

Threat-Related Assessment of Twentieth Century Military Sites:

FIRST WORLD WAR - *Industry and Manufacturing*

Interim Report Year 2



Llanelly National Shell Factory PRN 107898 (Llanelli Reference Library)

Prepared by Dyfed Archaeological Trust
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FIRST WORLD WAR – Industry and Manufacturing
Interim Report Year 2

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SUMMARY

Part 1 of this report investigating the archaeological legacy of the First World War on the counties of Pembrokeshire, Carmarthenshire and Ceredigion, is specifically focusing on the theme of Manufacturing and Industry which falls within the broader theme of 'Research Development and Manufacturing' in the research framework set out in Modern Military Matters. This builds on the work of the previous scoping reports undertaken by the Dyfed Archaeological Trust.

Part 2 of this report represents the results of fieldwork carried out by members of the local community with Dyfed Archaeological Trust on the site of the Pembrey Munitions factories. The site of Pembrey Munitions Factory is one of the largest sites relating to the First World War in the Dyfed region but little was known about the extent or survival of First World War remains. Situated within one of Carmarthenshire's and south-west Wales' prime visitor destinations, Pembrey Country Park provides a tremendous opportunity for the public to engage with archaeology, and to raise awareness of the history of the site with visitors from near and far.

The site had three phases of production, initially in the 19th century dynamite for industrial purposes was produced, and then, with the outbreak of the First World War, high explosives and propellant for shells were manufactured and used by the Army and the Admiralty. There was also a shell-filling factory on the site. Finally in 1938 when war was looming again over Europe a new factory was constructed, first to manufacture TNT but then also to decommission armaments and produce agricultural fertilizer, which continued until 1964. Pembrey Country Park was finally opened in 1980 and the extent of the park follows the boundary of the last factory. Work by local volunteers and members of the Trust have recorded many sites. This survey has enabled a much better understanding of the site, enhancing existing records and creating new ones. The survey has thus discovered that many features survive from the First World War factory, mostly as earthworks rather than buildings, but nevertheless a significant and poignant reminder of the dangerous work being undertaken, mostly by women, in Carmarthenshire during the Great War.

*Part 1 and Part 2 of this assessment have resulted in **one hundred and one** Historic Environment Records which have been updated or created in the Historic Environment Record. **Twenty seven** were existing records and **seventy-four** are new records.*

PART 1 –INDUSTRY AND MANUFACTURING

INTRODUCTION

This assessment forms part of an on-going project to assess the archaeological legacy from the First World War being carried out across Wales by all the Welsh Archaeological Trusts and funded by Cadw.

Over the centenary years different themes, as set out in the research agenda *Modern Military Matters* (Schofield 2004) are being addressed. These are:

- The Militarised Landscape
- Research, Development and Manufacturing
- Infrastructure and Support
- Operations
- Commemorations

In 2014-15 DAT carried out an assessment based on the theme of the Militarised Landscape, (DAT Report No 2015/15). This assessment addresses Industry and Manufacturing which falls within the broader theme of Research, Development and Manufacturing.

PROJECT AIMS AND OBJECTIVES

The overall **aims** of the centenary projects are:

- to record sites relating to the First World War on the Dyfed HER,
- to make recommendations for statutory protection for sites relating to the First World War,
- to engage local communities in recording sites relating to the First World War.

The specific **objectives** for the project in 2015-6 were the investigation of the key theme of Industry and Manufacturing and to focus on the munitions production at Pembrey. These tasks as far as possible were carried out in conjunction with community and local interest groups. Whilst it was hoped that further work could also have been carried out in the Milford Haven area in preparation for the forthcoming research themes, the extent and complexity of the archaeological remains at Pembrey precluded this, and efforts were focussed on attempting to record the extent of the Munitions works.

METHODOLOGY

Building on the research already carried out in the scoping reports the following methodology was adopted:

Desk-based assessment:

1. The National Archives was visited to assess primary source material for sites across the region and specifically for Pembrey Munitions Factory and the National Filling Factory.
2. Visits to the local archives in Pembrokeshire and Ceredigion (Carmarthenshire Archives were temporarily closed).
3. Local newspapers now available online provided valuable information and context to sites.
4. Online resources have been searched for sources of information.
5. Secondary sources, including books and articles.
6. A number of individuals (see acknowledgements) have been instrumental in providing sources and information on sites in the region.
7. Initially sites have been created as point data, and where possible polygon data on GIS (MapInfo). The point data has then been converted into an HER database to be worked on and updated before validation in the HER.

8. GIS polygon data has been created for use within the HER and to inform future heritage management advice.
9. Sites have been updated within the HER and are accessible on the website Archwilio www.archwilio.org.uk

References to sources have been listed within the bibliographies for individual site records within the HER.

Carmarthenshire Archives were closed for the duration of the project; therefore unfortunately it was not possible to consult local Carmarthenshire records.

The report has been divided into two parts; part 1 is an overview, based on the desk-based assessment, of the regional response to the First World War with reference to Industry and Manufacturing and highlights specific sites which have been identified. These sites are referenced by a PRN which is then recorded in the gazetteer to the rear of the report. Part 2 provides a narrative history of the munitions factories at Pembrey. Individual records of site features are referenced by a PRN which is recorded in the gazetteer to the rear of the report.

BACKGROUND

The industrial response to the First World War takes three forms, as identified by Crawford in the assessment of Industry and Manufacturing in the south-east of Wales (Crawford 2015). Initially pre-existing industries scaled up production for the war effort, which was universally carried out at the outset of the war when it was commonly believed it would be quick resolution to the conflict. As the conflict progressed many pre-existing industries were adapted for war work and there are a number of examples of this in Dyfed. The third response is that of new industrial ventures which were established in direct response to the war and to carry out war work.

Clearly the region as a whole responded to the war effort. Carmarthenshire, Pembrokeshire and Ceredigion were not, with the exception of the south-east of Carmarthenshire, primarily industrial counties which rely on heavy industry. Agriculture and forestry cover much of the region, and both fulfilled a crucial role, the first in supplying and feeding a nation whose imports were threatened by U-boat attacks and second the provision of timber both for military needs, but also the increased demand from other industries supplying the war effort. Perhaps what has been most problematic is identifying the *archaeological* imprint of any such response which has a landscape scale impact, though undoubtedly this would form a valuable area of study. This report has focused on those manufacturing industries where there is evidence of a significant role during the war which has not been previously portrayed in the archaeological record. This includes industries carrying out government contracts or industries which were nationalised and under government control, such as munitions related work.

RESULTS

The distribution of sites across Dyfed relating to industry in the First World War reflects the industrial heartland of south-east Carmarthenshire, with a scattering of sites in other areas as shown in Fig. 1 and Table 1.

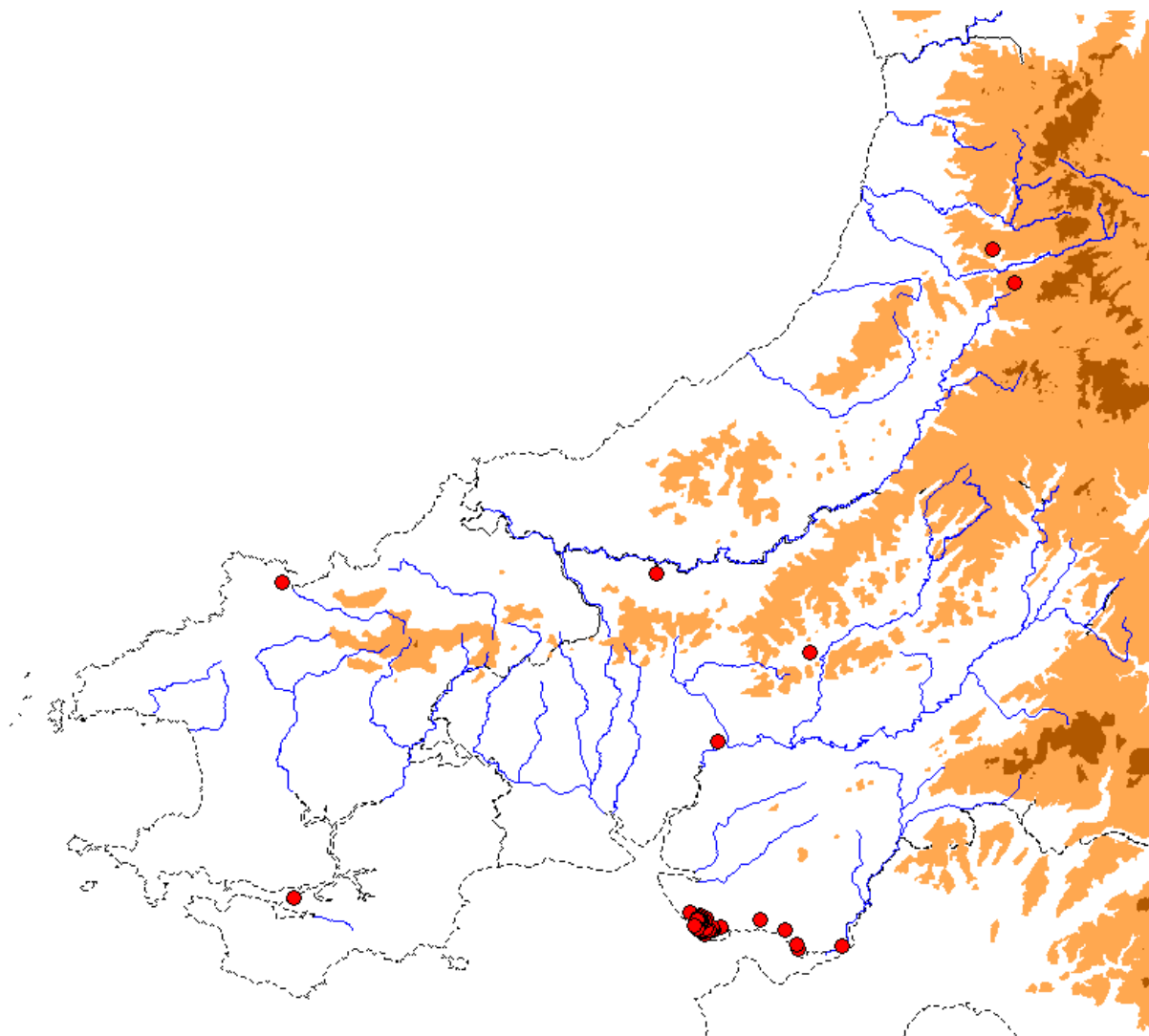


Figure 1: Distribution of industrial sites in the region of Dyfed

PRN	Site Name	Type	Community	NGR
7224	ROYAL DOCKYARD	DOCKYARD	PEMBROKE	SM960037
8660	NEW POOL COLLIERY	COAL MINE	LLANELLI RURAL	SN46830126
8670	PEMBREY EXPLOSIVES WORKS TRAMWAY	Tramway	Cefn Sidan	SN42490043
9039	PEMBREY EXPLOSIVES WORKS	Explosives Works;EXPLOSIVES FACTORY	Cefn Sidan	SN41200010
9151	FRONGOCH LEAD MINE	LEAD MINE	Pontarfynach	SN72157439
16246	ROYAL ORDNANCE FACTORY PEMBREY	Factory;MUNITIONS FACTORY	Cefn Sidan	SN41000040
22535	BRECHFA;Y GWAITH	Chemical Works	Llanfihangel Rhos-y-Corn	SN52333040
22585	CAMBRIAN MILLS	Woollen Mill	Llangeler	SN35513909
25931	GLOGFACH;GLOGFAWR(ERROR);LISBURNE ;PEN GLOG	Lead Mine	Llangeler	SN35513909
30708	SOUTH WALES IRON AND TINPLATE WORKS;SOUTH WALES STEEL AND	Tinplate Works	Llanelli	SS50829858

