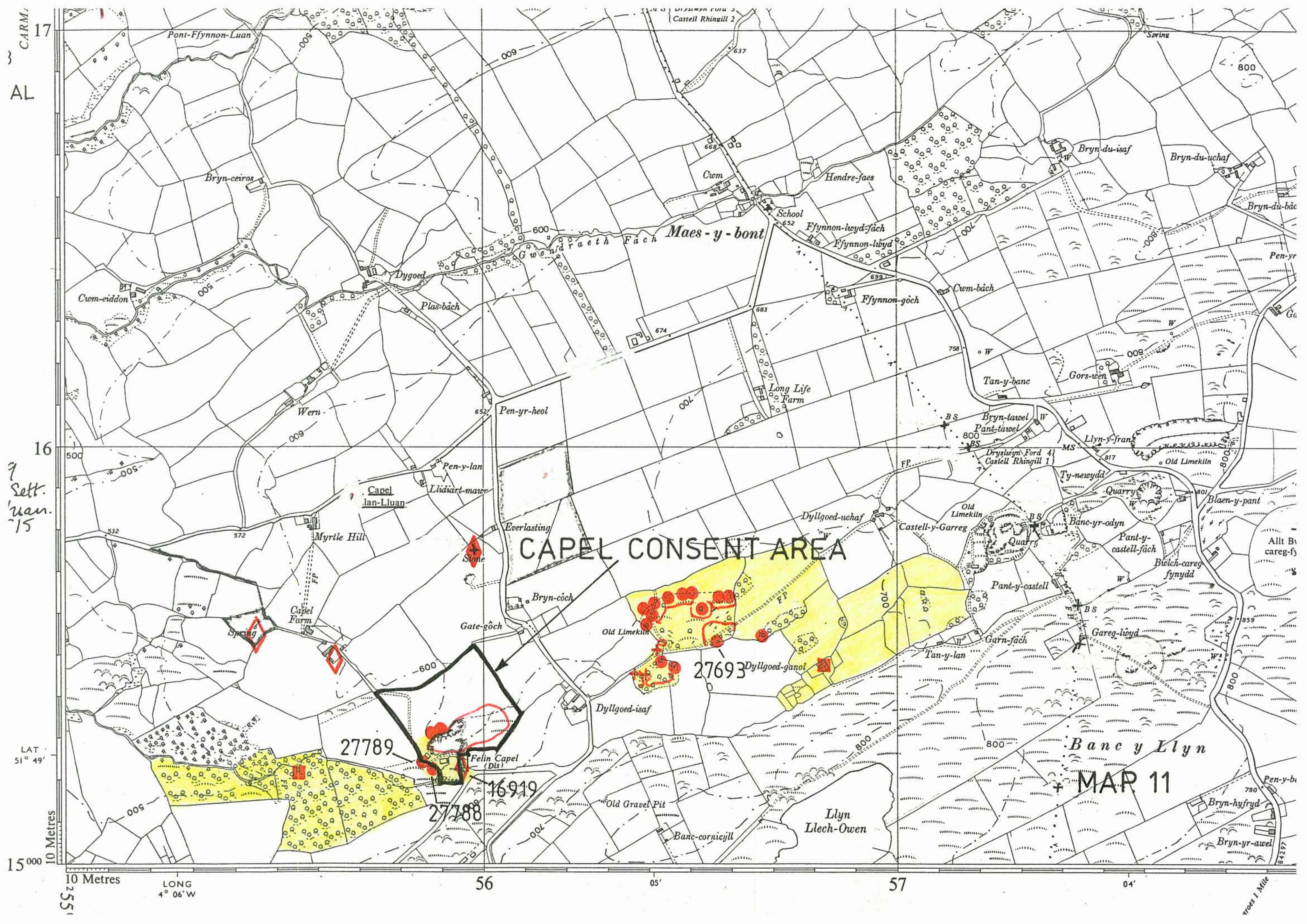


CILYRYCHEN LIME WORKS
4858
CONSENT AREA
27792
4869
7521-2
MAP 8.
0
1km
Ford
Coed Mawr
Spring
Nant-y-fedwen
Bwlarth
Coed Bwlarth
Cil-yr-ychen
Afon Marlais
Gorsllwyn
Tŷ-isaf
Spring
Old Quarries
Quarry
Old Quarry
Pistyll-canol
Pistyll-bach
Pen-y-geulan
Cil-yr-ychen Crossing
Works
Incline
Smithy
Quarry
Dinas
Old Quarry
TRAMWAY
Works
Pant-yr-odyn
Pen-pound
Arosfa
Felin Wen
Gravel Pit
Cae-râs
Banc
Gravel Pits
Spring
Congl Chap
Nant Gwenlais
Rhyd-Gwenlais
Old Quarry
Old Gravel Pit
Spout
Bryn-hyfryd
Bryn-yr-eithin
Dryscol Cottage
Pentre-Gwenlais
Ffynnon-lâs
Quarry
Ty-Rosser
Old Quarry
Dryscol
Tank
Is-coed
Spite
Troed-y-rhiw
Waun-y-gler
MINERAL RAILWAY
Banc-y-lan
Quarry
Maerdy-bach
Maerdy-isaf
Blaen-nant gwynau
Vicarage
St. Tybie's
Mountain Cottage
Garn-bica-fach
Llwyn-y-piod
Old Quarry
Spring
Coed Gelli-wastad
Gelli-wastad
College-uchaf
Banc-yr-onen
Cilcoll
Ty-newydd
Y Garn
17
16
61
62
63

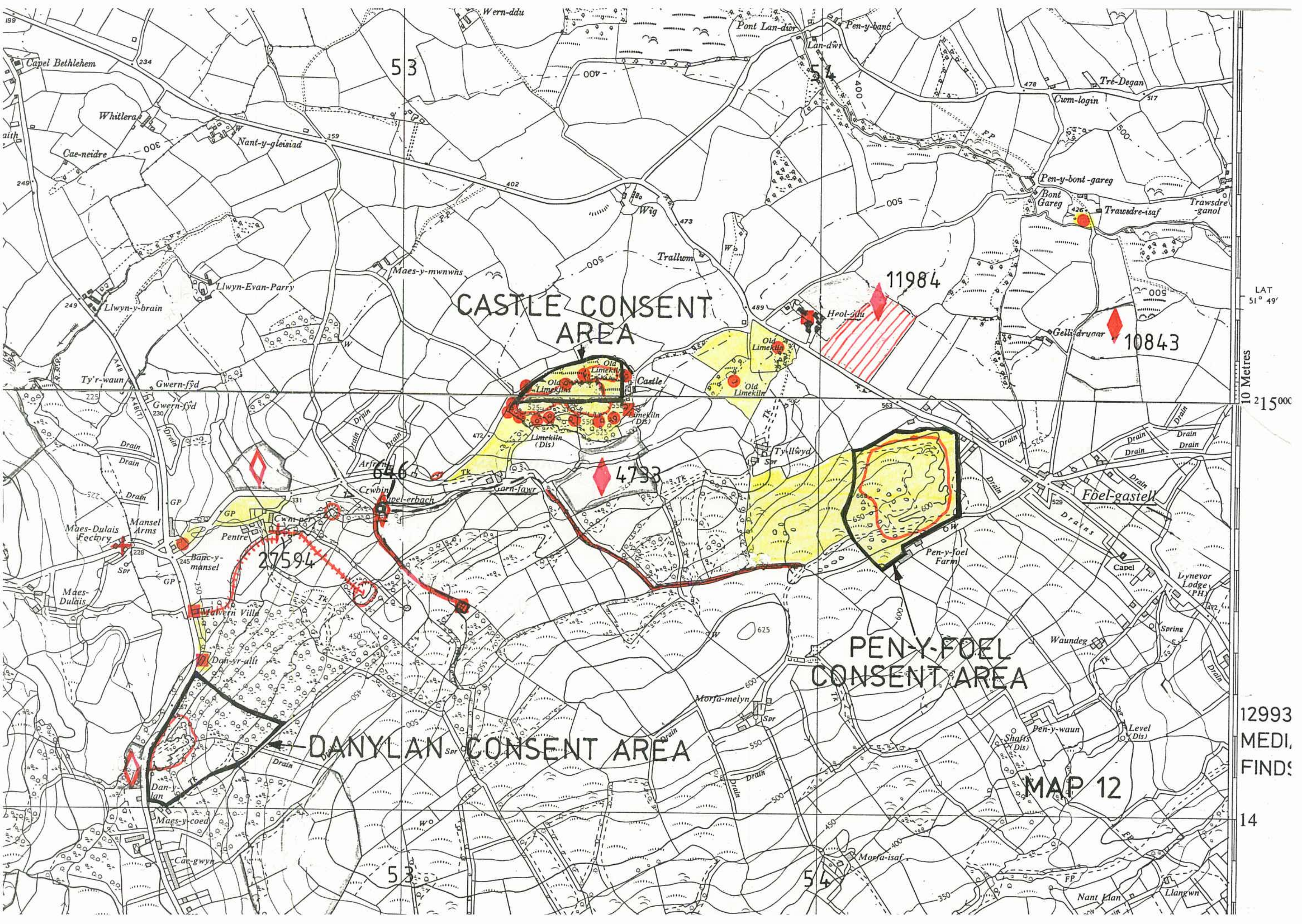

PENTREGWENLAIS LIME WORKS 1028
PWLL-Y-MARCH CONSENT AREA
GLANGWENLAIS IDO
MAP 9
815
654
27167
27165
27162
27160
27159
27249
790
7523
258
0
1km
Carmel
Baptist Chapel
Bryn-telych
Bryn-glâs
Greenhill Cottage
Tan-yr-allt
Aber-trinant
Llwyn-y-fedwen
Bryn-y-fedwen
Coed Gelli-fawr
Gelli-fawr
Pant-y-llyn Farm
Disgwylfa
Ty-fry
Holly Bush
Clyn-coch-fach
Bwlarth
Pwll-y-march
Cefn-mwng
Mount Pleasant
Garn Limekilns (Dis)
Old Quarries
Old Quarry
Old Limekiln
Quarries
Quarry
Gravel Pit
Cae-râs
Banc
Pant-y-garn
Pwll-y-march Limekiln
Bylchau-gwynion
Careg-Gwenlais
Glan Gwenlais
Ford
Glan-Gwenlais-isaf
Ffynnon-lâs
Ty-Rosser
Old Sand Pit
Pentre-Gwenlais
Congl Chap
Dryscol
Castell-y-graig
Old Clay Pit
Garn
Large Stone
Allt y Garn
Pwll-edrychiad
Pant-y-fer
Garn-big
Stone
Stag & Pheasant (P H)
Llandilo 6
Llanelly 11½
Llandilo 5
Llanelly 12½
Stepping Stones
Glynyrhenllan
Penfarch
Blaen-nant gwynau
Mine
Piodau
Dinas
MINERAL RAILWAY
Nant Gwynau
59
60
61
17
16

