THE CLWYD-POWYS ARCHAEOLOGICAL TRUST

Planning Application for the Modification of the Western Screening Mound and Minor Quarry Extension, Pant Quarry, Halkyn, Flintshire

ARCHAEOLOGICAL ASSESSMENT

CPAT Report No 733

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ARCHAEOLOGICAL ASSESSMENT

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October 2005

Report for Tarmac Ltd

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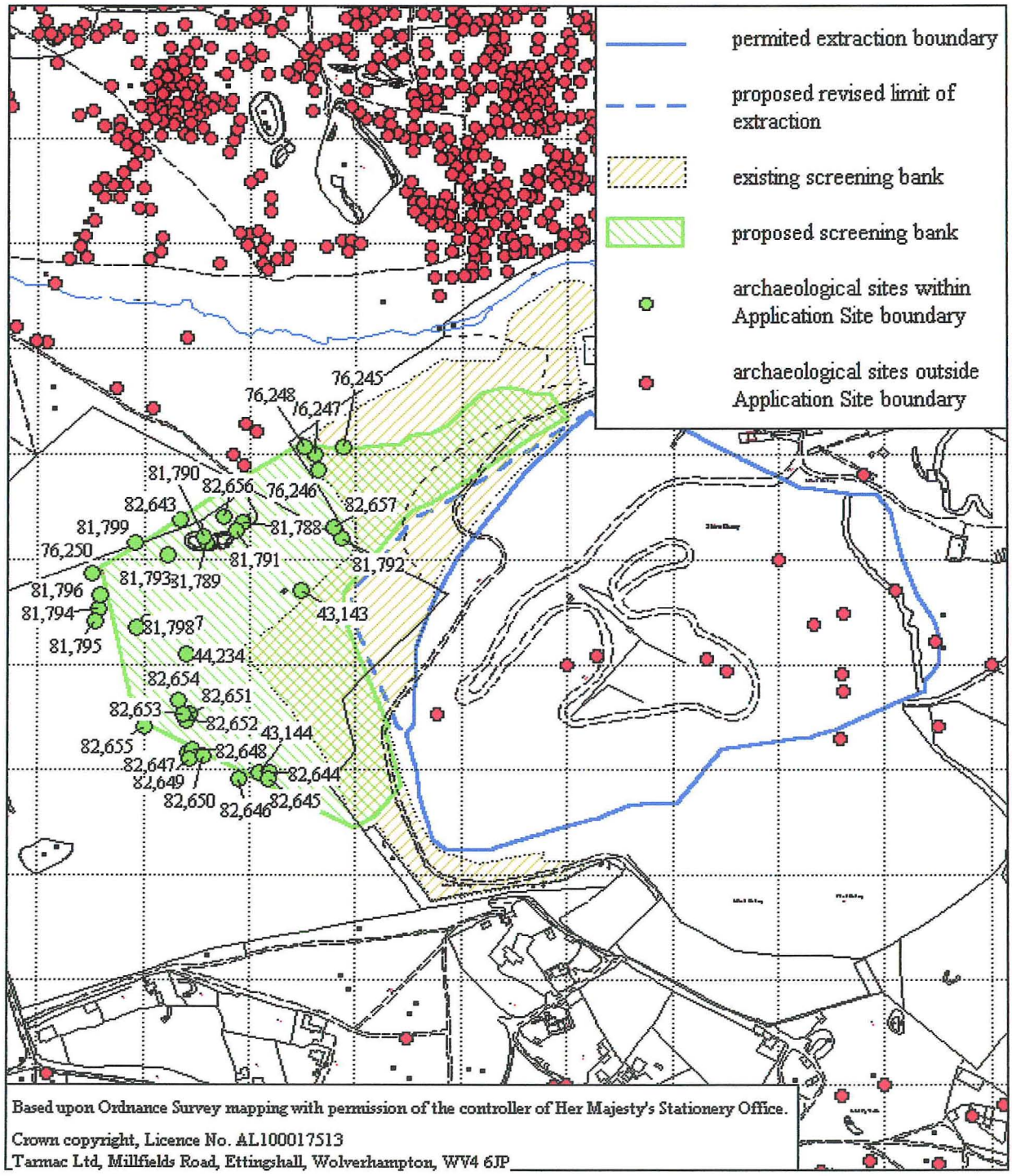

Fig. 1 Pant Quarry: Archaeological sites and Application Boundaries

1 INTRODUCTION

1.1 In August 2005 the Field Services Section of the Clwyd-Powys Archaeological Trust (henceforward CPAT) was asked by Tarmac Ltd to conduct an archaeological and historic landscape assessment in connection with a planning application at Pant Quarry at Halkyn in Flintshire (SJ 2000 7030). The Application is for the modification of the Western Screening Mound in order to allow a minor Quarry extension.

1.2 The objectives of the archaeological assessment are to provide baseline conditions for the proposed development, and recommend appropriate mitigation where that development impacts on the archaeological resource. The assessment of the impact of the proposed development on the historic landscape forms the subject of a separate statement (CPAT Report no 734).

1.3 The western area of Pant Quarry has already been the subject to two phases of archaeological investigation by CPAT in connection with an earlier planning application to construct the present screening mound (Jones *et al.* 1998; Jones 2000). The present Application Site extends beyond the western boundary of these earlier studies. The present statement draws on those earlier reports as required, but to avoid unnecessary duplication reference is made to them from time to time.