	TINPLATE WORKS			
31343	HMF PEMBREY	Railway Siding	Cefn Sidan	SN40930139
31362	HMF PEMBREY	Tramway;RAILWAY	Cefn Sidan	SN40750120
31371	ROF PEMBREY	Observation Post	Cefn Sidan	SN40170062
31373	HMF PEMBREY	Tramway	Cefn Sidan	SN40000070
31374	HMF PEMBREY	Building Platform	Cefn Sidan	SN39930066
31375	ROF PEMBREY	Observation Post	Cefn Sidan	SN39700062
31377	HMF PEMBREY	Building	Cefn Sidan	SN40460098
31378	HMF PEMBREY	Unknown	Cefn Sidan	SN40540102
31397	HMF PEMBREY	Bunker;EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40160126
31400	HMF PEMBREY	Unknown;EXPLOSIV ES MANUFACTURING SITE	Cefn Sidan	SN40390120
31401	HMF PEMBREY	Building;EXPLOSIVE S MANUFACTURING SITE	Cefn Sidan	SN40340122
31402	HMF PEMBREY	Pit	Cefn Sidan	SN40300120
31403	HMF PEMBREY	Structure;EXPLOSIV ES MANUFACTURING SITE	Cefn Sidan	SN40320123
31622	BYNEA STEEL WORKS	Works;STEEL WORKS	Llanelli Rural	SS55859841
61238	WEAVING SHED AT MUSEUM OF WELSH WOOLLEN INDUSTRY	Weaving Shed;WEAVERS WORKSHOP	Llangeler	SN3547039087
103997	LLANELLY STEEL WORKS	Steel Works	Llanelli	SN3547039087
106519	HM FACTORY PEMBREY; NOBELS EXPLOSIVES FACTORY	Explosives Factory;MUNITIONS FACTORY	Cefn Sidan	SN40500050
107840	Magazine M1 ROF PEMBREY	MAGAZINE	Cefn Sidan	SS4098899818
107841	Magazine M2 ROF PEMBREY	MAGAZINE		SS4082999784
107842	Magazine M3 ROF PEMBREY	MAGAZINE		SS4089299931
107843	Magazine M4 ROF PEMBREY	MAGAZINE	Cefn Sidan	SS4070599932
107844	Magazine M5 ROF PEMBREY	MAGAZINE	Cefn Sidan	SN4081600021
107845	Magazine M6 ROF PEMBREY	MAGAZINE	Cefn Sidan	SN4061700025
107846	Magazine M7 ROF PEMBREY	MAGAZINE	Cefn Sidan	SN4073500105
107847	Magazine M8 ROF PEMBREY	MAGAZINE	Cefn Sidan	SN4053500117
107848	Magazine M9 ROF PEMBREY	MAGAZINE	Cefn Sidan	SN4065900204
107849	Magazine M10 ROF PEMBREY	MAGAZINE	Cefn Sidan	SS4057399900
107850	HMF PEMBREY Nitrator Separator House	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN4070500485
107851	HMF Pembrey Dry Gun cotton magazine	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40530067
107852	HMF Pembrey Dry Gun cotton magazine	EXPLOSIVES		SN40570062

		MANUFACTURING SITE		
107853	HMF Pembrey Cordite Paste Mixing house	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40600069
107854	HMF Pembrey Cordite Paste Mixing house	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40640064
107855	HMF Pembrey Cordite Paste Mixing house	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40680059
107856	HMF Pembrey Cordite Paste Mixing house	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40660070
107857	HMF Pembrey Cordite Paste Mixing house	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40700065
107858	HMF Pembrey Cordite Paste Expense magazine	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40690077
107859	HMF Pembrey Cordite Paste Expense magazine	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40730072
107860	HMF Pembrey Cordite Paste Expense magazine	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40730067
107861	HMF Pembrey Cordite Paste Expense magazine	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40820064
107862	HMF Pembrey Cordite Paste Expense Magazine	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40740081
107863	HMF Pembrey Cordite Paste Expense Magazine	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40780076
107864	HMF PEMBREY Cordite Paste Packing House	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN4026801045
107865	HMF PEMBREY Cordite Paste Packing House	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN4022801092
107866	HMF PEMBREY Cordite Paste Packing House	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN4018701142
107867	HMF PEMBREY Cordite Paste Mixing House	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN4010301151
107868	HMF PEMBREY Cordite Paste Mixing House	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN4014401103
107869	HMF PEMBREY Cordite Paste Mixing House	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN4018501056
107870	HMF PEMBREY Cordite Paste Mixing House	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN4022801009
107871	ROF PEMBREY	LOOKOUT		SN4069300801
107872	HMF PEMBREY	STRUCTURE	Cefn Sidan	SN4073600711

107873	HMF PEMBREY	PIT	Cefn Sidan	SN4028001444
107874	HMF PEMBREY	PIT	Cefn Sidan	SN4028801452
107875	HMF PEMBREY	RAILWAY PLATFORM	Cefn Sidan	SN4029801464
107876	HMF PEMBREY	RAILWAY PLATFORM	Cefn Sidan	SN4015401212
107877	HMF PEMBREY	RAILWAY	Cefn Sidan	SN4015701141
107878	ROF PEMBREY	LOOKOUT	Cefn Sidan	SN3991100280
107879	ROF PEMBREY	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN4060901094
107880	ROF PEMBREY	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN4066801053
107881	ROF PEMBREY	BUILDING	Cefn Sidan	SN41670015
107882	ROF PEMBREY	ENGINEERING WORKSHOP	Cefn Sidan	SN40500061
107883	ROF PEMBREY Main Gate	GATEHOUSE	Cefn Sidan	SN41530046
107884	ROF PEMBREY	PUMP HOUSE	Cefn Sidan	SN41520012
107892	HMF PEMBREY Factory Magazine	MAGAZINE		SN4056000003
107893	HMF PEMBREY Factory Magazine	MAGAZINE	Cefn Sidan	SN4050500066
107894		STRUCTURE	Cefn Sidan	SN4065600767
107895	ROF PEMBREY	BUILDING	Cefn Sidan	SN4016800249
107898	BURRY EXTENSION WORKS	MUNITIONS FACTORY	Cefn Sidan	SS50919810
109248	HMF PEMBREY Gun Cotton Weighing House	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN3993501366
109249	HMF PEMBREY Gun Cotton Expense Magazine	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN39960143
109250	HMF PEMBREY Gun Cotton Drying stove	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40420052
109251	LLANELLY RECTIFICATION FACTORY	MUNITIONS FACTORY	Llanelli	SS50999816
109252	NATIONAL FILLING FACTORY NO 18 PEMBREY	MUNITIONS FACTORY	Cefn Sidan	SS40769977
109253		CHEMICAL WORKS	Carmarthen	SN422207
109254	ROF PEMBREY	AIR RAID SHELTER	Cefn Sidan	SN4078800760
109255	HMF Pembrey Wash Water Settling House	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN4005801257
109256	HMF Pembrey N/G Washing House	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN4021201260
109257	HMF Pembrey Nitrator Separator	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40160130
109258	HMF Pembrey Guncotton Weighing House	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN39990124
109259	HMF Pembrey Guncotton Expense	EXPLOSIVES	Cefn Sidan	SN39930129

	Magazine	MANUFACTURING SITE		
109289	HMF Pembrey Gun cotton Drying Stoves	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40120148
109290	HMF Pembrey Gun cotton Drying Stoves	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40090153
109291	HMF Pembrey Gun cotton Drying Stoves	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40160152
109292	HMF Pembrey Gun cotton Drying Stoves	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40140157
109293	HMF Pembrey Gun cotton Drying Stoves	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40190161
109294	HMF Pembrey Gun cotton Drying Stoves	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40210156
109295	HMF Pembrey Gun cotton Drying Stoves	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40250159
109296	HMF Pembrey Gun cotton Drying Stoves	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40230165
109297	HMF Pembrey Gun cotton Drying Stoves	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40300163
109298	HMF Pembrey Gun cotton Drying Stoves	EXPLOSIVES MANUFACTURING SITE	Cefn Sidan	SN40280169
109299	HMF Pembrey	BUILDING	Cefn Sidan	SN39180216
109300	GWR Marine Factory	FACTORY	Fishguard	SM947381

Table 1: A table showing the HER sites enhanced and created for the assessment, those sites associated the Munitions works at Pembrey are shaded.

Munitions Manufacturing

Munitions manufacturing in the Dyfed region really took off after the shell crisis of 1915, when the lack of British success on the battlefield was perceived to be due to a shortage of high explosive artillery shells. This political scandal resulted in a national munitions policy which was proposed by David Lloyd George who then as the Minister of Munitions governed a Ministry dedicated to organising the production of munitions. Following the creation of the Ministry new munitions factories were established, and in Llanelli a local Munitions Committee was founded (Nicholson 1919 p78).

In the region there were three National Factories, HMF Pembrey (PRN 106519), the National Filling Factory (PRN 109252) and the Llanelli National Shell and Rectification Factory (PRNs 107898, 109251). The factory at Pembrey made high explosives and propellents and had a Filling Factory adjacent. The factories in Llanelli were concerned with making shell cases and may have supplied Pembrey but also exported shells elsewhere. Many other factories in the area manufactured other steel or metal components essential for munitions but were not governed directly by the Ministry of Munitions.

Iron and Steel Works

The region's industrial heart lay in the Llanelli area. At the end of the 19th century it was dependant on the tinplate industry and made steel almost solely to supply this process (Craig *et al* 2000, p143). However during the First World War steel was a more essential material than tinplate and the region's steel industry increased production to meet the military demands of the war. With the advent of the Ministry of Munitions in 1915, and David Lloyd George in charge, the region geared up to increase and diversify its manufacturing. As a result a number of regional committees were established of which Llanelli formed one based on a number of local manufacturers. The Western group of works, together with other firms located on the east side on the River Loughor, comprised the following Llanelli based companies:

- Llanelli Steel Works (PRN 103997)
- Bynea Steel Works (PRN 31622)
- Richard Thomas & Co., Ltd (South Wales Steel Works PRN 30708)

The last two of these firms saw modernisations, enlargements and extensions as a result of the increase in production. Several firms started to manufacture steel billets as opposed to steel bars to supply UK mills which had previously been supplied by Germany (Nicholson 1919, p79). In 1916 the Western group of firms formed a committee in order to supply the French Government with 4000 tons of shell steel of which the Llanelli Steel Works, the Bynea Steel Works the South Wales Steel Works played a significant part. Local newspapers, in commending Llanelli's contribution to the war effort held that Llanelli steel played a large part in the defence of Verdun (Llanelli Star 19/7/1919). New factories were established to make shells, and Richard Thomas and Co. placed their newly built Burry Extension works (PRN 107898) at the disposal of the committee and from there 6 inch shells were manufactured. In addition to their usual trade of tinplate the Glanmore foundry was also providing shell parts (Nicholson 1919 p96).

Coal

Prior to the First World War coal mining had seen a steady decline in production, but with the outbreak of war production and employment increased to meet demand. This increase however, has been hard to pinpoint in terms of an archaeological legacy. Commonly, idle collieries reopened such as New Pool colliery at Pwll (PRN 8660) and work restarted at Crown colliery at Pwll. In the Llanelli area the increased production and employment figures continued to rise for a further 3 years after the cessation of hostilities with a peak figure of 1326 employed in 1921, before rapidly declining (Craig *et al*. 2000 p82). The archaeological footprint of this war production has been difficult to quantify in this assessment, and no sites have been directly identified as having a legacy from the First World War. The impact of the 'war effort' should however be borne in mind whenever further work is carried out on specific sites.

Docks

The Royal Dockyard Pembroke Dock (PRN 7224) was in decline at the turn of the 20th century, with the last warship built at the yard, HMS Defence, launched in 1907. However during the First World War it nevertheless carried out important war work including building light cruisers, submarines and fleet oilers. Roosevelt visited the Dockyard in July 1918 and noted that the number employed there had quadrupled to 4000 since the start of the war and of those workers 500 were women (Phillips 1993, p170).