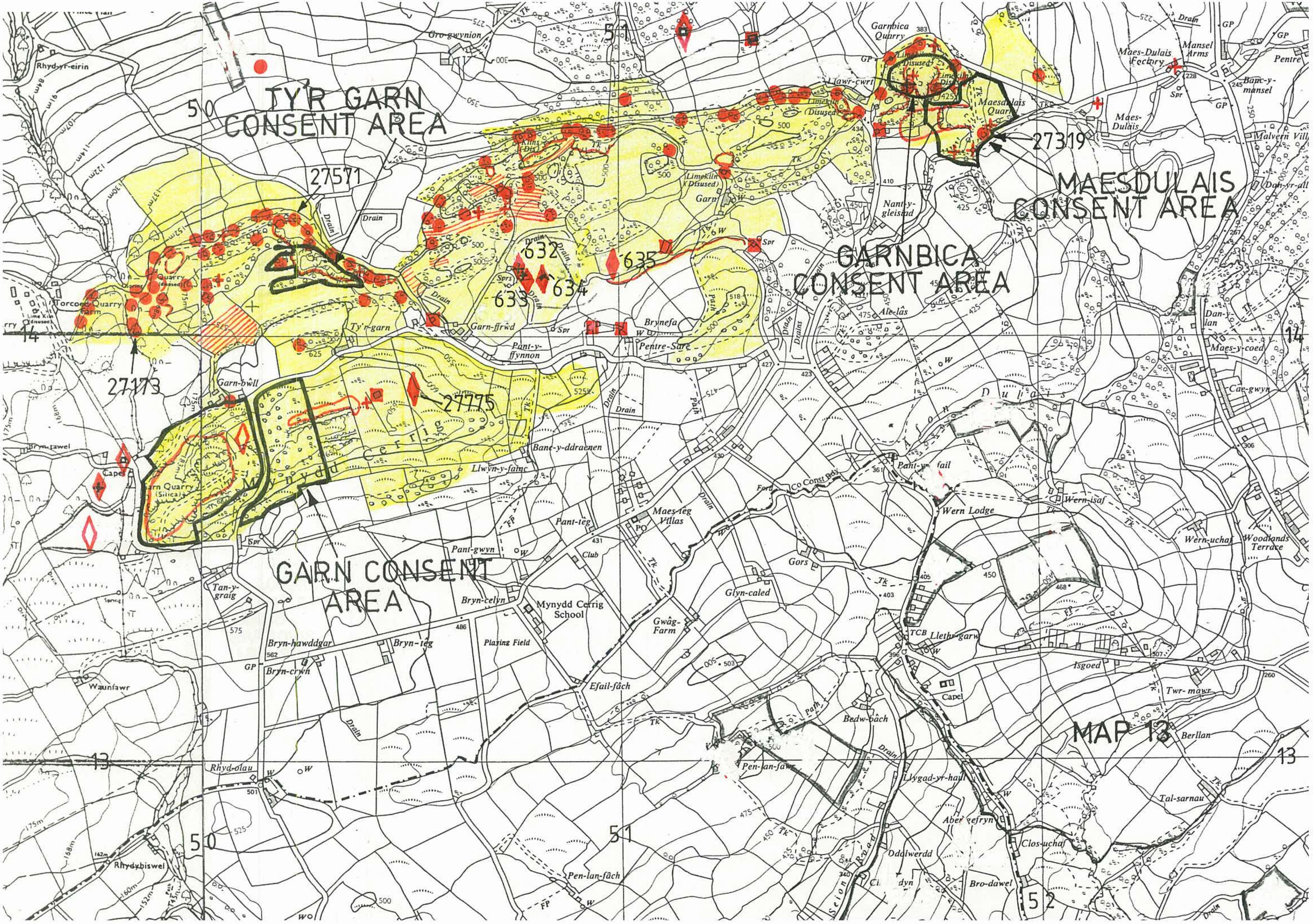


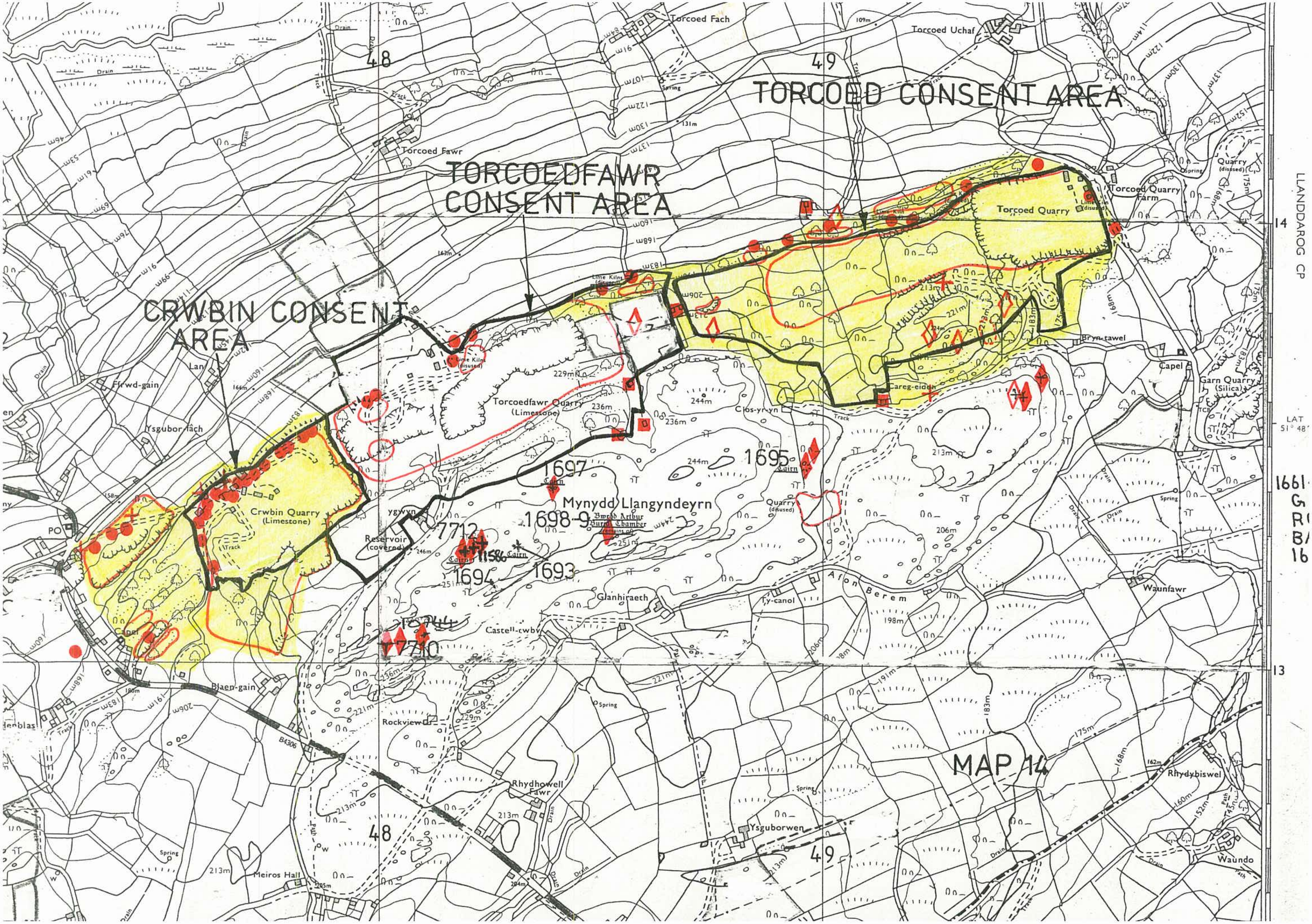
LLWYN-Y-FRAN
CONSENT AREA
ALLT-Y-GARN
CONSENT AREA
CROSSHANDS
IDO
MAP 10
657
658
659
257
27665
27688
27689
27669
27668
27673
27671
27667
27670
Allt y Garn
Allt Bwlch-careg-fynydd
Banc y Llyn
Llyn Llech-Owen
Maes-y-bont
Carmel
Baptist Chapel
Bryn-telych
Quarry
Cefn-mwng
Mount Pleasant
Old Quarrie
Garn Limekilns (Dis)
Old Quarries
Old Quarry
Pwll-edrychiad
Pant-y-fer
Garn-big
Blaen-y-pant
Bwlch-careg-fynydd
Pant-y-castell-fach
Banc-yr-odyn
Ty-newydd
Castell-y-Garreg
Old Limekiln
Pant-y-castell
Garn-fach
Tan-y-lan
Gareg-lwyd
Dyllgoed-uchaf
Dyllgoed-ganol
Dyllgoed-isaf
Old Limekiln
Old Gravel Pit
Banc-cornicyll
Llyn-y-fran
Drysllwyn Ford 4
Castell Rhingill 1
Bryn-tawel
Pant-tawel
Tan-y-banc
Gors-wen
Long Life Farm
Ffynnon-goch
Cwm-bach
Ffynnon-lwyd
Ffynnon-lwyd-fach
School
Hendre-faes
Cwm
Bryn-du-isaf
Bryn-du-uchaf
Bryn-du-bach
Pen-yr-heol
Gareg-goch
Aber-trinant
Llwyn-y-fedwen
Bryn-y-fedwen
Greenhill Cottage
Tan-yr-allt
Llandilo 5
Llanelly 12½
Drysllwyn Ford 3
Castell Rhingill 2
Spring
Stag & Pheasant (PH)
Llandilo 6
Llanelly 11½
Stone
Penfarch
Rises
Blaen-y-glyn
Cwm-blwch
Bryn-hyfryd
Bryn-yr-awel
Pen-y-banc
Old Quarry
Gorslas 1 Mile
57
58
59
16