2 METHODOLOGY

2.1 The first stage of the assessment consisted of a desk-top study comprising a re-examination and re-assessment of the previous reports. Those earlier reports considered readily available primary and secondary documentary, cartographic, and aerial photographic sources in the following repositories: the Regional Historic Environment Record (HER), the Sites and Monuments Record, held by CPAT at Welshpool; the National Monument Record (NMR) of the Royal Commission on Ancient and Historical Monuments (RCAHMW) at Aberystwyth; the National Library of Wales (NLW), also in Aberystwyth; and the Flintshire Record Office, at Hawarden (CROH) in Flintshire. Further map examination was undertaken at the Flintshire Record Office for the present report, involving examination of relevant maps in the Grosvenor (Halkyn) collection, courtesy of His Grace, the Duke of Westminster.

2.2 In addition to the above, published works were examined for relevant information. These included the journal of the Flintshire Historical Society and works relating to the mining history of the area.

2.3 Following completion of the desk-top study, a field survey of the area of the Application Site was undertaken. This was intended both to evaluate the survival, nature, and possible dating of features revealed by the desk-top study, and to prospect for previously unknown sites.

3 HISTORICAL BACKGROUND

3.1 The archaeological evidence relating to the assessment area and its surroundings is analysed within this section and has been divided into mining and non-mining categories for ease of reference. A detailed gazetteer of the archaeological sites present within the Application Site (Appendix 1) is given below. A glossary of terminology is provided in Appendix 2.

3.2 **Mining evidence**

3.2.1 The most important lead and zinc orefield in Wales lies in the upland region between the Clwydian Mountains and the Dee Estuary. The area, generally known as Halkyn Mountain, forms part of the Carboniferous Limestone Belt which runs south from Prestatyn to Hope Mountain and the northern side of the Bala Fault. The present study area is part of the intensive workings on Halkyn Mountain which fall into the category of an Historic Mining Landscape.

3.2.2 Halkyn mining landscape forms the southern extent of an area of continuous workings, which extend south-east from Gorsedd to Moel y Gaer Hillfort (PRN 100296). The central areas of the ancient common, which once covered nearly 810 hectares, comprise dense concentrations of shafts forming rows of workings following generally trending east/west veins and north/south cross-cuts.

3.2.3 The area bears valuable evidence for one of the oldest industries in north-east Wales, dating from at least the Roman period. Convincing evidence of the precise location of the areas on Halkyn Mountain worked for lead by the Romans has yet to be established. Archaeological evidence suggests that the ore may have been carted from the mountain to the shores of the Dee estuary for smelting during the Roman period. Excavation in the Pentre Oakenholt area of Flint (O'Leary *et al.* 1989) has provided evidence of lead smelting, presumably from ores gained from Halkyn mines.

3.2.4 Documentary evidence for lead extraction is spasmodic until the late 17th century although mining certainly took place as early as the 13th century, when lead was in demand for roofing the newly constructed Edwardian castles (Williams 1994, 62). The Black Prince's Registers of the *c.*1350s record the codes of law and privileges of the freeminers of Englefield, which encompassed the Holywell-Halkyn area. In 1634, Charles I granted to Sir Richard Grosvenor all the mines of lead in the hundreds of Coleshill and Rhuddlan, and thus the Grosvenor Estate became the owners of extensive mineral rights, which included Long Rake and most of the richest veins in the north-east Wales orefield.

3.2.5 The London Lead Company, or the Quaker Company as they were more commonly referred to, became involved with mining in Flintshire from *c.*1695. In 1698 they were already involved in disputes with the Grosvenor Estate over mining on Old Rake, Halkyn (PRN 18146), one of the richest veins on the mountain. Rich ore was being wound up in baskets at Old Rake and Long Rake, where by 1701 they had a building which include a smithy, count-house, store room for ore, lodging for their agent and a chimney to provide heating for the convenience of the miners in winter. The Quakers brought about a more organised form of mining to the mountain; dressing of ore was taking place at the mine and ore being carted to their new smelting-house at Gadlys, which was in production by 1704. The company worked on Halkyn for *c.*100 years, introducing several technological innovations such as a windmill for pumping out water and winding ore at Pant-y-pwll-dwr Rake, followed later by the installation of a Newcomen Engine House by 1729, one of the first of seven to be installed by them on Halkyn. The Quaker interests on Halkyn included Old Rake, Long Rake, and Moel-y-crio (PRN 18130) and recorded shafts were already sunk to *c.*60m depth by the 1720s (Bevan-Evans 1960; 1961; 1962). These veins were worked intensively from the 17th century and the close proximity of the workings on east to west veins and their cross-courses are best revealed on aerial photographs.

3.2.6 The earliest known map showing Halkyn Mountain in detail, in the Grosvenor Estate collection, was the product of a survey by Thomas Badeslade in 1738, though it survives only in a copy of 1864 (CROH D/GR/1679). It depicts some encroachments on the mountain, and various rakes with the owner or company's name displayed, but not the shafts that were sunk into the loads.

3.2.6 Intensive mining during the medieval period had led to the exhaustion of the surface outcrops by the early 17th century. Deeper mining was more expensive and drainage costs increased as workings sank below the natural drainage level. Several smaller adits were driven by individual companies, but two major drainage tunnels were cut through the mountain. The Halkyn Deep Level Tunnel was driven initially by the Grosvenors in 1818 from Nant-y-Fflint, and in 1875 the tunnel was taken over by the Halkyn District Mines Drainage Company and the mines along its course were re-worked as well as drained. The tunnel drained the mines on the south-east side of the mountain, such as New North Halkyn and Mount Halkyn, before continuing south towards Hendre and Llyn-y-Pandy. In 1897 a group of mine companies formed the Holywell-Halkyn Mining and Tunnel Company and began to drive the Milwr Tunnel from the Dee Estuary at Bagillt. It cut across the centre of the orefield in a north-south direction and eventually reached the Mold Mines by 1957, draining and re-working all the veins along its course.