Five submarines were built at the yard including two J-class submarines which were designed by the Royal Navy in response to the German submarines capable of a surface speed of 18 knots. They were the only triple screwed submarines ever built by the British, and with a top speed of 19 knots they were the fastest in the world at the time of construction. Also built in the Royal Dockyard was one L-class submarine, L10, and two American designed H-class submarines which were so successful they were still in use at the start of the Second World War (Phillips 2014, p311).

Mining and Quarrying

Lead mining had seen a decline for the preceding 50 years, but the war necessitated the exploitation of zinc ore, which had previously been a waste material in the more profitable quest for lead. Waste tips were worked over to recover the zinc ore and in 1916 5157 tons of dressed lead and zinc ores were recovered from Welsh mines which included amongst others, the Cwmystwyth and Lisburne group in Ceredigion (Nicholson 1919 p115). Both Glogfawr (PRN 25931) and Gwaithgoch in the Ystwyth valley were worked. The dumps at Frongoch (PRN 9151) were also exploited and this venture included the construction of an aerial ropeway from Frongoch to Gwaithgoch Mill and a long timber bridge over the River Ystwyth for access (Bick 1986, p22-24).

During the First World War stone quarries at Capel Quarry, and Gwscwm Quarry near Pembrey were briefly reopened and intensively worked by Scott, Walter and Middleton Ltd, contractors for the construction of Nobel's Explosives Works (Craig *et al*, p340).

Chemical Industry

An essential part of the production of propellant was acetone, a solvent used in the manufacture of cordite. This commodity could be produced as part of the distillation of timber, but prior to the First World War Britain had relied on imports from Canada and the US. Until an alternative way to produce it had been discovered (which was done so by the Russian born chemist Chaim Weizmann in 1916) there is evidence that timber chemical works were producing 'acetate of lime' (a starter for acetone) in Carmarthenshire. A wood chemical works (PRN 22535) in Brechfa, in the heart of Carmarthenshire's forests, was operating using local timber producing charcoal and other products from 1844 to 1923. It is recorded in local papers that the Brechfa plant was undertaking contracts for war work and that the company in operation at the time was the Anglo-French Nickel Company. A government sponsored chemical works was also in construction at Carmarthen, however this was not completed, (PRN 109253).

Woollen Industry

The textile industry of Wales specialized in tweeds and flannel, which received a great boost during the First World War as a result of large Government contracts for blanket and uniform cloth. Indeed it was intended that the new Welsh Army Corps would be clothed in a distinctive Welsh cloth, 'Brethyn llwyd'. A number of factories were expanded and re-equipped to accommodate this production. At the end of the war contracts came to an end, the market was flooded with surplus cloth and the industry went into decline. This course of fortune is reflected at the Cambrian Mills at Drefach Felindre (PRN 22585), with a phase of expansion effectively doubling the capacity of the operation which led to a new weaving shed being built (PRN 61238) and a re-ordering of machinery. In addition it has been suggested that the fire in 1919 when the demand for cloth had slumped was quite providential (Ludlow *et al* 2001). Whilst numbers of mills are recorded as having Government contracts to produce cloth for the army, the Cambrian Mills at present is the only site where this appears to have left an archaeological legacy, though clearly this episode of increased productivity ought to be considered in further investigations of specific mills.

Other

The Great Western Railway company fleet of steamships consisting of the turbine vessels of St. David, St Patrick and St. Andrew, were employed on the Fishguard-Rosslare service until they were all commandeered by the Admiralty and converted into hospital ships. The fitting of the ships for their new duties was carried out by the company's Marine Factory staff at Fishguard (PRN 109300). This included provisioning 200 cot cases and the construction of lifts in which the patients in their cots could be transferred to or from the main and lower decks of the ships (Pratt 1921, p934).

After the armistice they were converted into troop ships and used in connection with the demobilization for the British Armies in France.

DISCUSSION

In terms of a starting point for sources the recently published Council for British Archaeology book, *The Homefront in Britain 1914-18, an Archaeological Handbook* (2015) provides a good background to the industries of the period, though few specific references are relevant to this area. One of the key sources to provide an overview of the industrial responses to the First World War, is *Wales, its part in the war* (Nicholson 1919). Whilst this could be argued to be a piece of post war propaganda it undoubtedly highlights some of the key players, the industrialists of Wales who entered into the war effort with great commitment and possibly an eye for opportunity. The official history of the Ministry of Munitions, recently republished in 12 volumes is the most extensive and detailed account and provides both the broad view and specific narrative histories of sites such as the National Factories (PRNs 109251, 106519, 107898, 109252). The comprehensive *Industrial and Maritime History of Llanelli and Burry Port 1750-2000* has been indispensable in looking at the wide range of industries which lie in the industrial heartland of Carmarthenshire. Likewise the Pembrokeshire County History covering Modern Pembrokeshire gives an overview of the industries, particularly of the dockyard over the period. Other secondary sources have focused on specific industries or particular sites, and include Geraint Jenkins on the Welsh Woollen Industry, David Bick on Frongoch Lead Mine and Lawrie Phillips on Pembroke Dockyard.

As previously discussed whilst the industry and manufacturing of the region have been highlighted in this first part of the report it is likely other industrial aspects of the First World War will come to light, particularly those of pre-existing industries which scaled up production and those which adapted to war work. In addition the landscape scale impact of agriculture and forestry in the region still has to be fully considered. Therefore the archaeological footprint of this episode should always be considered when opportunities arise to look into the histories of industry more closely. There is a danger that this period is still considered to be too recent to give the same level of archaeological scrutiny which has been afforded to the earlier 19th century industrial past. It is hoped that this project, of which this report forms part, will highlight the potential, and the significance, of the archaeology of the First World War.

PART 2 – PEMBREY MUNITIONS FACTORIES

INTRODUCTION

This second part of the report represents the results of fieldwork carried out by members of the local community with Dyfed Archaeological Trust on the site of the Pembrey Munitions factories. This site is one of the largest sites relating to the First World War in the Dyfed region but little was known about the extent or survival of the First World War remains. Situated within one of Carmarthenshire's and south-west Wales' prime visitor destinations, Pembrey Country Park provides a tremendous opportunity for the public to engage with archaeology and provide information to visitors from near and far.

AIMS

The aims of the study at Pembrey can be summarised;

- to undertake documentary research on the Pembrey Munitions factories specifically focussing on the First World War remains,
- to undertake field visits to assess survival, condition and vulnerability,
- to enhance existing HER records and create new HER records
- to engage local communities and others in recording First World War and associated sites,
- to identify sites that are of national importance and make scheduling recommendations,
- to produce a short project report to disseminate findings

The project ran concurrently with a Heritage Lottery Funded element from the grant scheme 'First World War, then and now', which in addition has funded a new self-guided leaflet to explain the archaeology of the site, a series of information pop-up panels, educational resources and enabled students from Glanymor Secondary School Burry Port to carry out course work for their GCSEs on the archaeology of the site.

METHODOLOGY

As part of the investigation of the site documentary research was undertaken at Carmarthen Archives in 2013 when the Archives were still open, the West Glamorgan Archives, Llanelli Library and Local Studies department, the National Archives at Kew and the Imperial War Museum. Other searches were conducted on the internet.

Fieldwork has been carried out over a number of months with sessions organised with local groups during the months of September and November 2015.

A map regression has taken place (Appendix A); key plans were located at the National Archives, principally the c.1917 Block Plan of Plant and the R.O.F. Pembrey Layout of Factory (SUPP10/72, BD25/83). These plans were geo-registered on MapInfo GIS which enabled areas of the site to be examined against the modern Ordnance Survey MasterMap (2011). LiDAR 2003 and 2006 data stripped of vegetation was also registered on GIS and areas of potential identified. A range of aerial photographs including vertical aerial photographs and oblique photographs have been assessed (Appendix B).

Areas of high archaeological potential were identified and prioritised for ground-truthing.

Five separate volunteer recording days were organised on the 2nd, 9th and 24th September and 14th and 21st November 2015. A volunteer group who usually works with Carmarthenshire County Council Park Manager, Simeon Jones, on biodiversity enhancement work and general park maintenance were invited to participate with the fieldwork. In November volunteer training days were advertised through DAT's Facebook page and newsletter. Thirteen people volunteered their time on fieldwork days and contributed a total of 125 hours working on the project in the field. In addition the 26th October 2015 was spent with Mencap volunteers and co-workers who work in the Park every week and they worked hard to clear vegetation from around some of the sites and make them more accessible.

Fieldwork consisted of volunteers working in small groups with DAT staff to record individual sites. Recording included taking digital photographs of features with a metre or two metre ranging pole,

and a customised recording sheet was developed for the project to prompt volunteers to record important features (Appendix C).

A further 35 hours of volunteer time has been spent in the office cataloguing photographs and documentary based work. See Appendix D for feedback from the fieldwork sessions with Mencap and other volunteers.



Figure 2: Vegetation clearance to improve accessibility to the earthworks was carried out by Mencap volunteers and co-workers.

BACKGROUND TO THE SITE

Centred on National Grid Reference SN40560068, the majority of the site is located within Pembrey Country Park, which is owned and managed by Carmarthenshire County Council. Part of the First World War factory lies within Pembrey Forest, which is managed by Natural Resources Wales.

There are a number of attributes to the site which make it a favourable location for a munitions factory. The peninsula is sparsely populated. It is part of a dune system known as Pembrey Burrows and Tywyn Burrows, behind which are extensive tidal flats and marshes partly reclaimed behind banks and sea walls (Kye and Blott 2014). Though sparsely populated, it is well connected, for the former Great Western Railway, and current Paddington to Fishguard mainline runs close to the site, and the small harbour at Pembrey, which was opened in 1819, lies only 2 kilometers away (Craig et al., 2002, p548). Its suitability for the establishment of a factory must also have been the supply of a workforce at hand, for as well as the local villages of Pembrey and Burry Port the major towns of Llanelli and Carmarthen lie within easy reach. The coastal strip appears to have been grazed as common land from the middle ages however the farmed inland areas were part of the Ashburnham estate in the 19th century.

Dynamite Factory

The earliest documented factory was built in the late 19th century, and was a short lived venture.

In 1881 newspapers reported that the Stowmarket Explosive Company applied for a license to manufacture explosives in a new factory at Pembrey on land leased from the Earl of Ashburnham, on an area of land of 150 acres (South Wales Daily News 25/11/1881) along with the lease of the old harbour and docks. At the time the new factory opened a new company; the Explosives Company, was formed and superseded Stowmarket Explosives. At this time the explosives manufactured, along with detonators, electric and other fuses, were intended for use in collieries and quarries rather than munitions.

The factory was in operation less than a year when on the 18th November 1882 a terrible explosion killed seven young people, aged between 13 and 24 years old. The newspaper accounts of this horrific event, which left the village in mourning, give some insight into the factory itself.

It is reported that the factory consisted of 80 small sheds, scattered over a large area with a small locomotive used to reach the manufacturing areas. The sides of the sheds were composed of thin boards and roofs made of felt and floors of sand. The sheds were flimsy in order to offer little resistance to an explosion but they were placed 70 yards apart with a high mound of sand in between. The company was licensed to store 144 pounds of dynamite (though it was alleged there were over 300 tons stored, in a Parliamentary question just the day before the explosion) which was kept in twelve magazines far removed from each other and almost buried underground.

The explosion appears to have also been a fatal blow to the Explosive Company and on the 22nd May 1885 it went into receivership to be succeeded by the South Wales Explosives Company. Subsequently it appears that the factory was no longer producing explosives but the site was used as warehousing and distribution, since further newspaper reports give an account of a fire in May 1893 in which three sheds were burnt to the ground but the magazines were unaffected.

No plans have been accessed to establish the layout of the factory but the Second Edition Ordnance Survey map published in 1908 shows the layout of the 'Old Dynamite Works' (Fig. 31) which although depicting it when it was no longer operational does give some detail to its layout and extent. An irregular boundary encloses the factory within which are a series of structures and isolated buildings (Fig. 30). These structures and buildings do not correspond to any of the later structures built for the 20th century factories and must have been cleared from the site in 1914. A horseshoe shaped bank is shown on the 2nd edition (Fig. 29), however it is unclear if this was an artificial construction or a dune formation, but it is possible that this was utilized in the placing of buildings. While this bank no longer exists there is a single large mound in the same location which may represent the clearance of the bank and the buildings which were built around it. The line of an old tramway (PRN 8670) is shown linking the factory across the dunes to Pembrey Harbour (PRN 5344).