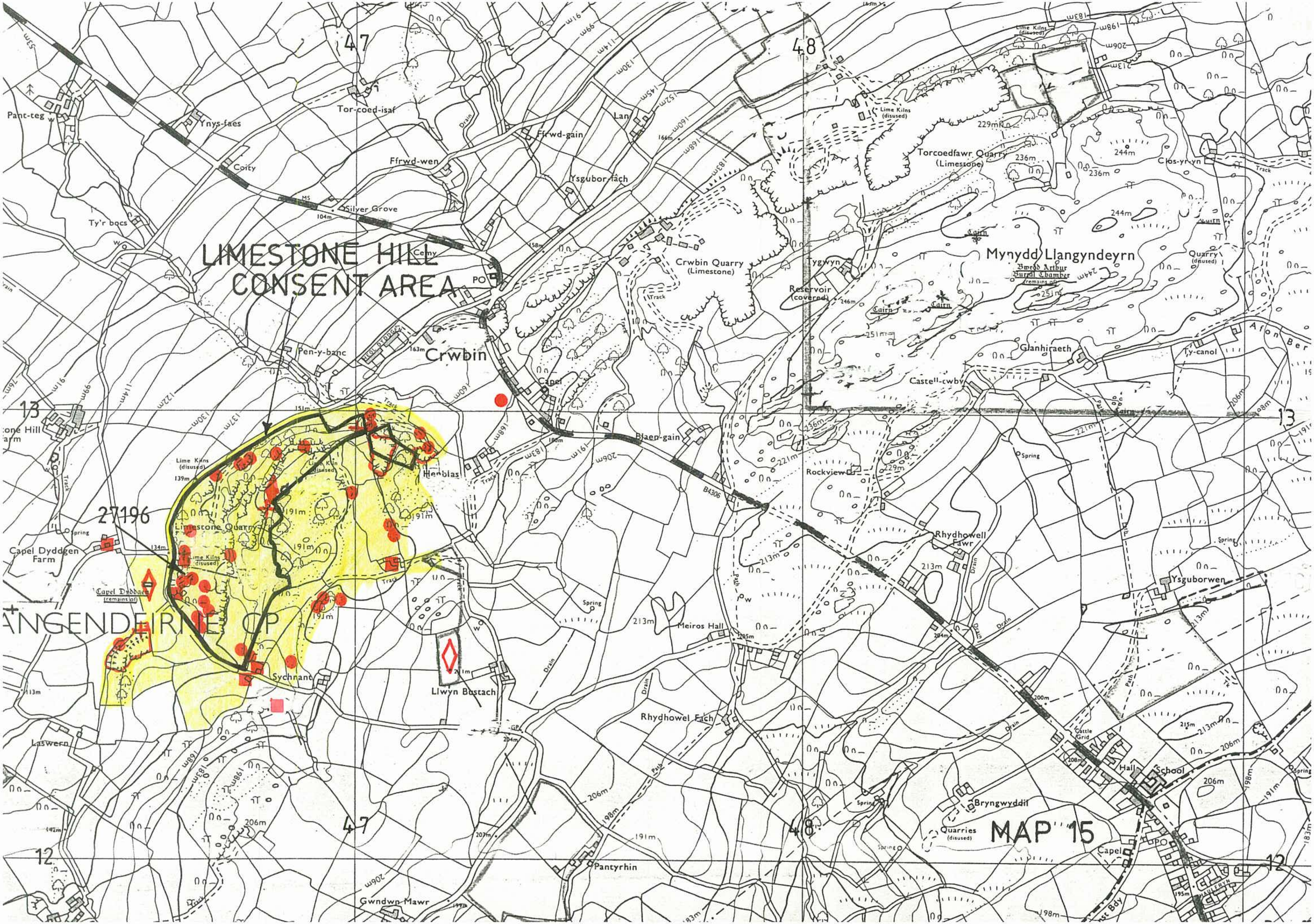


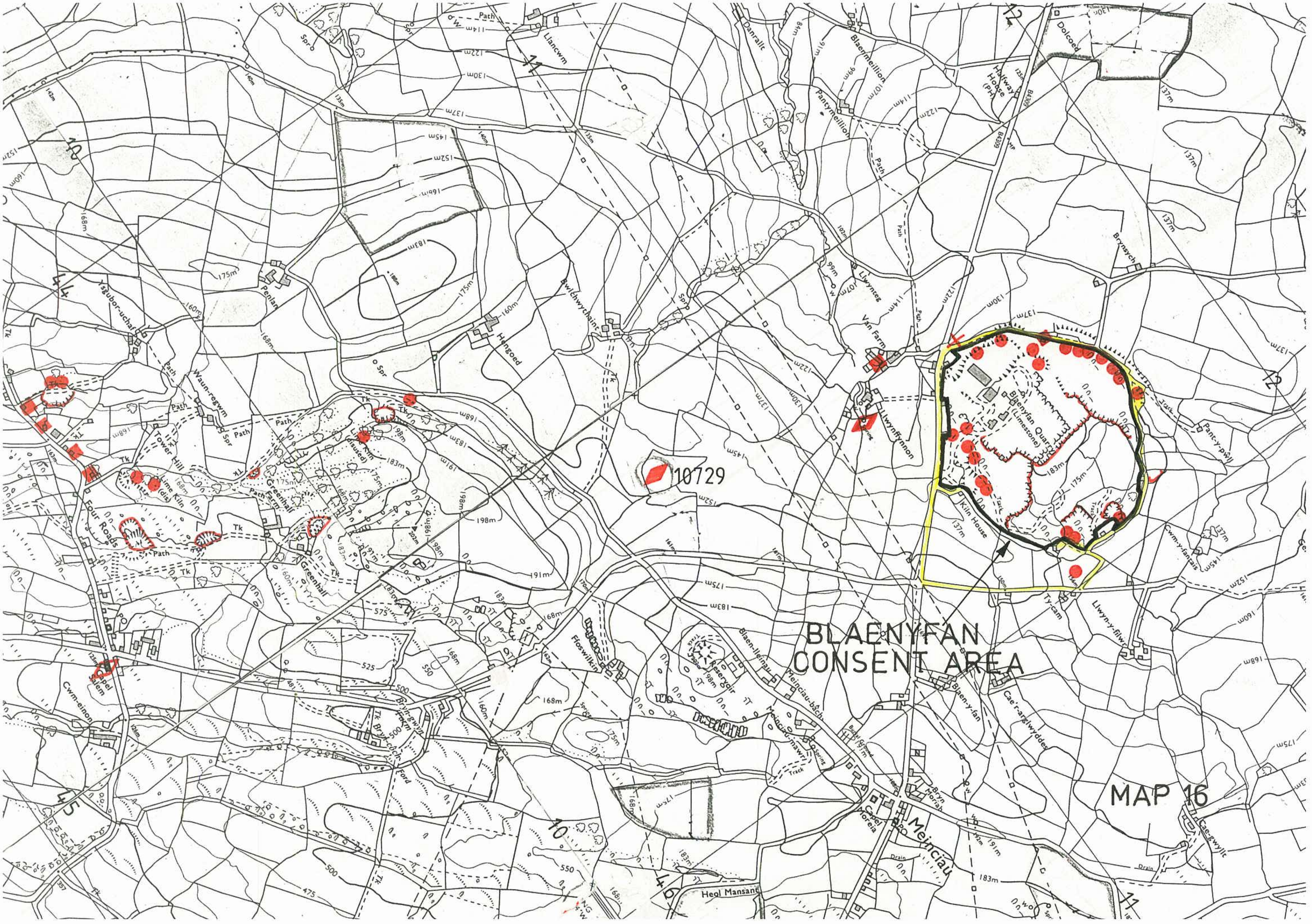
CAPEL CONSENT AREA
MAR 11
27789
27788
16919
27693
Capel
Llan-Lluan
Sett.
Maes-y-bont
Gwendraeth Fach
Pont-Ffynnon-Luan
Bryn-ceiros
Cwm-eiddon
Dygoed
Plas-bâch
Wern
Pen-yr-heol
Pen-y-lan
Llidiart-mawr
Myrtle Hill
Everlasting
Stone
Bryn-côch
Capel Farm
Spring
Gate-gôch
Felin Capel (Dis)
Dyllgoed-isaf
Dyllgoed-uchaf
Dyllgoed-ganol
Old Limekiln
Castell-y-Garreg
Cwm
School
Hendre-faes
Ffynnon-lwyd-fâch
Ffynnon-lwyd
Ffynnon-gôch
Cwm-bâch
Long Life Farm
Tan-y-banc
Gors-wen
Bryn-tawel
Pant-tawel
Llyn-y-fran
Drysllwyn Ford 4
Castell Rhingill 1
Ty-newydd
Quarry
Blaen-y-pant
Banc-yr-odyn
Pant-y-castell-fâch
Bwlch-careg fynydd
Pant-y-castell
Tan-y-lan
Garn-fâch
Gareg-lwyd
Bryn-du-isaf
Bryn-du-uchaf
Bryn-du-bâch
Banc y Llyn
Old Gravel Pit
Banc-cornicyll
Llyn Llech-Owen
Bryn-hyfryd
Bryn-yr-awel
Spring
10 Metres
LONG 4° 06′ W
LAT 51° 49′
56
57
16
17
15 000