3.2.7 However, the Badeslade survey and latter mapping from the 18th century seems to show that there was not a great deal of mining activity in the area to the south-east of Rhes-y-cae (and in the vicinity of Pant Quarry) at that time, the foci being a little further to the north and north-east where the major rakes were being exploited.

3.2.8 Pant Quarry does extend across at least part of the site of Moel-y-crio Mine, which worked the western end of the east/west trending California and Pant-y-gof Veins, and entered returns for 1886-1913. The peak period appears to have been 1896, when 12 men were employed underground and four on surface work (Burt et al 1992, 66-7). The mine was later incorporated into the Central Halkyn Mining Company from 1901-1910, when the Moel-y-crio shaft (SJ 2015 6982) was extended to the 198-yard level (Smith 1921, 69). The site of the main shaft is located as a spoil mound to the east side of Mount Cottage beyond the southern boundary of the Quarry. The shaft was unrecorded by the Ordnance Survey in 1869 but appears on the 2nd edition Ordnance Survey map as the main shaft of Moel-y-crio Mine. By 1912 when the 3rd edition appeared, it is recorded with an engine house on its south side and was worked by the Central Halkyn Mining Company.

3.2.9 Smith (1921, 69) records the Pant-y-gof Vein running in a north-easterly direction from Moel-y-crio Mound (PRN 102487) through the Pant-y-gof Mine (PRN 18073) towards the Deep Level Lode and it appears to be located south of the California workings. The Pant-y-ffrith cross-course was worked in a north to south direction intersecting the California and Pant-y-gof Veins (Smith 1921, 71, Fig. 6). The early 19th-century workings on this vein for lead and silver were by the Pant-y-ffrith Company (PRN 18152) but the sett, along with Pant-y-gof and Central Halkyn/Moel-y-crio and New North Halkyn were incorporated into the Halkyn Deep Level Mine (PRN 18092) until 1913. At this time the mines were being drained by the Deep Level Drainage Tunnel driven along the vein and intercepting the Pant-y-gof vein at the east end.

3.2.10 In the northern sector of the Quarry area, the New Westminster Mine main shaft was worked at SJ 2006 7013. The company (1868-9) invested in land not previously mined. One of the veins worked by the Company was the Long Rake. In 1928, Halkyn District United Mines (PRN 18015) took over the earlier setts. The company was the amalgamation of nine old mining companies and two drainage companies. The Deep Level Tunnel was driven from an adit near the Swinchiard Brook (SJ 2290 9110) by the Grosvenor family in 1818. In 1875, when the Halkyn District Mines Drainage Company was formed, the tunnel had been extended southwards and levied royalties on the mines at Halkyn that it drained. A second tunnel, the Milwr Tunnel, was begun in 1897 from Bagillt (SJ 2140 7600) by the Holywell-Halkyn Mining and Tunnel Company. The

tunnel intercepts the western end of the Pant-y-gof Vein as it crosses the present study area.

3.2.11 Halkyn Mountain today provides much earthwork evidence of this early activity in the form of leats and reservoirs, some still holding water, which would have served the dressing floor areas. Small cottages and mine offices have been converted to modern dwellings and the stonework foundations of other buildings are visible together with several large horse whim circles. The mine sites in unimproved areas are generally overgrown, and dense vegetation may mask the presence of foundations of engine houses and associated mine buildings such as mine offices, stables, smithies, stores and magazines, together with processing areas, tramways, reservoirs and leat systems and possibly miners' housing. Some of these may be visible perhaps only as grassed-over mounds.

3.2.12 Generally, archaeological evidence in the areas of the most intense workings consists mainly of shallow workings and open-cuts along the veins, signs of prospecting for ore, deeper stone-lined shafts, some ladder shafts and isolated horse whim circles. In the undeveloped areas, the historical value of the landscape is in the workings themselves. They bear evidence of the richness of the veins and cross-courses, where activity was centred on winning and removing the ores rather than dressing them on site. Most of the orefield is common land now returned to rough pasture, which is dissected by a multitude of tracks.

3.2.13 Thousands of shafts were located during the shaft capping programme undertaken in the 1970s by Clwyd County Council. Derelict Land Reclamation Schemes involving shaft capping, infilling and disposal of large-scale waste, have levelled much of the late 20th-century workings, particularly in the area to the south-west of Halkyn Village, which included the workings of Halkyn District United Mines on the Pant-y-gof Vein.

3.3 Non-mining activity

3.3.1 Halkyn common is generally grassland with areas of gorse and bracken on which sheep farming pre-dominates. The parish of Halkyn is mentioned in the Domesday Book and some enclosure and encroachment may have occurred on the common. But most of the small villages and hamlets on the periphery of Halkyn Mountain such as Pentre Halkyn, Halkyn, Moel-y-crio and Rhes-y-cae had their origins in the post-medieval centuries, and particularly from the 18th century onwards. Badeslade's map of 1738, for instance shows that Rhes-y-cae at that time may have consisted of no more than one or two cottages on the common. However, during the second half of the 18th century and into the 19th century, settlement expanded rapidly on the common in line with the increasing exploitation of the lead deposits.

3.3.2 Prehistoric activity in the area is readily apparent and characterised by the multi-period site of Moel-y-gaer, 1.5km to the south-east of Pant Quarry, which was excavated during the 1970s. Evidence revealed during the excavations of the Iron Age hillfort confirmed the additional presence of Neolithic and Bronze Age occupation. Further evidence of Iron Age occupation is provided by the oval enclosure on Moel Ffagnallt, 700m to the west. Finds of the period have also been encountered within the surrounding area. Of particular interest are a hoard of eight vessels, which were dated to the 4th century BC or later and probably made of bronze, found during the sinking of a shaft on Long Rake in the 18th century, just over a kilometre to the north of the Quarry.