First World War

The key works on the history of the site is *The Official History of the Ministry of Munitions* published in 1922 which document the establishment and output of the works at Pembrey. There are two factories at the site during the First World War, the Munitions Factory and the Filling Factory, the first making high explosives and propellants, and the second filling shells.

H.M. Factory, Pembrey

The HM Factory Pembrey is described as 760 acres and including 400 buildings, which produced both TNT tetryl, cordite and ballistite. Nobel's Explosive Company Ltd had already plans to build a factory to make industrial explosives, designed and managed by Sir Frederic Nathan who was works' manager at Ardeer (Cocroft 2006, p33). In October 1914 they agreed with the Secretary of State for War to erect and manage a factory to make TNT. The firm was also contracted by the Admiralty to manufacture propellant explosives. In 1915 these two agreements were combined under the newly established Ministry of Munitions. At the end of 1916 the plant became Government property, and Nobel's became the managers of the site on behalf of the Ministry.

Key dates are which are useful in the interpretation of the earthworks which survive;

- July 1915 TNT manufacture began,
- July 1915 Admiralty arranged with Nobel to erect additional plant for the manufacture of MD cordite paste from guncotton from outside sources,
- January 1916 – cordite paste production began,
- October 1915 - further extension brought in plant for ordnance and rifle cordite and ballistite, included sections for production of guncotton and nitro-glycerine
- March 1916 – ballistite, rifle and ordnance cordite in production.
- Tetryl plant in production by autumn 1915,

15,000 tons of TNT were produced during the war and 20,000 tons of propellant. The total number of workers in October 1918 was 4765 of which 58.6% were women (HMSO Pt II, Chapter II p69-70).

National Filling Factory, No. 18 Pembrey

As part of the contract of 1915 between the War Office and Nobel's Explosives Company a loading plant for the filling of shells, torpedoes and mines was to be built adjacent to the TNT factory and this was to be erected and equipped by the Explosives Loading Company. This factory was also taken into Government ownership on the 1st January 1917 and became the National Filling Factory No 18 Pembrey. The factory at its height consumed more than 200 tons of High Explosives every week, so much was used that the supply of purified TNT could not keep pace and a proportion of amatol was substituted for it.

Key dates for the plant are;

- 2nd July 1915 when filling began.
- May 1917 filling shells was discontinued, and the breaking down of defective ammunition and recovering components began.

The labour for the factory required a recruitment from further afield than the local area and special trains brought in workers from Swansea and Carmarthen. In March 1917, the factory employed 1050 workers, 70.5% being women (HMSO, Pt II Ch V p172-3).

Lando was the stop created on the GWR mainline for the factory at Pembrey, from which 14 trains a day carried a sum total of 4,057,000 workers during the period of the war, the greatest number in a day being 5,100. The cordite paste being manufactured at Pembrey was exported on specially designed carriages, dust-proof and steam-fitted to maintain an even temperature. Seven vehicles to a train took the cordite as far afield as Faversham and Chilworth in Surrey, via Reading and the Southeastern and Chatham Railway (Pratt 1921, p924-5).

The end of production at HM Pembrey

Work continued at No 18 Filling Factory disassembling munitions until the end of 1919 when many workers were laid off and presented with a certificate for their labour (West Glamorgan Archive Service, Acc no 4793 and Llanelli Library LC13440).

Sales of plant machinery took place through the early 1920s; Plant Machinery in July 1922, and Chemical Plant and Machinery in November 1922. In 1926 the final sale took place including the 771 acres freehold with buildings, cottages, steam, electric, and pumping plants, weigh-bridge, 13

and half miles of railway sidings, 21 and half miles of tramways, 100 circuit automatic telephone installations, water service with reservoir etc. At the sale, held in the Hotel Metropole in Swansea, the factory was sold in one lot for £30,000 to a local firm of breakers and scrap merchants, (South Wales Press 6/10/1926 and sale catalogue, Carmarthen Archive Service GB 0211 DB65).

Of the period between the First and Second World Wars little is known. However from 1935 the site became one of a chain of school camps for the children of the South Wales distressed areas (Hughes 2015-16, 13 and Hansard 16/5/1938).



Figure 3: The factory offices, used as Pembrey School camp between the wars (Dave Hughes).

Second World War: ROF 34, Pembrey

In 1938 a new factory was proposed at Pembrey and work on construction began that year, continuing into 1939. The work was tendered out in a number of contracts some of which survive at The National Archives (WO 26/17/A1, WORK 26/17B/1). Photographs of the construction show that many of the earlier manufacturing buildings were demolished (Fig. 18), although the administration buildings survived.

A history of the factory is summarised in Ian Hay's, *The Story of the Royal Ordnance Factories, 1939-1949*. The factory was government owned from the start and known as the Royal Ordnance Factory Pembrey. It was one of four factories producing TNT, the others being Irvine, Drigg and Sellafield. According to Hay, Pembrey was the largest supplier of TNT, tetryl and ammonium nitrate. The factory was 500 acres, smaller than the HM Factory Pembrey of the First World War, excluding an area of 270 acres to the northwest.

Production began in December 1939 and at its height the factory employed 3000 workers, which after the war reduced to 1300. Following the war the factory's production of ammonium nitrate, which during the war had been combined with TNT to make the explosive amatol, was then used to make agricultural fertiliser.

From 1944 the factory had also been breaking down defective ammunition which necessitated extracting the TNT which would then be burnt off on the 'burning ground', some of the by-product of this process, 'carbon black', was captured for use as printers' ink. Hay's description of the factory indicates that motor transport and buses were the primary means of workers travelling to and from the factory.

Post War

The Royal Ordnance Factory continued in operation breaking down surplus ammunition for many years after the Second World War ended, however the amount of work steadily declined until in the final two years it employed only 400 people. A departmental review between 1960 and 1962 concluded that the much reduced need for TNT would be relocated to another factory and the remaining activities at Pembrey would be dispersed. By December 1963 the ROF was closed and up for sale. Hopes for the factory to be bought and redeveloped by another business faded and finally a firm from Halifax, Wescol Construction Company, stripped the site and removed anything of value. Some parts of the factory were used as an industrial estate with small scale industrial units established in some of the vacant buildings. In 1969 – 70 a controversial bid to move the Shoeburyness experimental gunnery range to whole of the Pembrey peninsular led to a public inquiry with strong local objections (Ladd 1992, 83). Eventually the site was cleared and decontaminated and established as a country park opening to the public in 1981.

FIELDWORK RESULTS

Fieldwork was aimed at establishing the extent and survival of First World War remains. Prior to this survey the full extent of the archaeological potential was not fully understood and not recorded within the Historic Environment Record. Locals, and particularly the employees and former employees of the country park have been extremely helpful in highlighting areas of high archaeological potential.

The geo-referencing of the c.1917 Block Plan of Plant and the R.O.F. Pembrey Layout of Factory (SUPP10/72, BD25/83) has been key to understanding the phasing of the site and the whereabouts of surviving features.

The use of the site can be broadly broken down into three phases; Phase 1, the Dynamite factory (PRN 9039), Phase 2 the First World War factories which include HMF Pembrey (PRN 106519) and the National Filling Factory (PRN 109252), and Phase 3, the Second World War ROF Pembrey (PRN 16246). The extents of each of these factories have been mapped:

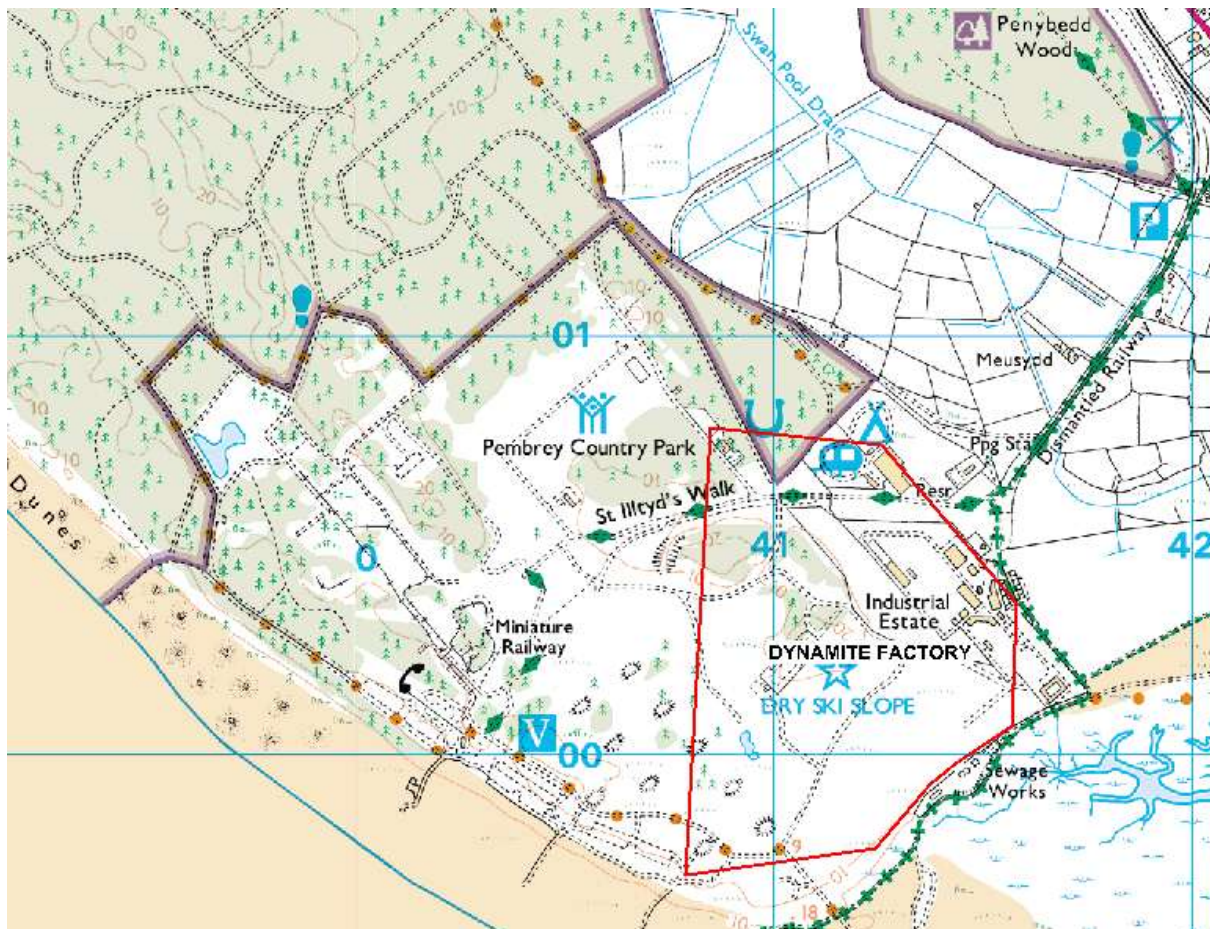


Figure 4: Extent of the Dynamite Factory (PRN 9039) based on 2nd edition OS map (revised 1905).