CASTLE CONSENT AREA
PEN-Y-FOEL CONSENT AREA
DANYLAN CONSENT AREA
MAP 12
11984
10843
4733
646
27594
12993
MEDIA
FINDS
Capel Bethlehem
Whitlera
Nant-y-gleisiad
Cae-neidre
Wern-ddu
Pont Lan-dŵr
Pen-y-banc
Lan-dŵr
Tre-Degan
Cwm-login
Pen-y-bont-gareg
Bont Gareg
Trawsdre-isaf
Trawsdre-ganol
Wig
Trallwm
Maes-y-mwnwns
Llwyn-Evan-Parry
Llwyn-y-brain
Heol-ddu
Gelli-dywyll
Old Limekiln
Old Limekilns
Castle
Limekiln (Dis)
Ty'r-waun
Gwern-fŷd
Ty-llwyd
Foel-gastell
Arfryn
Crwbin
Capel-erbach
Garn-fawr
Cwm-per
Pentre
Mansel Arms
Maes-Dulais Factory
Banc-y-mansel
Maes-Dulais
Malvern Villa
Dan-yr-allt
Dan-y-lan
Maes-y-coed
Cae-gwyn
Pen-y-foel Farm
Capel
Dynevor Lodge (PH)
Waundeg
Morfa-melyn
Pen-y-waun
Shafts (Dis)
Level (Dis)
Morfa-isaf
Nant Llan
Llangwn
LAT 51° 49'
10 Metres
215000
53
54
14

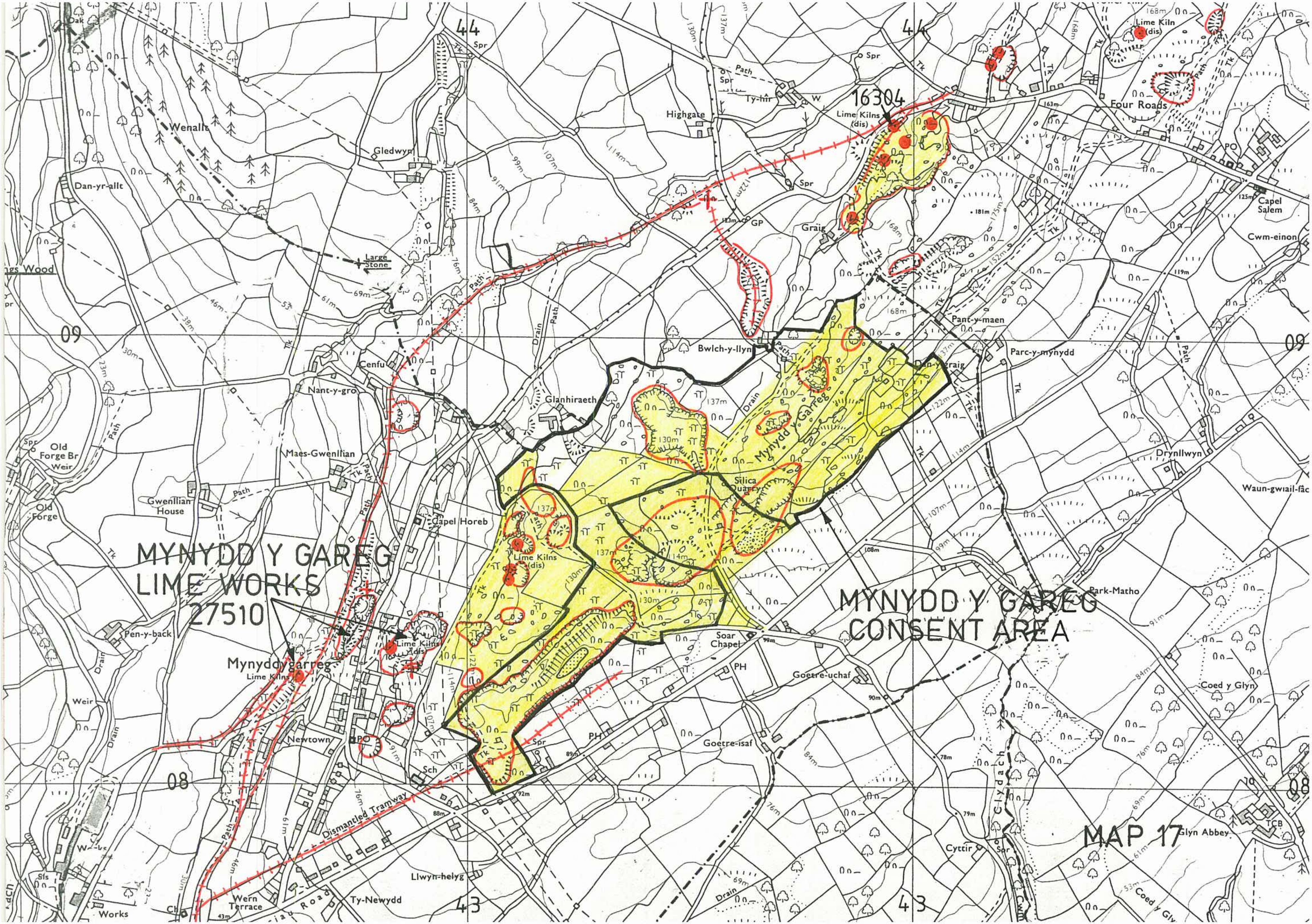

TY'R GARN
CONSENT AREA
27571
27173
GARNBICA
CONSENT AREA
MAESDULAIS
CONSENT AREA
27319
632
633
634
635
27775
GARN CONSENT
AREA
MAP 13
Rhyd-yr-eirin
Gro-gwynion
Garnbica Quarry
Maes-Dulais Factory
Mansel Arms
Banc-y-mansel
Pentre
Maes-Dulais
Maesdulais Quarry
Malvern Vill
Dan-yr-allt
Nant-y-gleisiad
Garn
Limekiln (Disused)
Torcoed Quarry Farm
Ty'r-garn
Garn-ffrwd
Brynefa
Pentre-Sare
Pant-y-ffynnon
Ale-lâs
Dan-y-lan
Maes-y-coed
Cae-gwyn
Garn-bwll
Bryn-tawel
Capel
Garn Quarry (Silica)
Mynydd Cerrig
Bane-y-ddraenen
Llwyn-y-fainc
Pant-y-fail
Wern Lodge
Wern-isaf
Wern-uchaf
Woodlands Terrace
Maes-teg Villas
Pant-teg
Pant-gwyn
Club
Gors
Glyn-caled
Tan-y-graig
Bryn-celyn
Mynydd Cerrig School
Gwâg-Farm
Llethr-garw
Isgoed
Capel
Twr-mawr
Berllan
Bryn-hawddgar
Bryn-teg
Playing Field
Bryn-crwn
Waunfawr
Efail-fâch
Bedw-bâch
Pen-lan-fawr
Llygad-yr-haul
Tal-sarnau
Rhyd-olau
Aber-gefryn
Clos-uchaf
Oddolwerdd
Bro-dawel
Pen-lan-fâch
Rhydybiswel
Seion Road
50
51
52
14
13