3.3.3 As has been noted above in para 3.2.3, there is a possibility that lead had been mined by the Romans on Halkyn Mountain. No definite evidence of occupation or workings from

the period has been encountered, but a possible section of Roman road has been recorded at Old Hall, near Halkyn.

3.3.4 The origins of settlement at Halkyn probably fall in the early medieval (or pre-Norman Conquest) period for the church is referred to in the Domesday Book of 1086, although this was not the present building in the village, but a predecessor in the old churchyard, a short distance away. Further evidence of medieval occupation is provided by the moated site at Pentre Halkyn Hafod Farm, 1.5km to the north-east of the Quarry. Potentially, an area of ridge and furrow cultivation (PRN 82655), indicative of arable cultivation, might be of medieval date, but such is the level of grassland improvement, that this cannot be confirmed. The find of a 12th-century silver coin (Site No 47) near Bryn Siriol was reported during the earlier field survey. It is likely that much of the occupation in the area would have either have been related in some way to, or supported by, the lead mining on Halkyn Mountain.

3.3.5 Post-medieval use of the area, other than the mining is likely to have been relatively unchanged from the medieval period, with small-scale agriculture and associated land-uses. Limestone quarries and kilns demonstrate that lime was being burnt, presumably mainly for local agricultural use. Two smithies, Mount Pleasant smithy and Rhes-y-cae village smithy have been recorded in the neighbourhood, and these would probably have served the local agricultural population in addition to the mining community. A notable residence which was built between 1824 and 1827 in the latter part of the period was Halkyn Castle (PRN 35149), a mansion built by the Grosvenor family as an occasional residence, but mainly used as a sporting lodge. The associated park was apparently laid out in the 1820s with gardens, drives and woodland, and engulfed the old church and churchyard of St Mary's.

3.3.6 Modern utilisation of the area has changed little from that of the post-medieval period. The construction of new homes in the village of Halkyn, and the reclamation of some areas of former mining and processing, has altered the landscape to some extent, and a notable feature of the modern landscape is the increased size of the many limestone quarries, which are present on and around Halkyn Mountain.

4 ARCHAEOLOGICAL SUMMARY

4.1 Each site of archaeological interest, identified during the assessment, has been classified according to its perceived significance. The categories, with the exception of Category E, are based on those given in the Department of Environment, Transport and Regions' *Design Manual for Roads and Bridges* (DMRB) Volume 11 Section 3 Part 2 (1993). Category E is taken from the draft *Archaeology and the Trunk Road Programme in Wales: a Manual of Best Practice* prepared by Cadw: Welsh Historic Monuments (n.d.) which in other respects follows the DMRB volume.

Category A sites are those believed by CPAT to be of primary significance, either potentially of national importance or already designated by CADW: Welsh Historic Monuments as scheduled ancient monuments or listed buildings. It is presumed that sites in this category will be preserved and protected *in situ.*

Category B sites are sites of regional importance. These sites are not of sufficient importance to justify scheduling, but are nevertheless important in aiding the understanding and interpretation of the archaeology of the region. Preservation *in situ* is the preferred option for these sites, but if loss or damage is unavoidable, appropriate detailed recording should be undertaken.

Category C sites are sites of local importance. These sites are of lesser importance, but are nevertheless useful in aiding the understanding and interpretation of the archaeology of the local area. They are not normally of sufficient importance to justify preservation if threatened, but merit adequate recording in advance of loss or damage, or if portable they should be moved.

Category D sites are either sites of minor importance or those which are so badly damaged that too little now remains to justify their inclusion in a higher grade. Rapid recording should be sufficient, but as with Category C sites they should be moved if this is an appropriate strategy.

Category E sites are sites which have been identified, but whose importance cannot be assessed from fieldwork and desk-based study alone. An archaeological evaluation would be required to categorise such a site more accurately if the proposal was likely to affect it in any way.

4.2 The locations of the individual archaeological sites are shown on Figure 1. Tables summarising the archaeology of the study area according to its perceived importance are provided below.

Category A sites

4.2.1 There are no category A sites which have been identified within the Application Site.

Category B sites

4.2.2 There are no category B sites which have been identified within the Application Site.

Category C sites

4.2.3 There are two category C sites which have been identified within the Application Site.

PRN	Name	Type	Period	NGR
43143	Bryn Siriol reservoir	Reservoir	19th century ?	SJ19537027
82655	Pant Quarry Ridge and Furrow	Ridge and Furrow	Medieval?	SJ1940070140

PRN 43143 Pant Quarry, Bryn Siriol reservoir
The site was the subject of a detailed ground survey by CPAT in 2000, prior to the construction of the present screening mound (Jones 2000).

PRN 82655 Pant Quarry Ridge and Furrow
Little of this appears to have survived recent pasture improvement.

Category D sites

4.2.4 There are thirty-three category D sites which have been identified within the Application Site, though not all of these are now necessarily visible on the surface.