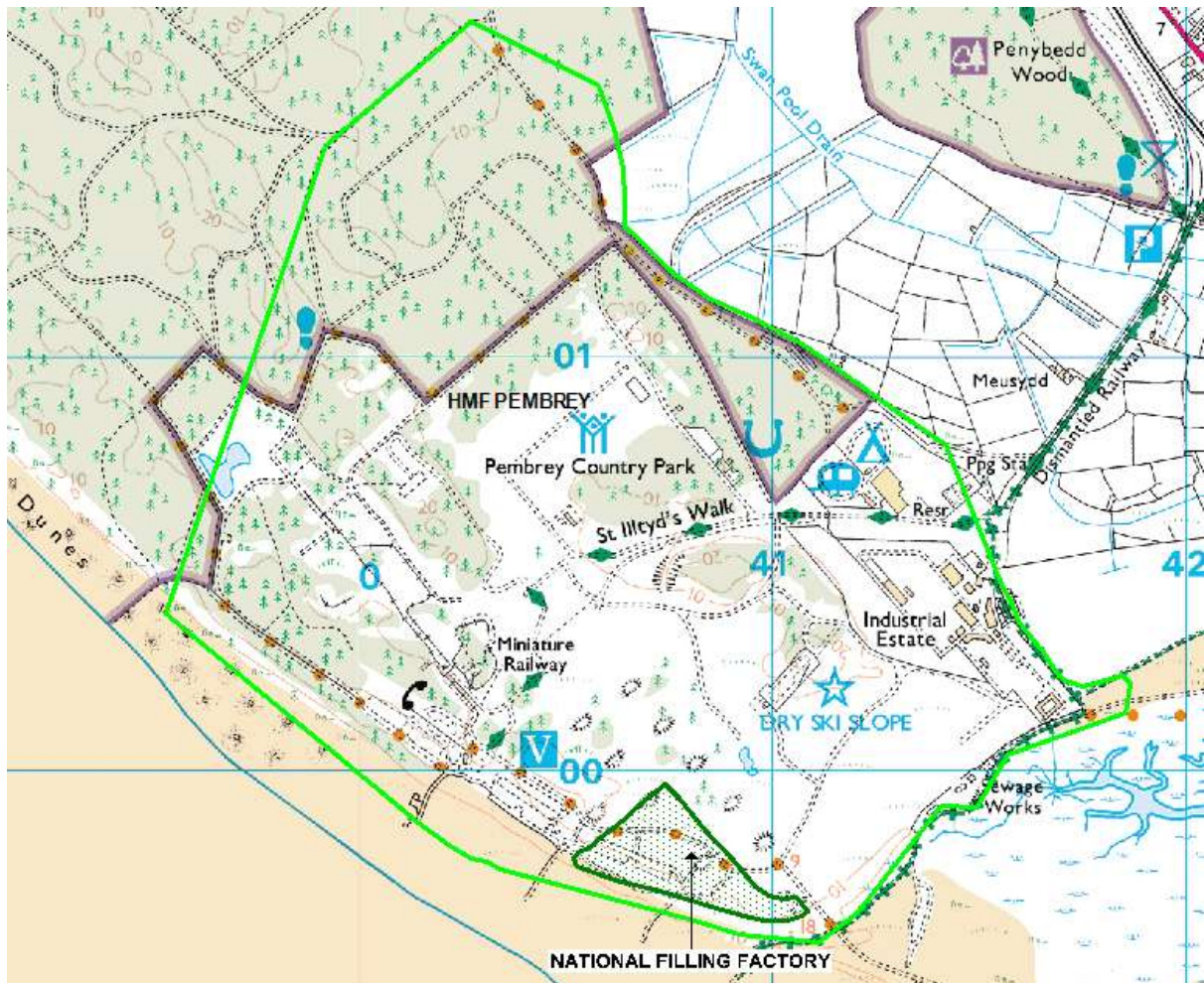


Figure 5: Extent of HMF Pembrey munitions factory (PRN 106519) and the National Filling Factory (PRN 109252), based on the c.1917 Block Plan of Plant.

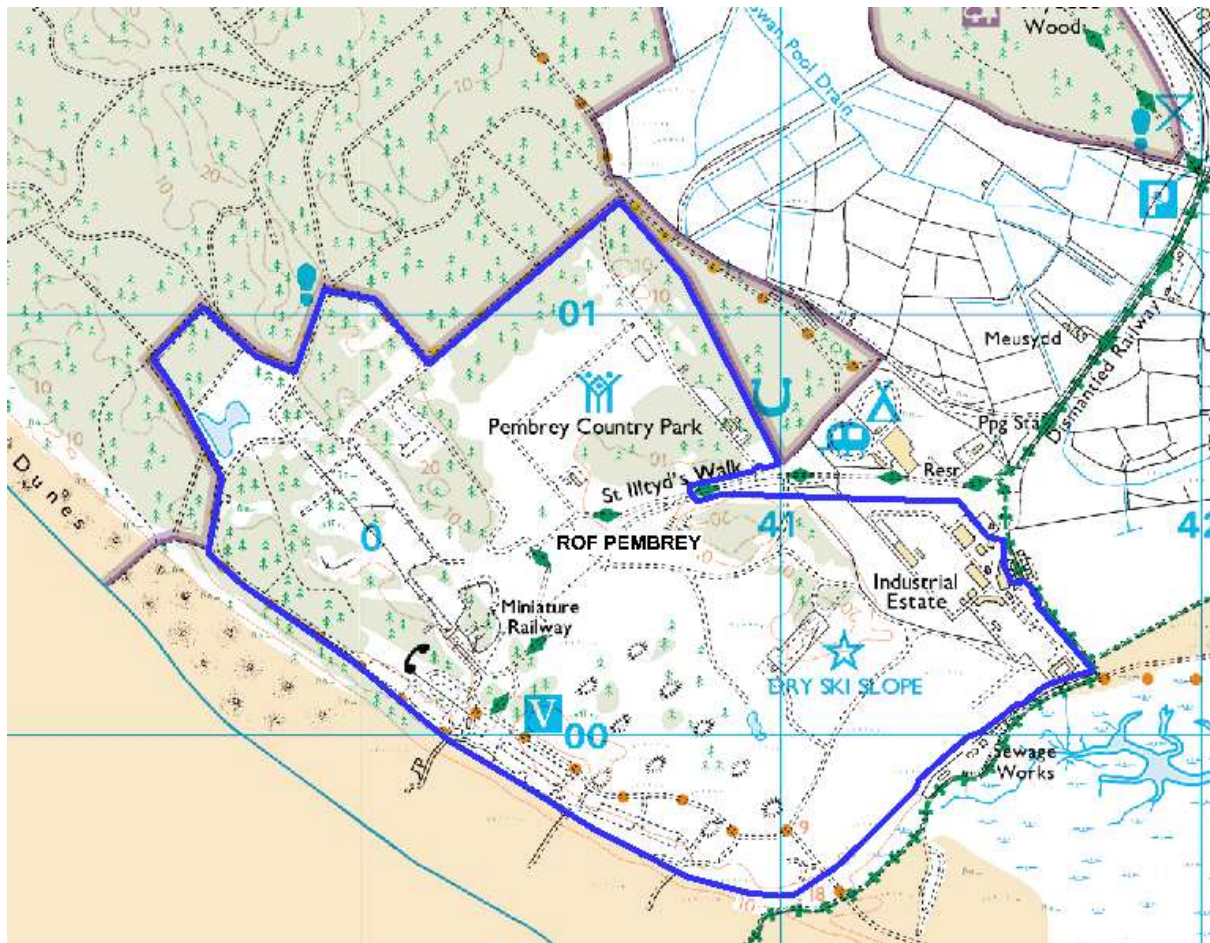


Figure 6: Extent of ROF Pembrey (PRN 16246) based on 1961 Layout of Factory.

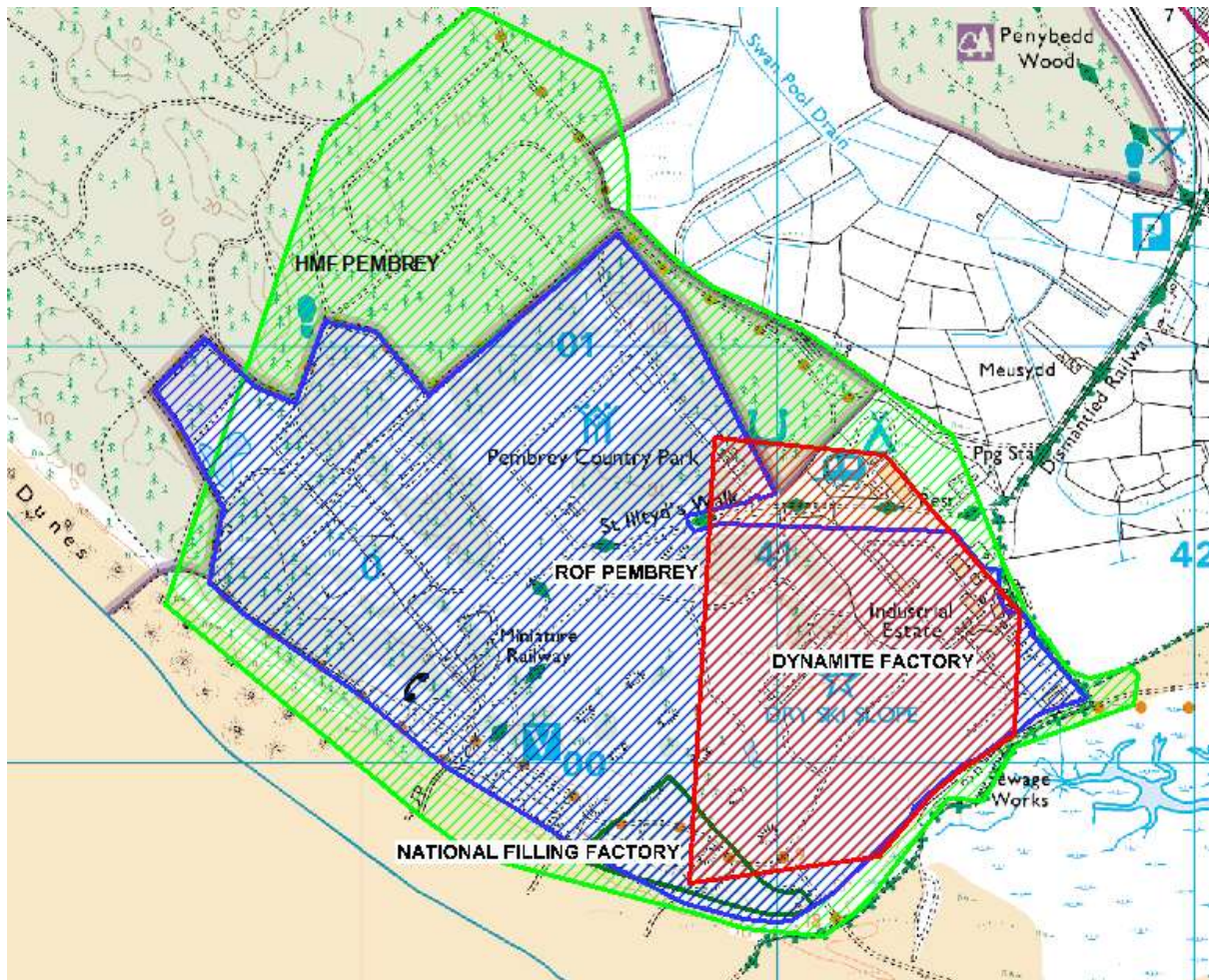


Figure 7: Extent of Factories overlaid showing Dynamite Factory in Red, HMF Pembrey and National Filling Factory (c.1917) in green and ROF Pembrey in blue.

Phase 1: Dynamite Factory

The only sources available currently which indicate the extent of the dynamite factory are the 2nd edition Ordnance Survey map (Carmarthenshire LVII.NE, surveyed 1878-86, revised in 1905, published 1908, Fig. 31)). This shows the factory out of use and labelled 'Old Dynamite Works'. Overlaying and comparing the extent of the factory with the later works shows that the location of the factory and the buildings within it were cleared and new structures built in their location. The only feature which appears to correspond to anything shown on the second edition is possibly a topographic feature – a horseshoe shaped bund or bank within which the 'Old Dynamite Works' is represented. The c.1917 plan of plant shows a similar shaped bank in the same location.