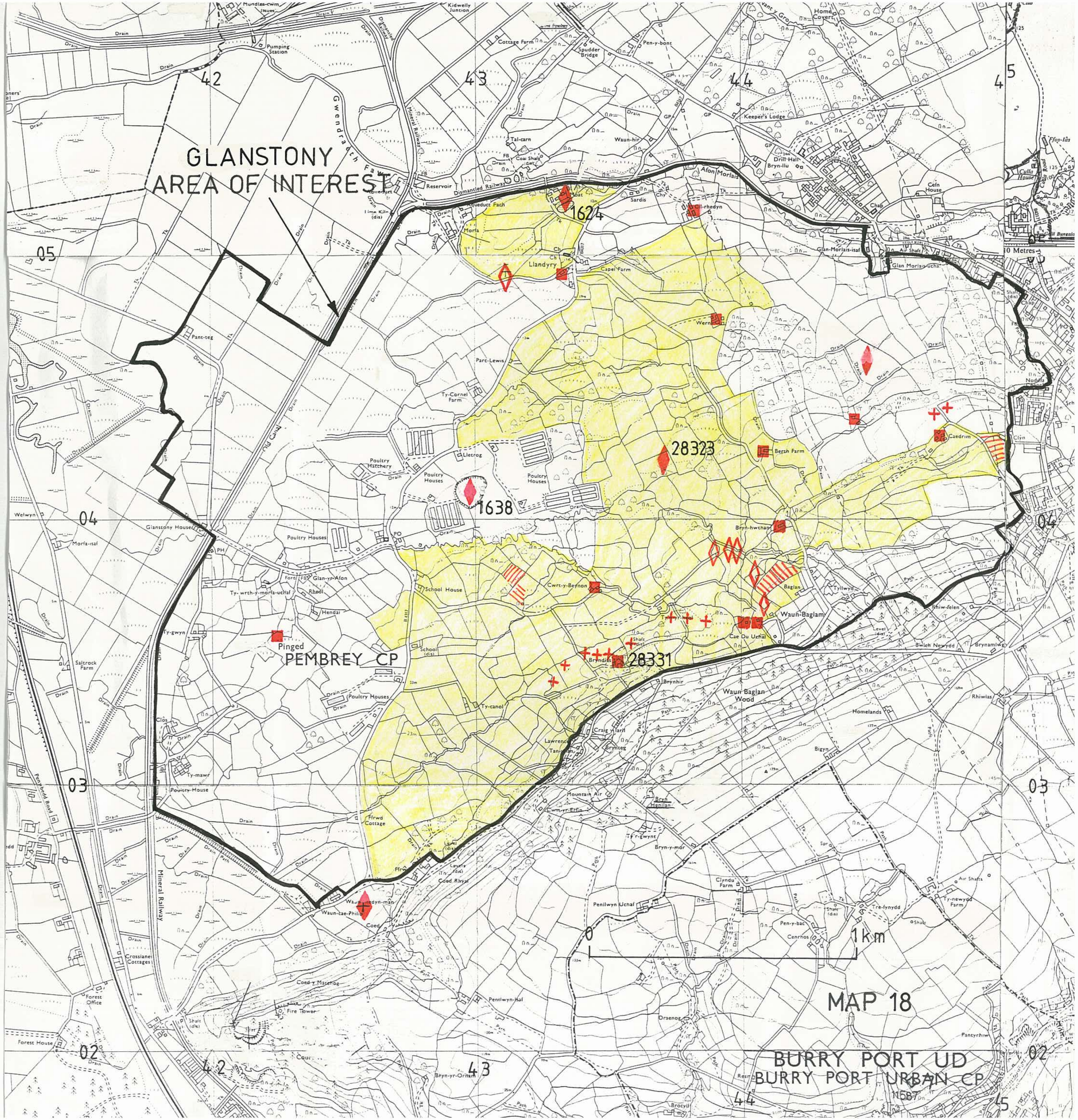

TORCOED CONSENT AREA
TORCOEDFAWR CONSENT AREA
CRWBIN CONSENT AREA
Torcoed Fach
Torcoed Uchaf
Torcoed Fawr
Torcoed Quarry
Torcoed Quarry Farm
Crwbin Quarry (Limestone)
Torcoedfawr Quarry (Limestone)
Mynydd Llangyndeyrn
Bwrdd Arthur Burial Chamber
1697
1695
1698-9
1694
1693
7712
7710
Bryn-tawel
Capel
Garn Quarry (Silica)
Careg-eiddin
Clos-yr-yn
Reservoir (covered)
Glanhiraeth
Castell-cwby
Ty-canol
Afon Berem
Waunfawr
Blaen-gain
Rockview
Rhydhowell Fawr
Meiros Hall
Ysguborwen
Rhydybiswel
Waundo
Ysgubor-fach
Ffrwd-gain
Lan
LLANDDAROG CP
MAP 14

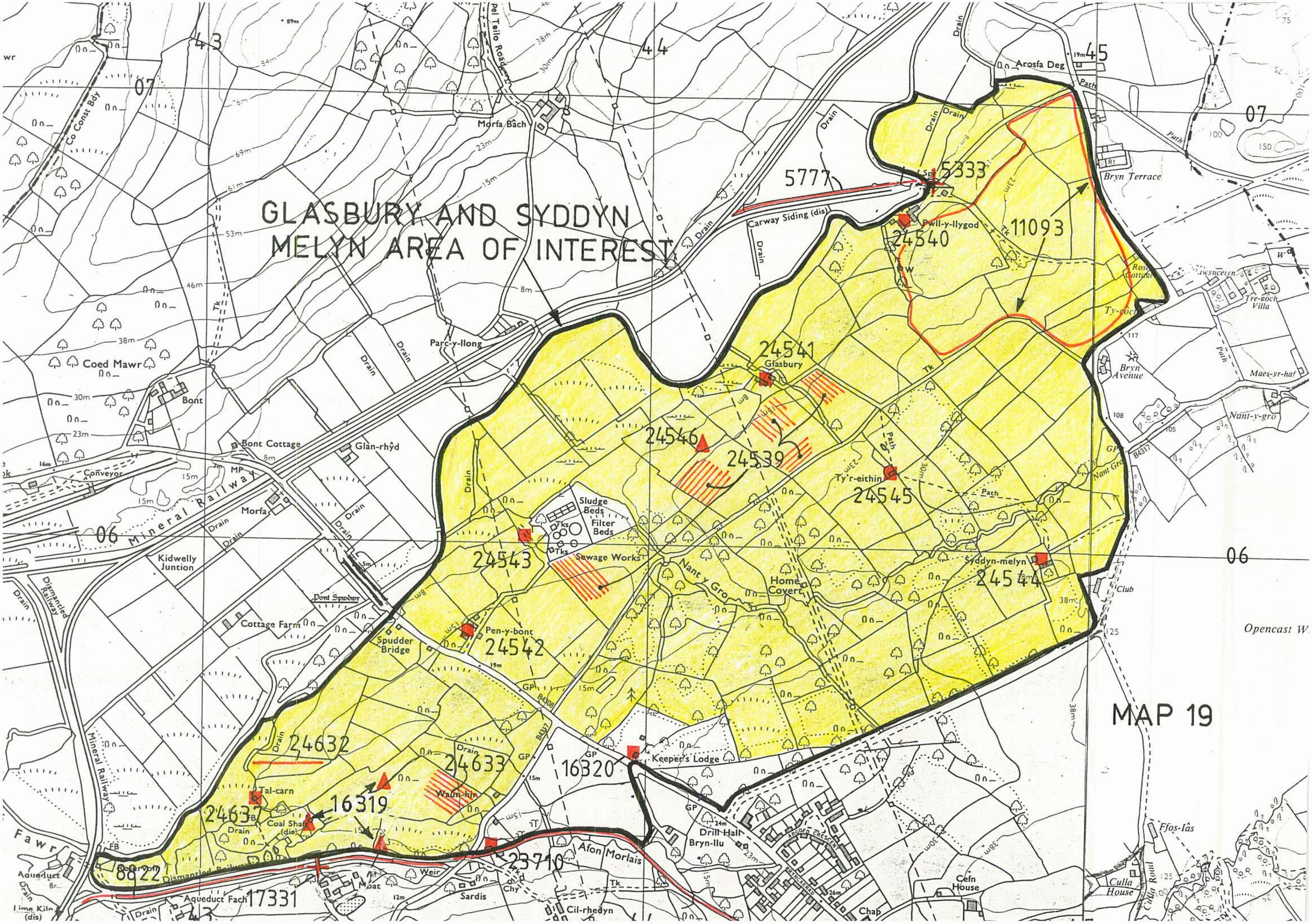

LIMESTONE HILL
CONSENT AREA
27196
MAP 15
Crwbin
Mynydd Llangyndeyrn
Torcoedfawr Quarry
(Limestone)
Crwbin Quarry
(Limestone)
Limestone Quarry
Lime Kilns
(disused)
Capel Dyddgen
Farm
Sychnant
Llwyn Bustach
Henblas
Blaen-gain
Rockview
Rhydhowell
Fawr
Meiros Hall
Rhydhowel Fach
Ysguborwen
Glanhiraeth
Ty-canol
Clos-yr-yn
Tygwyn
Reservoir
(covered)
Pen-y-banc
Pant-teg
Ynys-faes
Tor-coed-isaf
Ffrwd-gain
Ffrwd-wen
Lan
Ysgubor-fach
Coity
Silver Grove
Ty'r bocs
Capel
Bryngwyddil
Quarries
(disused)
Pantyrhin
Gwndwn Mawr
School
Hall
Cattle
Grid
B4306
47
48
13
12