PRN	Name	Type	Period	NGR
43144	Pant Quarry, shaft I	Mine shaft	Post-medieval	SJ19517010
44234	Hendrefigillt Mine, building II	Building	Post-medieval	SJ19447021
76245	Halkyn Mountain mine shaft	Mine shaft	Post-medieval	SJ1958870407
76246	Halkyn Mountain mine shaft	Mine shaft	Post-medieval	SJ1956570384
76247	Halkyn Mountain mine shaft	Mine shaft	Post-medieval	SJ1956270400
76248	Halkyn Mountain mine shaft	Mine shaft	Post-medieval	SJ1955270407
76250	Bryn Siriol Shaft V	Mine shaft	Post-medieval	SJ1935270286
81788	Bryn Siriol	Building	20th century	SJ1949370334
81789	Bryn Siriol Shaft I	Mine shaft	Post-medieval	SJ1945870315
81790	Bryn Siriol Sheepfold	Sheepfold	Post-medieval	SJ1945670321
81791	Bryn Siriol Shaft II	Mine shaft	Post-medieval	SJ1958770320
81792	Bryn Siriol Shaft III	Mine shaft	Post-medieval	SJ1958770320
81793	Bryn Siriol Shaft IV	Mine shaft	Post-medieval	SJ1942270304
81794	Bryn Siriol Shaft VI	Mine shaft	Post-medieval	SJ1935770252
81795	Bryn Siriol Shaft VII	Mine shaft	Post-medieval	SJ1935470241
81796	Bryn Siriol Shaft VIII	Mine shaft	Post-medieval	SJ1935970265
81797	Bryn Siriol Shaft IX	Mine shaft	Post-medieval	SJ1940370239
81798	Bryn Siriol Shaft X	Mine shaft	Post-medieval	SJ1939370234
81799	Bryn Siriol Shaft XIII	Mine shaft	Post-medieval	SJ1939170315
82643	Bryn Siriol Shaft XIV	Mine shaft	Post-medieval	SJ1943470337
82644	Pant Quarry Shaft I	Mine shaft	Post-medieval	SJ1951970097
82645	Pant Quarry Shaft II	Mine shaft	Post-medieval	SJ1951770091
82646	Pant Quarry Shaft III	Mine shaft	Post-medieval	SJ1948970091
82647	Pant Quarry Shaft IV	Mine shaft	Post-medieval	SJ1944170116
82648	Pant Quarry Shaft V	Mine shaft	Post-medieval	SJ1944570119
82649	Pant Quarry Shaft VI	Mine shaft	Post-medieval	SJ1944270110
82650	Pant Quarry Shaft VII	Mine shaft	Post-medieval	SJ1945670112
82651	Pant Quarry Shaft VIII	Mine shaft	Post-medieval	SJ1944270152
82652	Pant Quarry Shaft IX	Mine shaft	Post-medieval	SJ1944070147
82653	Pant Quarry Shaft X	Mine shaft	Post-medieval	SJ1943670152
82654	Pant Quarry Shaft XI	Mine shaft	Post-medieval	SJ1943270165
82657	Halkyn Mountain structure	Structure	Post medieval	SJ1957970330

Category E sites

4.2.5 There is only one category E feature which has been recorded within the Application Site, and this is included in this class, solely because there is an absence of corroborative detail.

PRN	Name	Type	Period	NGR
82656	Bryn Siriol Find	Finds Only	Medieval	SJ1947570340

5 IMPACT AND MITIGATION

Impact

5.1 The impact of the proposal on the archaeological resource, as recorded above, will be permanent. Even if the proposed Mound were to be removed at some date in the future, the archaeological features that were sealed by it during its construction, would be either levelled, or compacted or fundamentally disturbed, and would be unlikely to survive in a recognisable form. It is the contention of this report that to all intents and purposes they should be considered as if they were being permanently removed from the landscape.

Mitigation

5.2 A range of mitigation measures are available for consideration in advance of developments of the type reported on here. They are normally categorised as follows:

5.2.1 *Preservation in situ:* where it is considered that the most appropriate response is the preservation of the site in its present form, condition and location.

5.2.2 *Preservation by record:* where proposals will inevitably lead to the loss of a site sufficient recording should be undertaken to provide a full, accurate and permanent record of its nature, form, significance and dating. Preservation by record can take a number of forms, depending on the nature of the site in question, and may be achieved with or without excavation and could include any or all of the following: written record; drawn record; photographic record; artefactual record; survey; and environmental sampling.

5.2.3 *Evaluation:* where insufficient information exists regarding a site for a decision to be made regarding its future management a programme of investigative work may be proposed. Such investigation may include geophysical survey, topographical survey and trial excavation.

5.2.4 *Excavation:* where the destruction of a significant site is unavoidable, full excavation may be required completely to examine the remains under controlled condition. This is the ultimate form of *preservation by record.*

5.2.5 *Watching brief:* a watching brief may be recommended to include archaeological monitoring of all relevant ground works, including topsoiling, in order to identify and record any previously unknown archaeological remains which may be revealed. Sufficient time must be allowed for adequate recording of any remains that are encountered.

5.3 It is not considered that any of the archaeological features noted in section 4.2 is of sufficient significance to merit *preservation in situ* or *excavation.*

5.4 The one site where specific mitigation is recommended is the reservoir (PRN 43143) which has already been surveyed in detail (Jones 2000, fig 3). During initial groundworks for the proposed Western Screening Mound and prior to the disappearance of the reservoir beneath it, earthmoving machinery should be used to cut a section through the reservoir, under archaeological supervision, to determine its construction and the depth and fill of the reservoir itself. The resulting section should be recorded in as much detail as appropriate by the archaeologist and a report submitted to the regional HER.

5.5 Before groundworks commence, the other archaeological features within the Application Site – the shafts, the bungalow etc – should be photographed and details taken of their size, and shape, where this has not already been done, *i.e Preservation by record.*

5.6 There is also a potential for presently unrecorded sites in the Application Site, because these may not show as earthworks, but may nevertheless may be subject to an impact from the proposal. In order to provide some mitigation for the potential effect of the scheme in this regard, a watching brief is recommended during any topsoil stripping, and in the event that any feature of significance is identified at subsoil level, time and resources allowed for its examination.