Today fieldwork has shown that this bank has been replaced by a large mound, the outer edge of which corresponds to the outer slopes of the horseshoe bank. No other features within the factory have been identified, however the line of the old tramway (PRN 8670) linking the factory across the dunes to Pembrey Harbour (PRN 5344), survives in part as the course of the footpath crossing the eastern part of Pembrey Burrows towards the harbour.

Phase 2: HMF Pembrey and National Filling Factory

The key documentary source is the plan c.1917 Block plan of plant (SUPP 10/72) (Fig. 26). This plan is undated, but the naming of the factories on the plan indicates that it must post-date the nationalisation of the factories in January 1917. This plan clearly indicates both the extent of the factories, but also shows internal subdivisions including a boundary which runs through the middle of the factory and divides the TNT producing area to the east of the factory and the propellant cordite producing areas and factory magazines some distance to the west. The north-east part of the factory includes the support areas including the administration buildings, workshops, raw material stores and acid plants, convenient for the incoming railway facilities. In addition a diary held in the IWM, written by Gabriella West, a police woman who worked in the factory in 1917,

provides a fascinating description of the site, the processes which took place and the working conditions.

TNT plant

Nothing of the TNT area survives, and comparison with the later plan of ROF factory and photographs from 1938/9 show that this was extensively cleared and redeveloped (Fig. 18). No surviving structures have been identified from this part of the site.

Cordite production

It is not intended to detail the manufacturing processes in detail, as that has been covered extensively in other publications (Cocroft 2000, Pullen *et al.* 2013). However, below is a short overview of the processes of cordite manufacturing based on the publications mentioned to help the interpretation of the remains. Structures related to the process which are identified at Pembrey are highlighted in bold.

Cordite is produced by blending dry guncotton with nitroglycerine. Guncotton is an explosive made by treating cotton waste with nitric and sulphuric acid. Whilst documentary sources suggest that some of this was brought in ready-made to the factory, it was also manufactured on site. Evidence for this comes both from the plan of the site (which itemises a Raw Cotton Store, Guncotton pulping house and a Cotton nitration house, all elements of the production of guncotton), and also the description of Gabriella West who describes the process from its raw state, through teasing, soaking in acids (nitric, sulphuric, oleum and water) then boiling in soda and water, pulped and then pressed. To store dry guncotton is extremely dangerous and so it was stored wet until required.

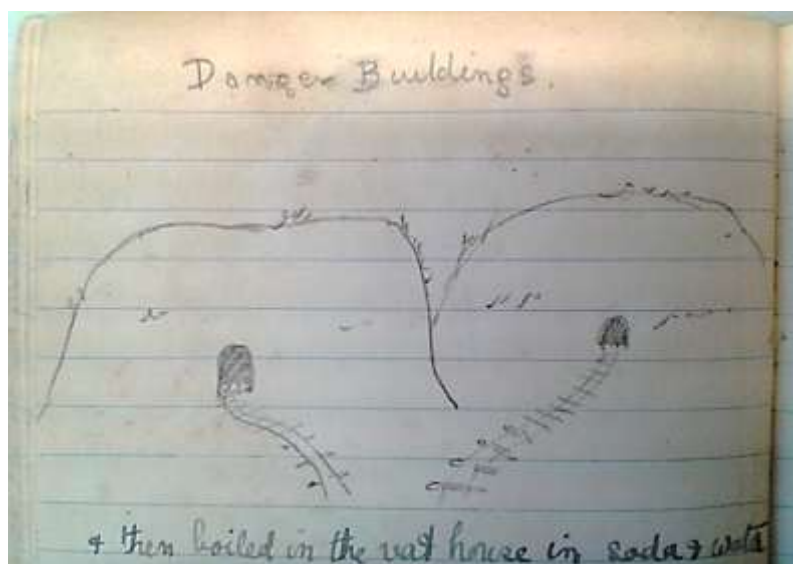


Figure 8: A drawing from the diary of Gabriella West showing the danger buildings at Pembrey.

To make cordite guncotton had to be dried in **guncotton drying stoves** and then weighed in a **weighing house** before being combined with nitroglycerine.

Nitroglycerine is made from treating glycerine with concentrated nitric acid and sulphuric acid. This took place in a structure constructed and located to make use of gravity and was commonly known as 'The hill'. These **nitration-separator** structures would have double height earthwork banks encircling them, and within it a building of several levels. An adjacent charge house (often located on the surrounding banks) would release the necessary acids, which would be mixed together before introducing glycerine. This process generates heat and so the nitrator had to be constantly cooled, in addition a tank of water beneath it would allow the mix to be released into it if it started to overheat. The resultant nitroglycerine would be run off through lead lined gutters to a **wash house** and further filtration.

To make cordite guncotton would be soaked in nitroglycerine to make cordite paste and taken to a **mixing house** and then stored in an **explosive magazine**. A mineral jelly and acetone were added to the cordite paste and blended to make it malleable. Acetone was in short supply during the First World War, and it is believed that sites in Carmarthenshire (PRNs 22535 & 109253) were producing acetone for government use and may have supplied the factory at Pembrey. The paste

was then pressed and extruded into long cords (hence cordite) – narrow for rifle cordite or large diameter ordnance. Then the acetone was driven off by baking the cordite and then distilled in the acetone recovery plant. The finished cordite was sorted to batches of the same size in a blending house and packed for storage in a **magazine** ready to go to the **Filling Factory**.

Cordite production areas

The cordite producing areas lie over the western half of the factory site where large areas survive as earthwork remains. Two distinct areas of cordite production have been identified, one in the central area of the site, Cordite Production Area A and a second which lies to the north-western extent of the site, Cordite Production Area B (see Fig. 9).

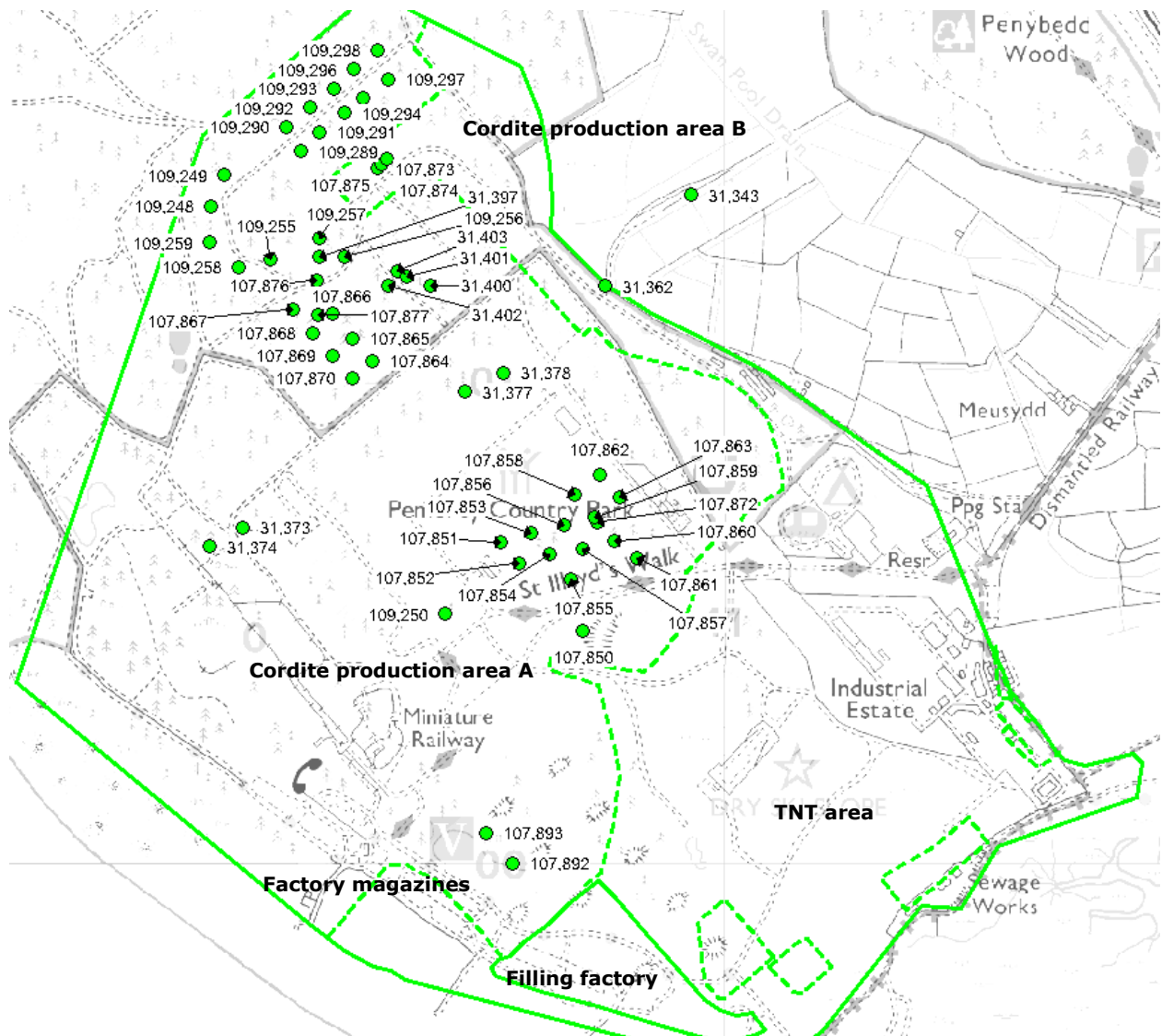


Figure 9: First World War sites recorded as surviving within Pembrey Country park.

Cordite production area A

Cordite production area A consists of PRNs 107850 – 107863, 107872 and 109250 and survives in an area which now falls to the north of the visitor centre. Here in an area of woodland are fifteen earthwork banks, circular or sub-rectangular in plan. These earth and sand banked enclosures are labelled on the c.1917 plan according to their function, which relates to the manufacture of cordite paste from guncotton and nitroglycerine, as described above. The enclosures surrounded the 'danger buildings' of the First World War. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through a curved brick built

tunnel. The enclosures are approximately 20m in diameter, the banks 3m high and the tunnels c.8m long.

The tunnels curve in whichever direction required to enable a tram to exit the structure and join a connecting tramway. The tunnels are well constructed with round arched roofs over which the bank continues above. In some tunnels there are traces of concrete or cement floors. In the sides of the brick tunnel walls, at approximately 4 brick courses high, are the remains of bronze or copper pegs or nails.



Figure 10: The entrance tunnel of enclosure PRN 107854.

No buildings survive within these structures, but within one enclosure the traces of structures were identified. PRN 107683 is particularly interesting as within the enclosure a structure is identifiable by a brick foundation course running NW-SE, and three iron bolts project from the brick foundation which would presumably have fixed a wooden superstructure (Fig. 11). Artefacts lying within the enclosure include fragments of a rubberized material or lino and a Trimsaran brick. A 'Coedely' brick lies on the exterior of the enclosure.

It is also of interest as the tunnel entrance has been converted into an Air Raid Shelter (PRN 109254), with partially blocked entrances at either end. Above the low entranceways are ventilation holes left open in the brick-work. The splayed tunnel entrances also have a blast wall protecting the entrances. Within the tunnel low brick piers are arranged along either wall which would have supported bench seating (Fig. 25).



Figure 11: PRN 107863 showing brick foundation course.

To the south of these structures, on the south side of the main access road into the park which has cut through the cordite production area, and characteristically located on a high point is the remains of the Nitrator Separator House PRN107850. Here are the remains of an earth and sand embanked circular enclosure with three brick arched entrance tunnels through the banks, leading to the northeast and northwest. One tunnel is 1.52m wide leading to the NW, a second is 0.9m wide leading to the N and the third is 1.85m wide leading to the NE. The first two have a cement render skim, the third is brick with no finish and a brick floor. The enclosure is shown and labelled on the HM Factory Pembrey of 1917 plan as one of the Nitrator Separator Houses and would have been linked to washing houses to the west, but which have been destroyed in the later reuse of

the site in the second world war. It is located on a high ridge above the other cordite mixing areas in order to allow gravity to run off nitroglycerine which was too dangerous to pump or carry.