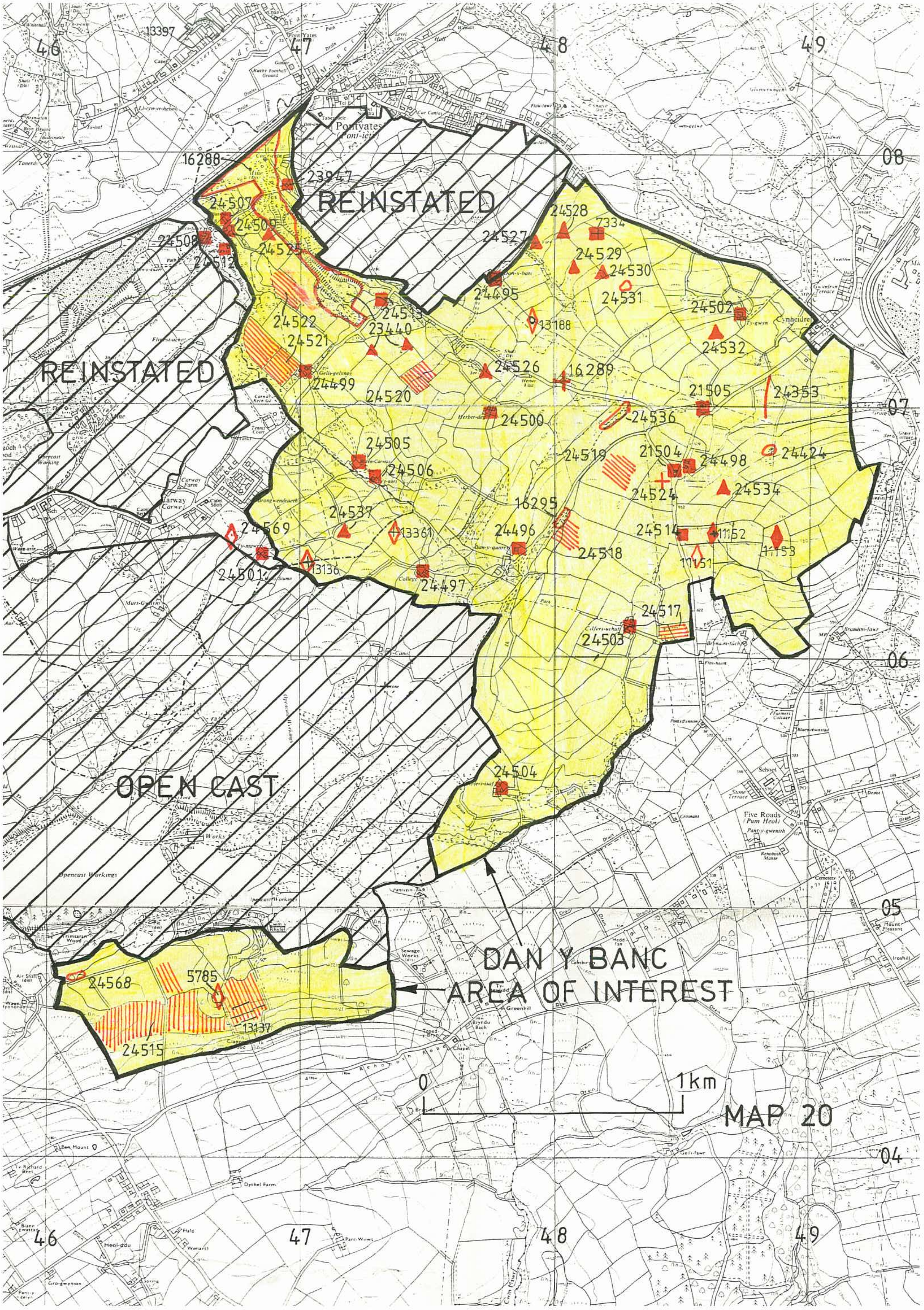


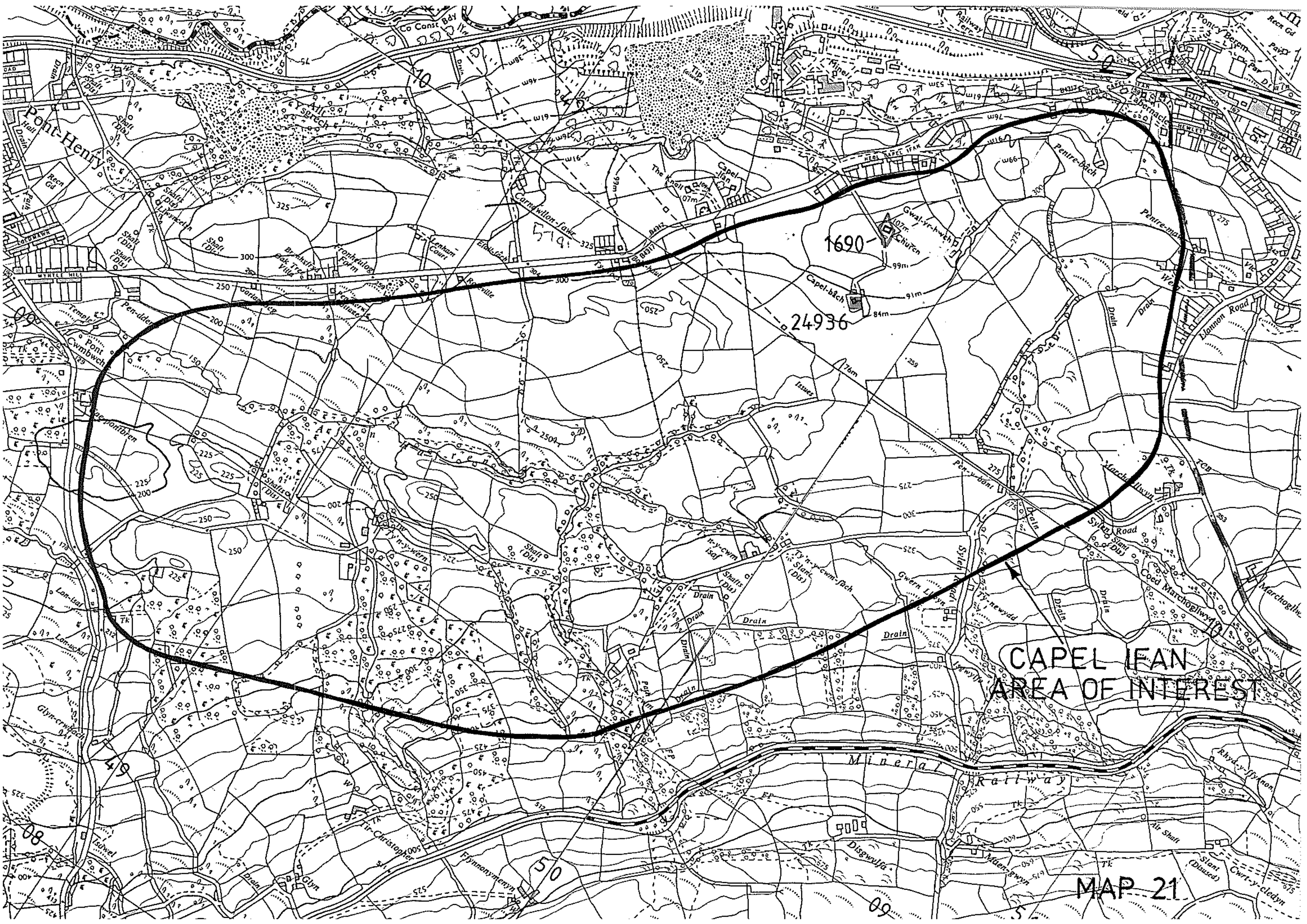
BLAENYFAN
CONSENT AREA
MAP 16
10729
Blaenyfan Quarry (Limestone)
Kiln House
Four Roads
Greenhall
Tower Hill
Lime Kiln (dis)
Penlan
Hengoed
Bwlchwythaint
Van Farm
Llwynffynnon
Llwyncrag
Brynsych
Dolcoed
Danrallt
Blaenmeillion
Pantymeillion
Llancwm
Tsgubor-uchaf
Waun-regwm
Ty-cam
Llwyn-y-filwr
Blaen-y-fan
Cae'r-arglwyddes
Floswilkin
Reservoir
Blaen-lleinau
Meinciau-bach
Meinciau-mawr
Meinciau
Capel Moreia
Bryn Moriah
Cwm-einon
Capel Salem
Bryn-gwyn
Bryn-coch
Ford
Heol Mansant
Cae-gwyllt
Panr-y-pwll
Cwm-y-fanaths

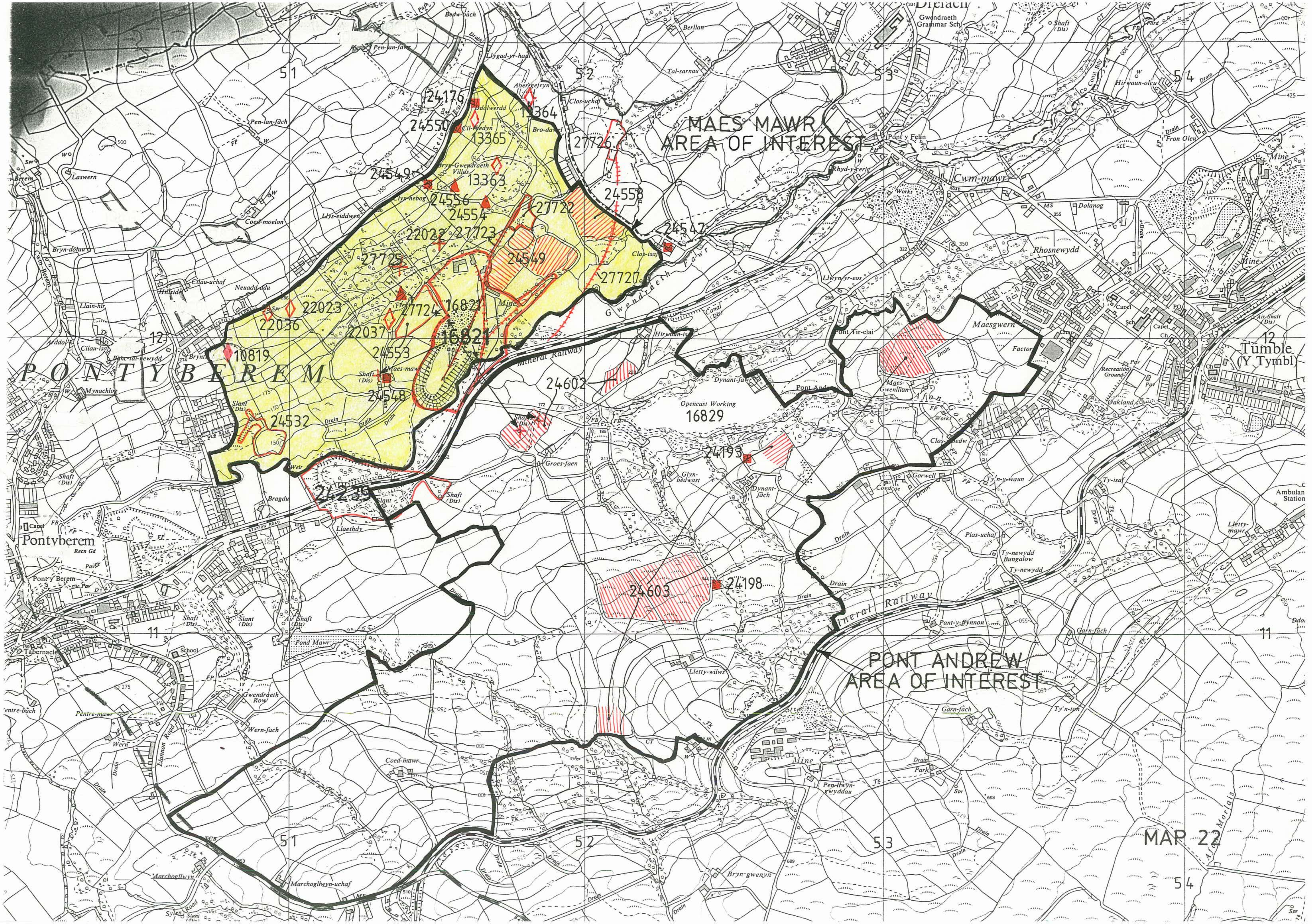

MYNYDD Y GAREG
LIME WORKS
27510
16304
MYNYDD Y GAREG
CONSENT AREA
MAP 17
Lime Kilns (dis)
Lime Kiln (dis)
Mynyddygarreg
Lime Kilns
Silica Quarry
Mynydd y Garreg
Four Roads
Highgate
Ty-hir
Gledwyn
Wenallt
Dan-yr-allt
Large Stone
Graig
Capel Salem
Cwm-einon
Pant-y-maen
Parc-y-mynydd
Bwlch-y-llyn
Dan-y-graig
Glanhiraeth
Cenfu
Nant-y-gro
Maes-Gwenllian
Old Forge Br
Weir
Old Forge
Gwenllian House
Capel Horeb
Drynllwyn
Waun-gwiail-fâch
Park-Matho
Soar Chapel
Goetre-uchaf
Goetre-isaf
Coed y Glyn
Pen-y-back
Newtown
Dismantled Tramway
Llwyn-helyg
Ty-Newydd
Wern Terrace
Works
Cyttir
Glyn Abbey
Clydach
Coed y Gly
Works
44
09
08
43