6 CONCLUSIONS

6.1 The archaeological assessment has identified a number of sites and features which will be affected by the proposed development, most though not all associated with the mining industry that was such an important feature of Halkyn Mountain for several centuries.

6.2 While it cannot be assumed that all of these features will be totally destroyed during the initial groundworks for the Western Screening Mound, it is highly unlikely that their submergence and compaction beneath the Mound will allow them to be restored to their original condition if at some time in the future the Western Screening Mound were to be removed. It is therefore recommended that a limited amount of recording be undertaken on these archaeological features prior to and during the initial groundworks to ensure their preservation by record.

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8.2 Documentary Sources

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1723 article of agreement of 21 year lease of lands in Halkyn. (CROH D/HE/213)
1733 agreement re: payment of shares for maintenance of a fire engine at Pentre and Maeslygan mines (CROH D/HE/227)
1735 Lease of mines in Halkyn. (CROH D/HE/228)

Not accessed
Grosvenor (Halkyn) Manuscripts in Flintshire Record Office, Hawarden (CROH)
D/GR/106 Lease of lead mines dated 25/9/1730.
D/GR/144 Lease of lead mines dated 7/11/1864.
D/GR/150 Lease of lead mines dated 1/12/1897.
D/GR/151 Lease of lead mines dated 20/4/1901.
D/GR/290 Lease of limestone at Pant Quarry dated 19/9/1904.
D/GR/291 Lease of limestone at Pant Quarry dated 5/2/1907.
D/GR/292 Lease of quarries of sand & gravel (at Moelycrio) dated 21/1/1908.
D/GR/659 Correspondence & papers concerning the Central Halkyn Mining Co. in Moelycrio area (1901-10).
D/GR/1780 sketches of mines at Moel y Gaer, Moelycria, & Silver Rake (Halkyn) (Early 18th century).

National Library of Wales (NLW)
NLW Minor 1425B. Document relating to New North Halkyn Lead Mines.
NLW J.R.Hughes Deposit. Vol.1, p.8, doc.33. Volume of papers re. Halkyn District Mines Drainage Act, 1913

8.3 Cartographic Sources

Accessed
1738 D/GR/1679 Map of Halkyn Mountain (copied in 1864 from an original map of 1738)
c.1750 D/GR/1681 Map of Halkin Mountain.
1796 D/GR/1685 Map of Halkin Hall demesne and several other farms in Halkin and Northop.
1799 D/GR/1688 Plan of Halkin Mountain.
1804 D/GR/1694 Plan of encroachments on the waste lands in the parishes of Halkin and Northop.
c.1820 D/GR/1718 Plan of ground in the parishes of Halkin.....leased to the Halkin Mine Co....
c.1820 D/GR/1718 Plan of ground in the parishes of Halkin.....leased to the Halkin Mine Co.
1834-5 Ordnance Surveyors 2" drawings (uncopiable).
c.1838 D/GR/1710 Sketch plan of .....and part of Halkyn mountain.

1839 Halkyn Tithe Map and Apportionment (NLW A/C 993)
1846 D/GR/1714 Rough draft of an estate in the parishes of Halkin.....
Mid 19th Century D/GR/1725 Halkyn and Northop common.
1861 D/GR/1734 Copy plan of Halkyn mountain.....
1861 D/GR/1735 Plan of lands in .....& Halkyn.....
1862 D/GR/1736-7 Plan of land on Halkyn mountain.....
1875 Ordnance Survey 1st edition 1:2,500 map, Flintshire Sheet 9.6
1877 Ordnance Survey 1st edition 1:2,500 map, Flintshire Sheet 9.10
1900 Ordnance Survey 2nd edition 1:10,560 Flintshire Sheet 9 SW
c.1900 D/GR/1858 Plan showing Halkyn drainage tunnels & mines located therein.
1912 Ordnance Survey 3rd edition 1:2,500 map, Flintshire Sheet 9.6
1912 Ordnance Survey 3rd edition 1:2,500 map, Flintshire Sheet 9.10
1964 Ordnance Survey 1:2,500 map, Flintshire Sheet SJ1969/2069
1964 Ordnance Survey 1:2,500 map, Flintshire Sheet SJ1970/2070
1974 Geological Survey of Great Britain. 1:50,000

Not Accessed
Grosvenor (Halkyn) Maps in Flintshire Record Office, Hawarden (CROH)
1868 D/GR/1816 Plan & Section on the Panty Go vein, Deep Level, & Halkyn mines.
c.1875 D/GR/1819-23 Halkyn mines drainage plans.

8.4 Aerial Photographic Sources

Oblique
RCAHMW 935137 - 41

Vertical
Geonex 107 92 143 taken for Countryside Council for Wales at 1:10,000 on 6/7/1992.
Geonex 107 92 241-3 taken for Countryside Council for Wales at 1:10,000 on 6/7/1992.
Ordnance Survey 88/169/019 taken at 1:8,400 on 14/06/1988.
RAF 541/119/4071-3 taken at 1:10,000 on 30/07/1948.
RAF CPE/UK/1996/1204-6 taken at 1:10,000 in 1947.