Figure 12: The remains of the nitrator separator house PRN 107850.

Cordite Production Area B

A second area of cordite production has been identified extending into Pembrey Forest. PRNs 107864 – 107870, 109248 – 109249, 109289 – 109298 are similar to those features found in the central factory area (Area A), however there are substantial differences which suggest a different phase of construction.

These earth and sand embanked enclosures are also accessed with brick entrance tunnels. They are labelled on the c.1917 plan and follow a distinct progressive order. A series of ten Guncotton drying stoves are arranged in pairs from the north end of the site PRNs 109289 – 109298. Access to these enclosures has not been possible, as they lie in dense bramble and thorn, however they appear to survive as earthworks.

Progressing to the south-west are Guncotton weighing houses and expense magazines PRNs 109248-9, 109258 -9. To the east PRN 109257, is the Nitrator Separator house, again situated on a high mound, which at the time of the survey was inaccessible due to the high level of dense vegetation, but the mound itself is visible. A sequence of seven enclosures represent the remains of the Cordite Mixing Houses (PRNs 107864-70), where the dried guncotton and nitroglycerine were mixed to create cordite.

All these structures are very overgrown and access was severely limited, however where limited access for recording was gained the structures differ from those seen in Cordite Production Area A. The brick lined tunnels are not as clearly curved in plan and do not have brick arched roofs. Here they are constructed with concrete slabs and a number of them have concrete floors with the impression of wooden sleepers surviving. In addition there is a second access tunnel on the opposite side of the enclosure. This tunnel is commonly narrower and suggests a pedestrian access tunnel with a brick floor.



Figure 13: Access tunnels into the danger buildings.

A number of the access tunnels have been blocked with breeze blocks in order to create bat roosts.

Also within this dense area of woodland are the remains of a railway platform shown on the c.1917 plan as a railway terminus, and other structures were recorded (PRNs 107873 – 107877).



Figure 14: the remains of a railway terminus in Pembrey forest.

These two areas of cordite production are perhaps the most extensive surviving earthworks, and where the processes of production can be understood with reference to the relevant plan.

Between these two areas of cordite production were areas of Rifle, Ordnance cordite and Ballistite production. This area is again very overgrown but some structures have been identified, including an earthwork bank and brick built tunnel associated with a Ballistite Paste Sieving and Mixing House (PRNs 31403) and associated latrines survive, which appear to be the only freestanding built structures which survive from the First World War plant.

Magazines

Other features identifiable as part of HMF Pembrey include the earthwork banks which surround the factory magazines. The plan shows 18 structures labelled as Factory Magazines, however only two have been identified as surviving (PRN 107892, 107893) the rest have been destroyed in the construction of the later ROF factory magazines.



Figure 15: The entrance to a factory magazine

These structures follow the same pattern of circular earthwork banks accessed by a curving brick tunnel and a concrete slab roof.

National Filling Factory

The location of the Filling Factory at the southern corner of the site has suffered most extensively from the clearance of the site, in the first instance in the redevelopment for the ROF prior to the Second World War and then finally in the clearance of the site prior to its establishment of the Country Park. No structures relating to the Filling Factory have survived.



Figure 16: the view from the Filling Factory showing the railway curving away to the North c.1917 (MUN 5/155).

Phase 3 – ROF Pembrey

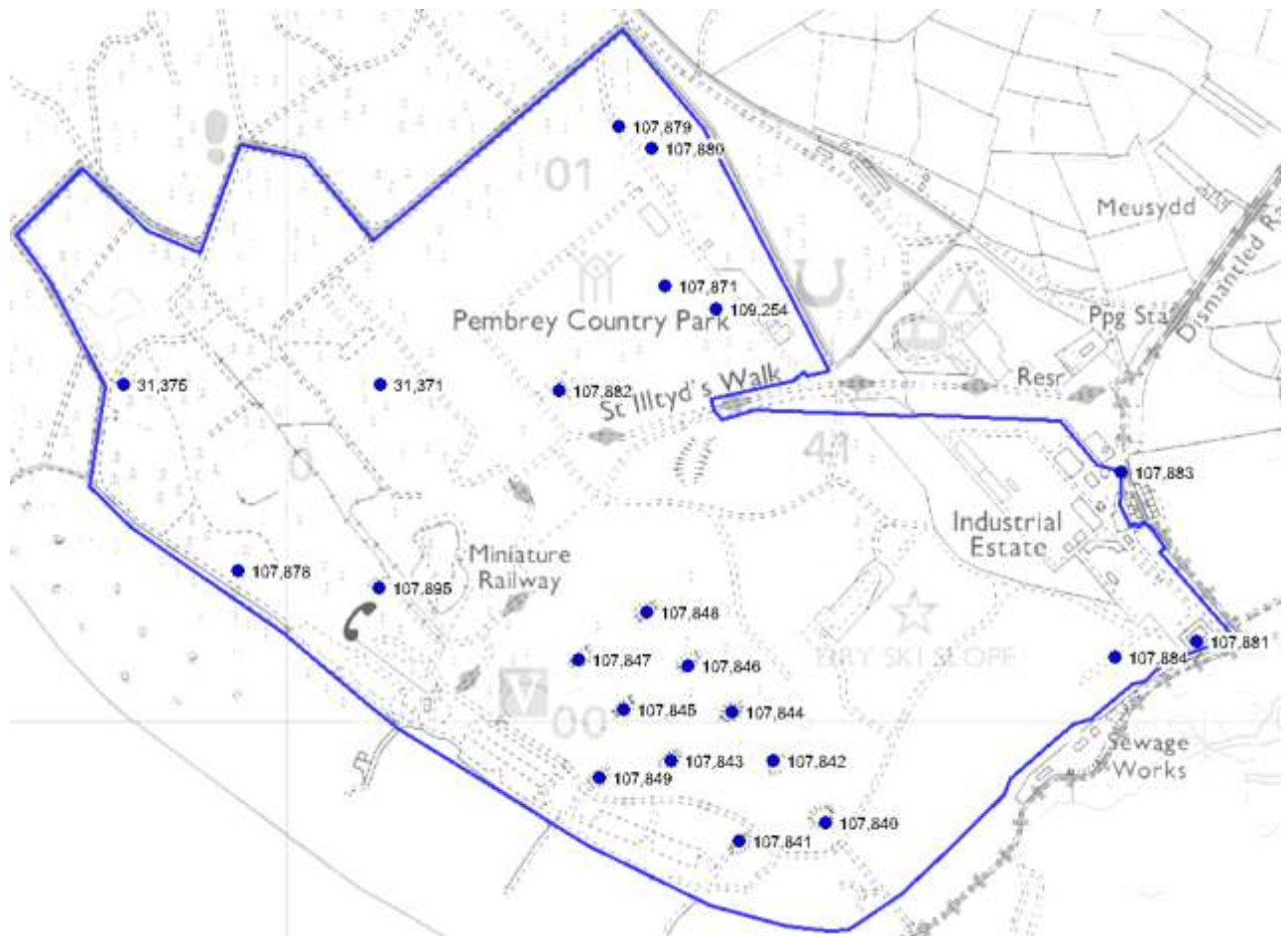


Figure 17: Second World War sites recorded as surviving within Pembrey Country park

The extensive clearance of the site in the 1970s in preparation for the country park led to the wholesale demolition of most of the ROF structures, and a good proportion of it is most likely buried beneath the sand, woodland and the now pristine grassed recreational areas. However, there are some features which remain as monuments to the massive plant that once occupied the site. The full analysis of these remains has been hampered by the lack of a schedule which should accompany the plan of the ROF site. The plans of the site which have been recovered from The National Archives, Llanelli Library and other sources have all become detached from their schedule which itemises those buildings and their functions. Some of the construction contracts from 1938-39 do help in identifying buildings, but by no means all and so strangely, some of the buildings are more of a mystery than those from the First World War. Whilst this has been an inconvenience, because the focus of this study has been identifying the extent and survival of the structures from the First World War further lines of enquiry have not been explored. Further study of other ROFs would undoubtedly shed light on the processes and structures of this factory. A good collection of ground and aerial photographs have also been provided by a former country park ranger, Dave Hughes who has been researching the history of the site.



Figure 18: General view looking NW showing Building P3 (steelwork) and clearing of site for Building P1 dated 29/8/1938.



Figure 19: Images of the ROF site provided by Dave Hughes.

A number of standing structures do survive, these include the entrance gates to the factory, PRN 107883, and other isolated buildings PRNs 107881-2 and the footprints of some of the administration buildings, and stores survive at ground level.

Magazines

The most impressive remains of the site from this period are the magazines, shown on the plan of the layout of the factory (BD 25/83). There were formerly ten magazines but nine survive in substantial form, PRNs 107840 – 49. These are massive concrete structures with earth and turf mounds covering a concrete structure composed of 3 internal chambers, with an access walkway and ventilation surrounding the structures internally. A standard gauge railway with loading platform survives within, and some still have a buffer stop intact.

Sales particulars of the site dating 1963 describes them as,

"Reinforced concrete construction, mounded and each forming:-

3 Chambers measuring internally 26' x 15' X 7' 6" ht. with Boot Changing Room, Sampling Room and Access Tunnel with loading Bank and Rail-siding (Detailed plan available) Floor space 30830 (BD41/236).

Plans for the specification of the magazines also survive within The National Archives (WORK13/139) along with photographs of their construction (WORK 26/21).

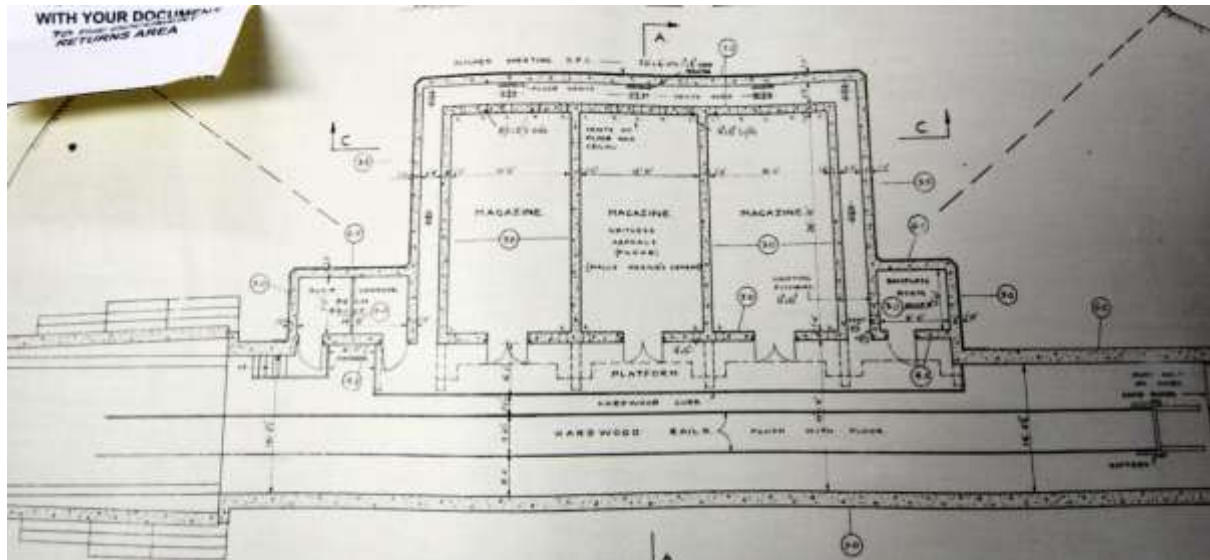


Figure 20: Plans for the construction of the Magazines (WORK 13/139).



Figure 21: Photograph of magazine no 8 under construction, dated 13/6/1939 (WORK 26/21).



Figure 22: Photograph of Magazine no 8, PRN 107847 in November 2015.



Figure 23: Interior showing platform and rail access, magazine no 7 PRN 107846.