GLANSTONY
AREA OF INTEREST
1624
1638
28323
28331
PEMBREY CP
0
1km
MAP 18
BURRY PORT UD
BURRY PORT URBAN CP
42
43
44
45
05
04
03
02
Pinged
Glanstony House
Llandyry
Wern
Bersh Farm
Caedrim
Bryn-hwchan
Cwrt-y-Beynon
Baglan
Waun-Baglam
Cae Du Uchaf
Bryndias
Waun Baglan Wood
Ty-canol
School House
Ffrwd Cottage
Mineral Railway
Old Canal
Gwendraeth Fawr


GLASBURY AND SYDDYN MELYN AREA OF INTEREST
MAP 19
5777
5333
24540
11093
24541
24546
24539
24545
24543
24544
24542
24632
24633
16320
24637
16319
23710
8622
17331
Glasbury
Pwll-y-llygod
Carway Siding (dis)
Bryn Terrace
Arosfa Deg
Morfa Bach
Parc-y-llong
Coed Mawr
Bont
Bont Cottage
Glan-rhŷd
Conveyor
Mineral Railway
Morfa
Kidwelly Junction
Dismantled Railway
Cottage Farm
Pont Spwdwr
Spudder Bridge
Pen-y-bont
Sludge Beds
Filter Beds
Sewage Works
Nant y Gro
Home Covert
Ty'r-eithin
Syddyn-melyn
Keeper's Lodge
Tal-carn
Coal Shaft (dis)
Waun-hir
Drill Hall
Bryn-llu
Afon Morlais
Aqueduct Fach
Sardis
Cil-rhedyn
Cefn House
Culla House
Ffos-lâs
Opencast W
Bryn Avenue
Maes-yr-haf
Nant-y-gro
Tre-goch Villa
Ty-coch
Club
Lime Kiln (dis)
Aqueduct
Co Const Bdy
Drain
Path


REINSTATED
REINSTATED
OPEN CAST
DAN Y BANC
AREA OF INTEREST
MAP 20
0
1km
46
47
48
49
08
07
06
05
04
16288
23947
24507
24509
24508
24525
24512
24522
24521
24513
23440
24499
24520
24528
7334
24527
24529
24530
24531
24495
13188
24526
16289
24500
24502
24532
21505
24353
24536
24519
21504
24498
24424
24534
24524
24505
24506
24537
13361
16295
24496
24518
24514
11152
11153
11151
24569
24501
13136
24497
24517
24503
24504
24568
5785
13137
24515
13397


CAPEL IFAN
AREA OF INTEREST
1690
24936
Pont-Henry
Capel Ifan
Gwal-yr-hwch
Church
Capel-bach
Pentre-bach
Pen-y-bont
Marchoglwyn
Coed Marchoglwyn
Sylen Road
Tabernacle
Ty'n-y-wern
Tir-Christopher
Ffynnonymenyn
Glyn
Disgwylfa
Mineral Railway
Pont Cwmbwch
Carnawllon-fawr
Pentre-mawr
Llannon Road
Tyn-newydd
Gwern Llwyn
Cwrt-y-cledyn
Rhyd-y-ffynnon
MAP 21



MAES MAWR
AREA OF INTEREST
PONT ANDREW
AREA OF INTEREST
MAP 22
PONTYBEREM
Pontyberem
Tumble
(Y Tymbl)
Drefach
Gwendraeth Grammar Sch
Opencast Working
16829
24176
24550
13364
13365
27726
24549
13363
24556
24554
27722
24558
24542
22023
27723
27725
24549
27727
22023
22036
27724
16821
22037
16821
24553
10819
24548
24532
24602
24239
24193
24603
24198
Mineral Railway
Gwendraeth Fawr
Cwm-mawr
Rhosnewydd
Maesgwern
Pont Andrew
Dynant-fach
Groes-faen
Glyn-bedwast
Gorwell
Llaethdy
Bragdu
Pond Mawr
Coed-mawr
Wern-fach
Gwendraeth Row
Marchoglwyn-uchaf
Bryn-gwenyn
Garn-fach
Plas-uchaf
Pant-y-Bynnon
Llety-wilws
Pen-llwyn-gwyddau
Laswern
Coed-moelon
Llys-eiddwen
Bryn-dolau
Pen-lan-fach
Pen-lan-fawr
Bedw-bach
Llygad-yr-haul
Berllan
Tal-sarnau
Pont y Felin
Rhyd-y-ceirw
Dolanog
Hirwaun-oleu
Fron Oleu
Clos-isaf
Clos-uchaf
Bro-dawel
Llwyn-yr-eos
Maes-Gwenllian
Oakland
Recreation Ground
Ambulance Station
Llety-mawr
Ty-newydd Bungalow
Ty-newydd
Ty-isaf
Garn-fach
Ty'n-y-waun
Coedcae
Dynant-fach
Hirwaun-isaf
Pont Tir-clai
Llain-hir
Cilau-isaf
Cilau-uchaf
Neuadd-ddu
Arddol
Mynachlog
Pentre-mawr
Wern
Llannon Road
Marchoglwyn
Tabernacle
School
Pont y Berem
Recn Gd
51
52
53
54
12
11