APPENDIX 1: ARCHAEOLOGICAL SITES RECORDED WITHIN THE APPLICATION SITE

PRN	*Name*	*Type*	*Period*	*NGR*

43143 Bryn Siriol Reservoir Reservoir Modern? SJ1954870270
Square shaped reservoir measuring 17m x 17m internally x c.1.5m deep. Cut into ground level, with slight external bank, 2m wide x 0.3m high present on NE, SE, & SW sides. NW side defined by spoil resulting from excavation of reservoir. Area of spoil measures 15m NW/SE (max) x 37m NE/SW x 1.2m high. The spoil has been cut by a modern track leading to the N corner of the interior. Corrugated iron clad shed present in interior. At W corner of interior a gully approx 0.5m above the internal level heads in a NW direction towards the nearby shaft. The gully is cut into the SW end of the spoil and measures 1.2m wide x 0.3m deep x 10m long; it may have been disturbed to the NW or the water could have been carried by a launder. Presumably the reservoir acted as a store for water from, or intended for use in relation to, the shaft.

43144 Pant Quarry, shaft I Mine shaft Post-medieval SJ19517010
Shaft situated on a north-east facing slope. It has a diameter of 4.2m with spoil mounded around on the downslope side (Jones, N W, 2000)

44234 Hendrefigillt Mine, building II Building Post-medieval SJ19447021
Building, seen on unpublished CPAT aerial photo plot. (Holywell Common and Halkyn Mountain Historic Landscape Characterization, project database, 2000). No trace of this can be detected on the ground, although there is a patch of rough vegetation at the right location with a few lumps of limestone on it.

76245 Halkyn Mountain mine shaft Mine shaft Post-medieval SJ1958870407
Uncapped mine shaft (Campbell, S D G & Hains, B A, 1988). (Holywell Common and Halkyn Mountain Historic Landscape Characterization, project database, 2000). All surface traces have now gone.

76246 Halkyn Mountain mine shaft Mine shaft Post-medieval SJ1956570384
Uncapped mine shaft (Campbell, S D G & Hains, B A, 1988). (Holywell Common and Halkyn Mountain Historic Landscape Characterization, project database, 2000). All surface traces have now gone.

76247 Halkyn Mountain mine shaft Mine shaft Post-medieval SJ1956270400
Uncapped mine shaft (Campbell, S D G & Hains, B A, 1988). (Holywell Common and Halkyn Mountain Historic Landscape Characterization, project database, 2000). All surface traces have now gone.

76248 Halkyn Mountain mine shaft Mine shaft Post-medieval SJ1955270407
Uncapped mine shaft (Campbell, S D G & Hains, B A, 1988). (Holywell Common and Halkyn Mountain Historic Landscape Characterization, project database, 2000). All surface traces have now gone.

76250 Bryn Siriol Shaft V Mine shaft Post-medieval ? SJ1935270286

Possible shaft present in a large. generally flattened, mound of spoil, measuring 30m E/W x 30m N/S x 2m high (max). Slight depression towards west part of mound may be the shaft. Shaft may form an alignment with other shafts in the area. Depicted on first edition (1875) and third edition (1912) Ordnance Survey maps.

81788 Bryn Siriol Building 20th century SJ1949370334
Building showing on modern Ordnance Survey maps. Bryn Siriol is a now deserted, 20th-century brick-built bungalow with associated structures, on the site of an earlier, 19th-century sheepfold.

81789 Bryn Siriol Shaft I Mine shaft Post medieval SJ1945870315
Shaft, now collapsed and partially filled with household and agricultural waste, located to S of Bryn Siriol house. Shaft collapse zone measures c.10m diameter and is located between two large spoil tips. A wall to the N of the shaft extends for approx 16m. From the W spoil mound a line of 4 hollow iron rods extends towards the wall with two rods in-situ in the wall. Several iron rails lying loose. Local resident (related to a previous owner of Bryn Siriol) commented that the W spoil mound contained a gypsy caravan (apparently containing old motorbikes!) which had been buried to provide an air raid shelter during World War II. Depicted on third edition (1912) Ordnance Survey map.

81790 Bryn Siriol Sheepfold Sheepfold Post medieval SJ1945670321
Site of sheepfold depicted on the third edition (1912) Ordnance Survey 1:2,500 map. Visible remains composed of drystone wall revetted into the adjacent spoil mound of a shaft. Wall measures 16m long (E/W) x c1m wide x c.1.3m high. W end of wall curves to N where it is faced on the W side. The wall defines the Bryn Siriol boundary, consequently the majority of the site lies outside the assessment area.

81791 Bryn Siriol Shaft II Mine shaft Post-medieval SJ1948770327
Slightly irregular sub-circular mound 10m in diameter x 0.4m high with approximately central hollow. Situated to SE of fence around Bryn Siriol. Probably represents a shaft with surrounding spoil mound.

81792 Bryn Siriol Shaft III Mine shaft Post-medieval SJ1958770320
Former shaft bisected by fencing located to E of Bryn Siriol. Section within assessment area backfilled. Part of an area of shafts and spoil mounds located immediately outside the assessment area. Overall diameter is 11m, central collapse area is 7m in diameter x c.1m deep.

81793 Bryn Siriol Shaft IV Mine shaft Post-medieval SJ1942270304
Circular hollow 3m diameter x 0.5m deep with low, crescent shaped, spoil mound partially surrounding to N. Overall diameter is 8m. Few stones present in spoil mound.

81794 Bryn Siriol Shaft VI Mine shaft Post-medieval SJ1935770252
Central of a curving line of perhaps 3 shafts situated to S of possible shaft and spoil mound. This area of shafts has been backfilled and levelled fairly recently. Sketch plotted from 1993 RCAHMW aerial photograph (935137-41).

81795 Bryn Siriol Shaft VII Mine shaft Post-medieval SJ1935470241
Southernmost of a curving line of perhaps 3 shafts situated to S of another possible shaft and spoil mound. This area of shafts has been backfilled and levelled fairly recently. Sketch plotted from 1993 RCAHMW aerial photograph (935137-41).

81796 Bryn Siriol Shaft VIII Mine shaft Post-medieval SJ1935970265
Northernmost of a curving line of perhaps 3 shafts situated to S of possible shaft and spoil mound. This area of shafts has been backfilled and levelled fairly recently. Sketch plotted from 1993 RCAHMW aerial photograph (935137-41).

81797 Bryn Siriol Shaft IX Mine shaft Post-medieval SJ1940370239
Former shaft, now apparently backfilled, visible on 1993 RCAHMW aerial photograph (935137-41). Not visible on the ground.

81798 Bryn Siriol Shaft X Mine shaft Post-medieval SJ1939370234
Former shaft, now apparently backfilled, visible on 1993 RCAHMW aerial photograph (935137-41). Not visible on the ground.

81799 Bryn Siriol Shaft XIII Mine shaft Post-medieval SJ1939170315
Former shaft, now apparently backfilled, visible on 1993 RCAHMW aerial photograph (935137-41). Not visible on the ground.

82643 Bryn Siriol Shaft XIV Mine shaft Post-medieval SJ1943470337
Former shaft, now apparently backfilled, visible on 1993 RCAHMW aerial photograph (935137-41). Not visible on the ground.

82644 Pant Quarry Shaft I Mine shaft Post-medieval SJ1951970097
North-easternmost of two adjacent shafts. Consists of rubble-choked hollow 2.5m in diameter with crescent shaped spoil mound partially surrounding on NE side. Overall the spoil mound measures 8m in diameter x 0.4m high.

82645 Pant Quarry Shaft II Mine shaft Post-medieval SJ1951770091
South-westernmost of two adjacent shafts. Consists of boulder-filled hollow 4m in diameter with surrounding circular spoil mound measuring 10m in diameter x 1.5m high.

82646 Pant Quarry Shaft III Mine shaft ? Post-medieval SJ1948970091
Shallow depression, 4m in diameter, probably indicative of a backfilled shaft.

82647 Pant Quarry Shaft IV Mine shaft Post-medieval J1944170116
Northernmost of group of adjacent shafts. Consists of hollow 5m in diameter with surrounding spoil mound 10m in diameter.

82648 Pant Quarry Shaft V Mine shaft ? Post-medieval SJ1944570119
North-easternmost of group of shafts. Consists of hollow with crescent shaped mound of spoil on E side. Possibly 10m in diameter, overall.

82649 Pant Quarry Shaft VI Mine shaft Post-medieval SJ1944270110
Westernmost of group of four adjacent shafts. Consists of hollow, 3m in diameter, apparently cut into rock, with crescent shaped mound of spoil on N side 8m in diameter, overall. Small tree growing in shaft which is choked with boulders.

82650 Pant Quarry Shaft VII Mine shaft Post-medieval SJ1945670112
Easternmost of a group of adjacent shafts. Consists of a hollow, 4m in diameter x 0.7m deep, surrounded by a ring of spoil 6m in diameter, overall.

82651 Pant Quarry Shaft VIII Mine shaft Post-medieval SJ1944270152
Easternmost of group of four adjacent shafts. Consists of hollow with crescent shaped mound of spoil surrounding on NE side. 5m in diameter x 1m deep.

82652 Pant Quarry Shaft IX Mine shaft Post-medieval SJ1944070147
Southernmost of group of four adjacent shafts. Consists of circular hollow 3m in diameter x 0.3m deep.

82653 Pant Quarry Shaft X Mine shaft Post-medieval SJ1943670152
Westernmost of group of four adjacent shafts. Consists of hollow with crescent shaped mound of spoil surrounding on N side. 3m in diameter x 0.7m deep.

82654 Pant Quarry Shaft XI Mine shaft Post-medieval SJ1943270165
Northernmost of group of four adjacent shafts. Consists of hollow 4m in diameter x 0.3m deep.

82655 Pant Quarry Ridge and Furrow Ridge and furrow Medieval ? SJ1940070140
Area of ridge and furrow cultivation measuring 60m NW/SE x 70m, overall. Ridges aligned NW/SE and measure 3.5m to 6m wide x 0.3m high max. Appears to terminate at a low limestone scarp on its E side.

82656 Bryn Siriol Find Find Medieval SJ1947570340
Silver coin apparently found in vicinity of Bryn Siriol by relative of occupier. Said to have been examined by a specialist who described it as being minted in Canterbury during the 12th century.

82657 Halkyn Mountain structure Structure Post-medieval SJ1957970330
Foundations, on two sides, fashioned from the natural rock suggest a small building or structure, about 4m square. Levelled interior. Traces of quarrying in the vicinity?

APPENDIX 2

GLOSSARY OF TERMS

ADIT - Level driven into the hillside to provide access or drainage to a vein.

CROSS-COURSE - Major fault at right angles to the general trend of veins.

DRIVING - Act of advancing a tunnel.

FAULT - Displaced break in the earth's surface, which may or may not contain minerals.

LEAT - Artificial watercourse.

LEVEL - Horizontal entrance/passage in a mine.

LODE/ VEIN - Mineralised faults.

ORE - Mineralised rock.

PORTAL - Surface entrance to adit or level.

RAKE – Vertical fault in the rock filled with lead ore. Term interchangeable with *Lode*

SETT - Area leased by a mining company.

SHAFT - Vertical or near vertical passage in a mine, often driven from the surface.

SPOIL - Waste material from mining or dressing of ores.

WHIM CIRCLE - Circular feature defining the site of a horse-powered windlass for winding ore from the shafts.