ROCK CASTLE WEST AND BLAEN-Y-GLYN AREA OF INTEREST

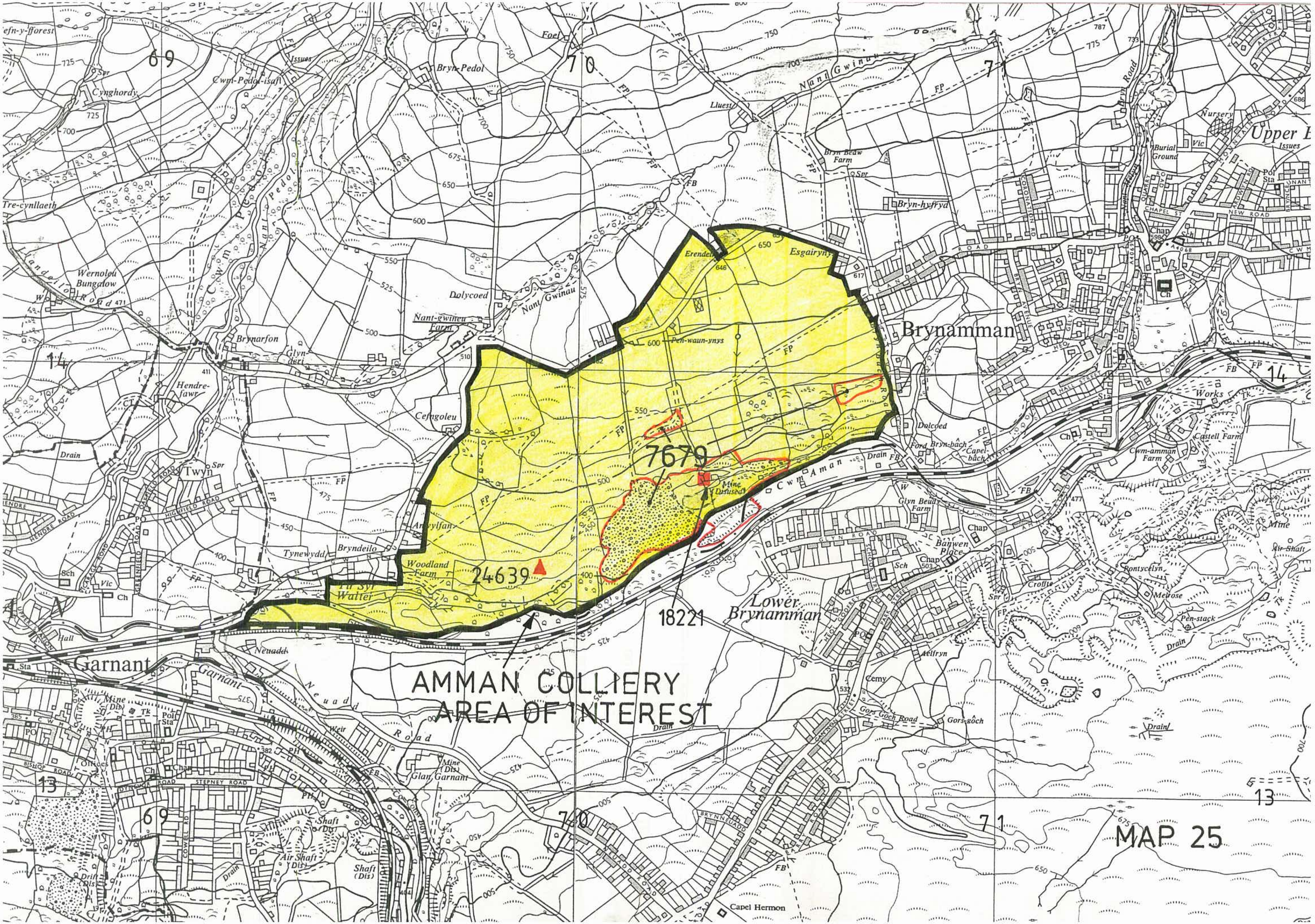
REINSTATED

REINSTATED

MAP 23

CATHLAS
AREA OF INTEREST

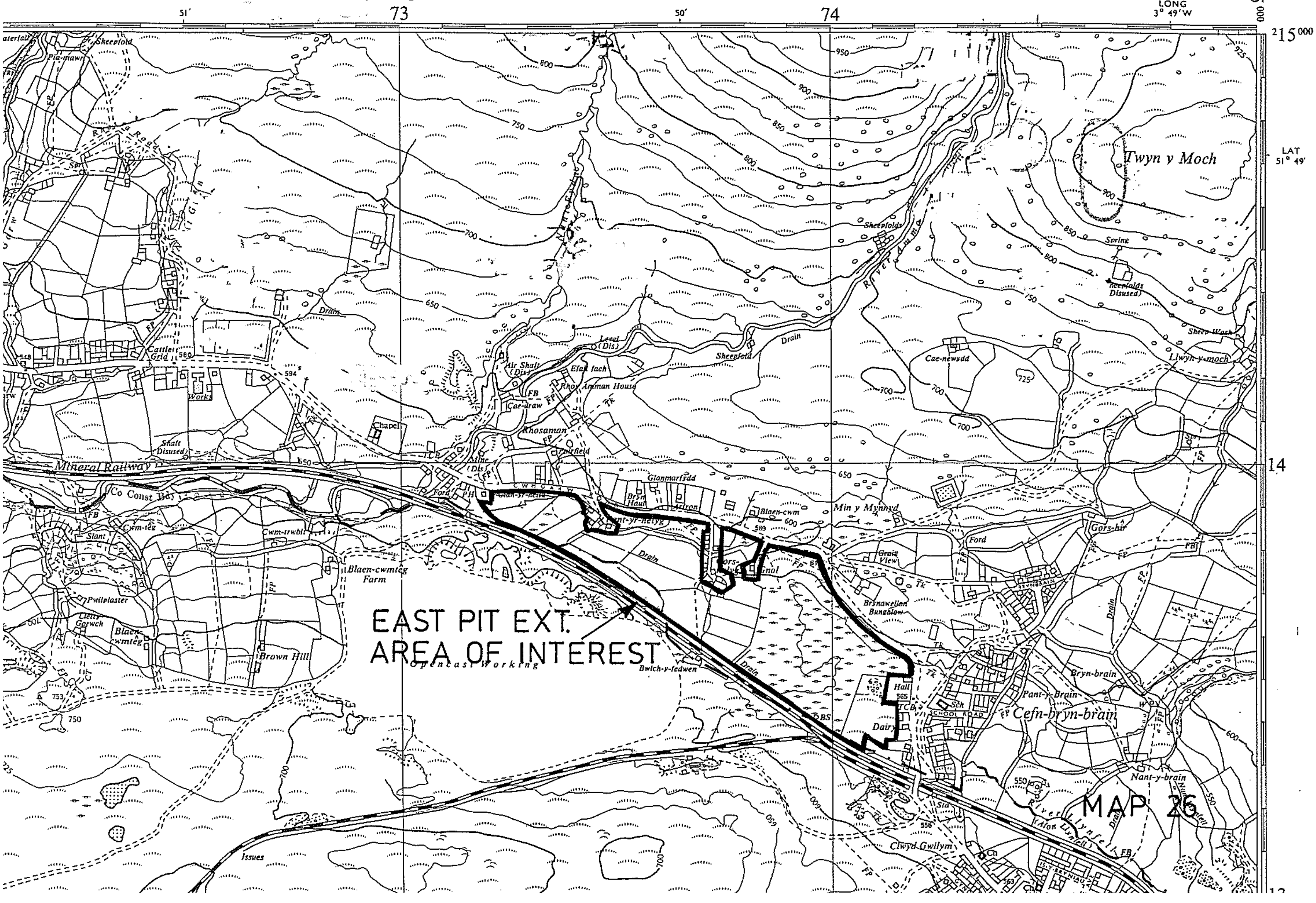
MAP 24

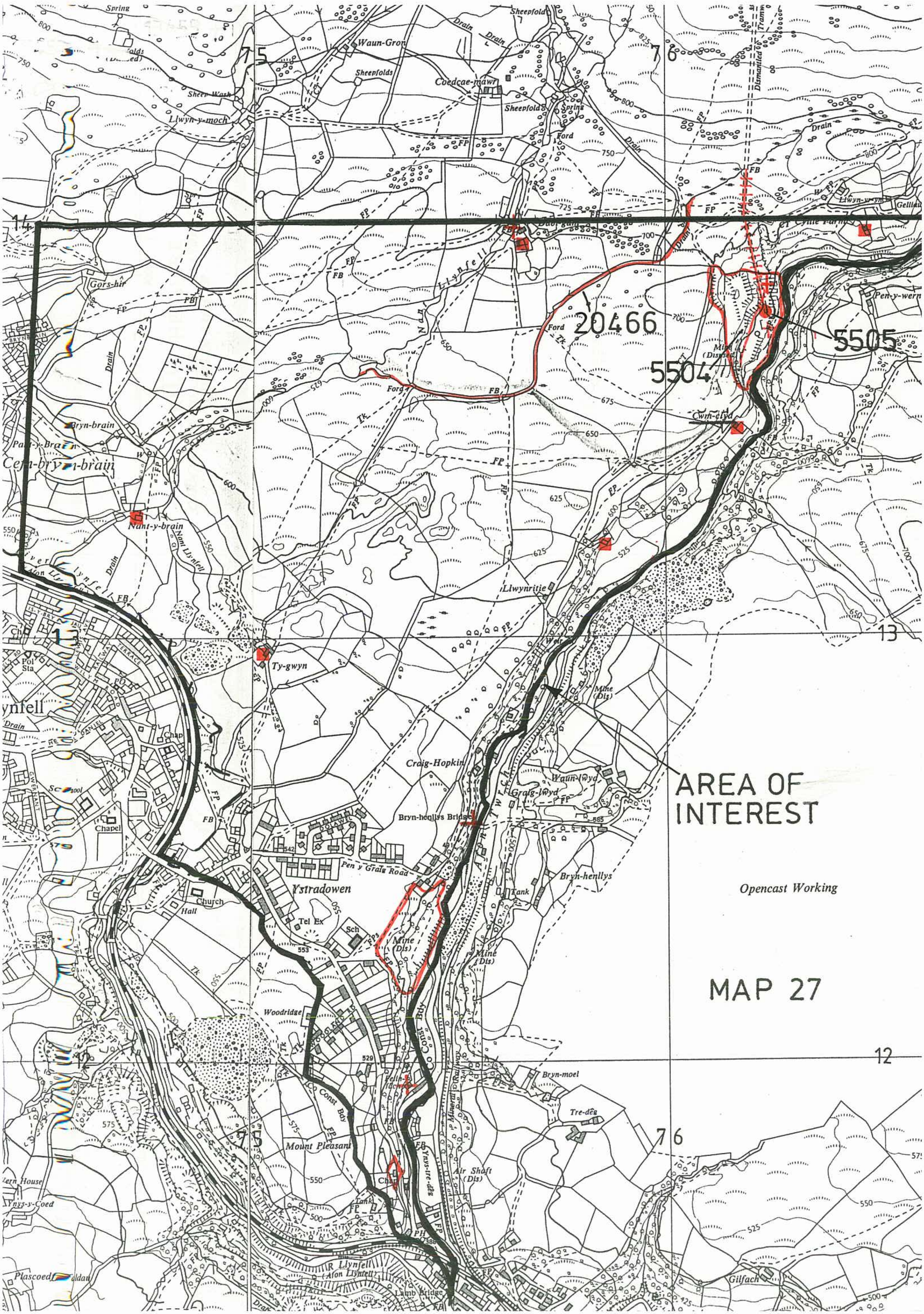


AMMAN COLLIERY
AREA OF INTEREST
MAP 25
7679
24639
18221
Brynamman
Lower Brynamman
Garnant
Upper B
Cwm Aman
Mine Disused
Esgairynys
Pen-waun-ynys
Woodland Farm
Bryndeilo
Tynewydd
Twyn
Hendre-fawr
Brynarfon
Cefngoleu
Nant-gwineu Farm
Dolycoed
Bryn-Pedol
Cwm-Pedol-isaf
Cynghordy
Tre-cynllaeth
Wernoleu Bungalow
Lluest
Bryn Beudy Farm
Bryn-hyfryd
Nant Gwinau
Nant Pedol
Foel
Glyn Beudy Farm
Banwen Place
Pontycelyn
Cwm-amman Farm
Castell Farm
Pen-stack
Gors-goch
Capel Hermon
Glan Garnant
Neuadd Road

CARMARTHENSHIRE

LLANDEILO RD
QUARTER BACH PH





20466
5505
5504
AREA OF INTEREST
MAP 27
Opencast Working
Waun-Gron
Coedcae-mawr
Sheepfold
Sheepfolds
Spring
Ford
Drain
Llwyn-y-moch
Sheep Wash
Gors-hir
Bryn-brain
Cefn-bryn-brain
Nant-y-brain
Pen-y-wern
Cwm-clyd
Mine (Disused)
Llwynrhie
Ty-gwyn
Craig-Hopkin
Waun-lwyd
Craig-lwyd
Bryn-henllys Bridge
Bryn-henllys
Pen y Graig Road
Ystradowen
Church
Hall
Tel Ex
Sch
Chapel
Woodridge
Mount Pleasant
Bryn-moel
Tre-dea
Air Shaft (Dis)
Ynys-y-Coed
Plascoed
Gilfach
Lamb Bridge
R Llynfell (Afon Llynfell)
Co Const Bdy
Tank
Weir