In addition to structures associated with the manufacture and breaking down of munitions are those associated with the protection of the site. These include a pillbox located in a position to overlook the marshalling yard and the road and rail entrance gates (PRN 31370), and a number of observation posts have been identified (PRNs 31371, 107871, 107878), these follow a bespoke design for Royal Ordnance Factories - they are small square pillboxes with a blast wall covering the entrance and small embrasures which suggest they were designed more for observation than defence (Pillbox Study Group).



Figure 24: PRN 107871 lookout post.



Figure 25: PRN 109254 Air Raid Shelter constructed within one of the earlier entrance tunnels to a cordite paste mixing house PRN 107863.

Both standard gauge and narrow gauge railways have been employed around the site, and evidence of railways appear preserved below many of the current footpaths.

DISCUSSION

The project has been successful in establishing the archaeological legacy of the First World War at Pembrey. In order to do this the different phases of the site had to be understood in order to understand the features which survive.

It is clear that the earliest phase of the site from the 1880s has been effectively removed as part of later clearance and construction. Of the period covering the First World War there is substantial and extensive survival of earthwork structures and clearly a high potential for further buried archaeological deposits. Documentary sources indicate that through the First World War there were phases of construction and expansion to meet the demand which is widely acknowledged as the 'shell crisis' of 1915. The archaeological remains suggest that the factory developed in phases; there are two distinct areas of cordite production within the plant and these both survive as earthwork remains. Whilst the two areas of cordite production are similar, they exhibit substantial differences in construction; those earthworks built in cordite production area A have brick arched tunnels entering the danger buildings. Cordite production area B differs in that the tunnels have concrete slab roofs and also a second tunnel provided opposite the first. It is suggested therefore that this is a secondary, later area of cordite production and may represent the expansion of October 1915 for ordnance, rifle cordite and ballistite production (HMSO Pt II, Chapter II p69-70). The two remaining factory magazines from the First World War which survive in earthwork structures are also similar in construction to Cordite Production area B, although the secondary tunnel does not appear to have been built.

There is further work to be done to establish detail. Other structures have been identified, often surviving as brick foundation courses visible in the ground surface and these indicate a wider and complex archaeological landscape which has only been touched on currently. Vegetation levels are very high in many of these areas and prevent close inspection. In many places substantial pine trees grow both on the earth and sand banks and also grow above the tunnels. The trees are potentially damaging in loosening masonry through wind-rocking and also through tree throw pulling a substantial root plate out. Ideally management would maintain a stable environment for the structures, removing trees which are potentially threatening to the banks and structures. Whilst LiDAR has been consulted for this survey, there is scope for further and more detailed work which would help penetrate the extensive areas which are effectively inaccessible by foot.

The recognition of the earthworks which represent the remains of the factory suggest an extensive and rich archaeological landscape which is not yet fully understood. Detailed topographic survey would enable a more detailed archaeological understanding of the site.

SOURCES

The primary sources found in The National Archives including the plan of factory (SUPP10/72) and ROF Pembrey (BD25/83) have been the most helpful in establishing the layout of the factory in the First World War and overlaying this with the modern Ordnance Survey data has made it possible to identify features on the ground and their phase of construction. The c.1917 plan has, due to having a schedule, enabled the features to be identified in relation to the factory processes. However, it is not clear if this plan represents the layout as proposed, or as constructed, and we do not fully understand how closely or accurately the plan represents the plant as it was built.

Secondary sources have then provided a narrative history of the site, most usefully the resume in the History of Munitions (1922) has provided a timeline for construction, production and expansion. The newspapers available online have also been very useful in providing a narrative.

RECOMMENDATIONS

The project has demonstrated that large areas of the factory remain as significant archaeological earthworks, however current conditions have prevented further detailed investigation. Therefore the following recommendations are made for future works;

- Further topographic survey of features in the western region of the site, including Cordite production areas A and B and the woodland areas in between,
- Further analysis of the plan and buildings shown on the c.1917 plan would provide information on the different processes undertaken at the plant and the structures which survive,

- Further analysis of earthworks from LiDAR data, stripped of vegetation, to identify areas of earthworks which are otherwise difficult to access due to levels of vegetation.
- Analysis of other ROF factories to understand the function of the surviving structures within the park,
- Recording the associated features including rail spurs with GWR mainline, and the associated housing scheme in Burry Port.

In terms of conservation management of the site to provide a stable environment for the archaeological remains to survive in the longer term the following recommendations are made.

The aim of management should be to provide a stable ground cover in order to;

- improve visibility and accessibility of structures
- reduce the risk of damage to structures from tree rocking and wind throw

TIMELINE

November 1881	Stowmarket Explosives Company apply for a license to manufacture dynamite amongst the sand dunes of Pembrey Burrows.
17 th November 1882	An explosion at the dynamite factory kills seven people, the youngest only 13 years old, the oldest 24. The explosion was heard in Tenby.
22 nd May 1885	Explosive manufacture ceased and staff were dismissed but the site continued to store and distribute explosives.
13 th May 1893	A serious fire led to three sheds being destroyed at the dynamite works.
October 1914	Nobel's Explosives Manufacturing Co. agree with the Secretary of State for War to erect and manage a TNT factory at Pembrey
April 1915	Between 800 - 1000 men are employed building the new Explosives Factory.
May 1915	Explosives manufacture underway.
2 nd July 1915	The filling of shells began in a separate filling factory.
July 1915	TNT production began
January 1916	Cordite paste production began
March 1916	Manufacture of rifle cordite and ballistite began .
May 1916	Manufacture of ordnance cordite began.
1 st January 1917	Both factories were nationalised and under the Ministry of Munitions
May 1917	The Filling factory continued filling shells and started breaking down defective ammunition and recovering components
14 th July 1917	An explosion killed 6 people, the cause of the explosion was never explained.
18 th November 1918	An explosion killed 3 munition workers from Swansea when disassembling an 18 pounder shell.
5 th October 1926	The sale of the Factory and premises took place at the Hotel Metropole, Swansea. It was sold for scrap for £30,000.
1930s	The administration buildings were used as a school camp for children of unemployed miners of South Wales.
July 1938	Construction started on a new Government munitions factory
December 1939	Royal Ordnance Factory (ROF) Pembrey opened and TNT production started.
10 th July 1940	A German plane dropped several bombs 10 workers were killed.

1 st November 1941	An explosion in the mono-nitration plant killed 2 men. The British Empire Medal was awarded to two men as a result of their 'courage and devotion to duty' in averting further injuries and damage.
1944	ROF Pembrey begins decommissioning munitions.
1950	Outbreak of Korean War – demand increased for munitions
1964	The Royal Ordnance Factory Pembrey closed.
1980	Pembrey Country Park was opened.

ACKNOWLEDGEMENTS

Firstly thanks to Cadw for funding and supporting the project and Jon Berry for his assistance.

Carmarthenshire County Council provided access and support, and most importantly warm, dry and welcoming accommodation for fieldworkers to dry off. Simeon Jones who manages the conservation of the park has been helping with the project at every stage.

Thanks to an incredible group of volunteers who turned up despite the wet weather and stayed to the bitter end; Neil Matthews, Heini Evans, Gaby Lester, Nick Oldnall, Veronica Haines, Nia Haines, Theo Davies-Lewis, Sharon Evans, Anne Marie Foley and Dyfrig Foley, Phil Warren and lastly Tony Coombe who has also done a vast quantity of desk-based research.

Dave Hughes former ranger in the country park has been providing information and photographs that he has amassed over the years and his extensive knowledge of the site has been invaluable.

Others have provided information over the phone and by email, Roger JC Thomas English Heritage, Robert Protheroe-Jones and Mark Lucas of the National Museum of Wales.

Thanks to Stephanie Jayne Thomas of the Cefn Sidan café who has provided many welcome cups of coffee and also shared her knowledge of the site.

Thanks also to the Archives – the National Archives, Llanelli Library, Ceredigion Archives, Carmarthen Archive Service and Terry Wells for his splendid copying service.

Thanks also to Avalon Weston / Sarah West, the great-niece of Gabriella West for allowing the reproduction of Gabriella's diary extracts, which we look forward to seeing in a published format soon.

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APPENDIX A - MAPS AND AERIAL PHOTOGRAPHS

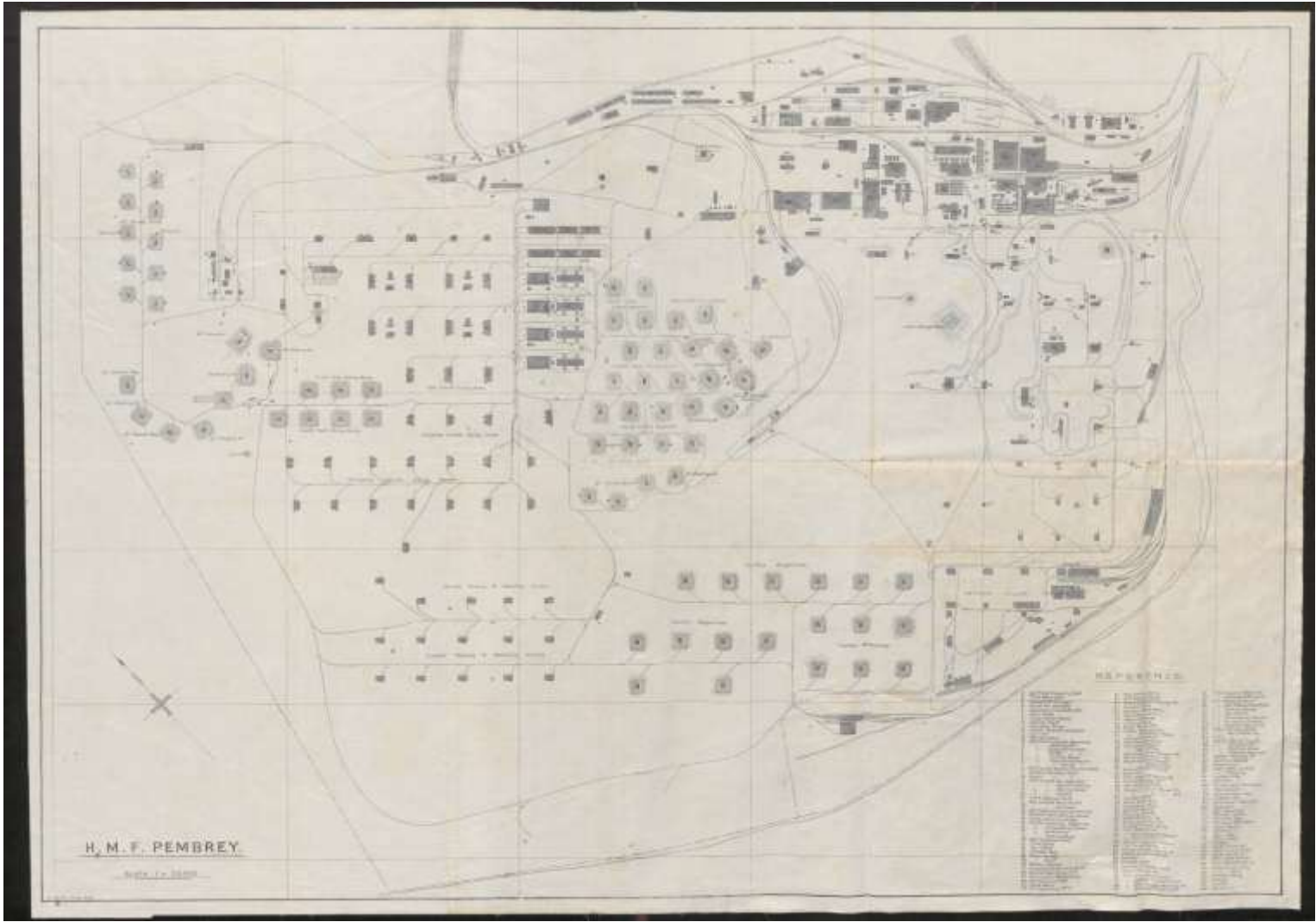


Figure 26: c.1917 Block plan of plant SUPP 10/72.

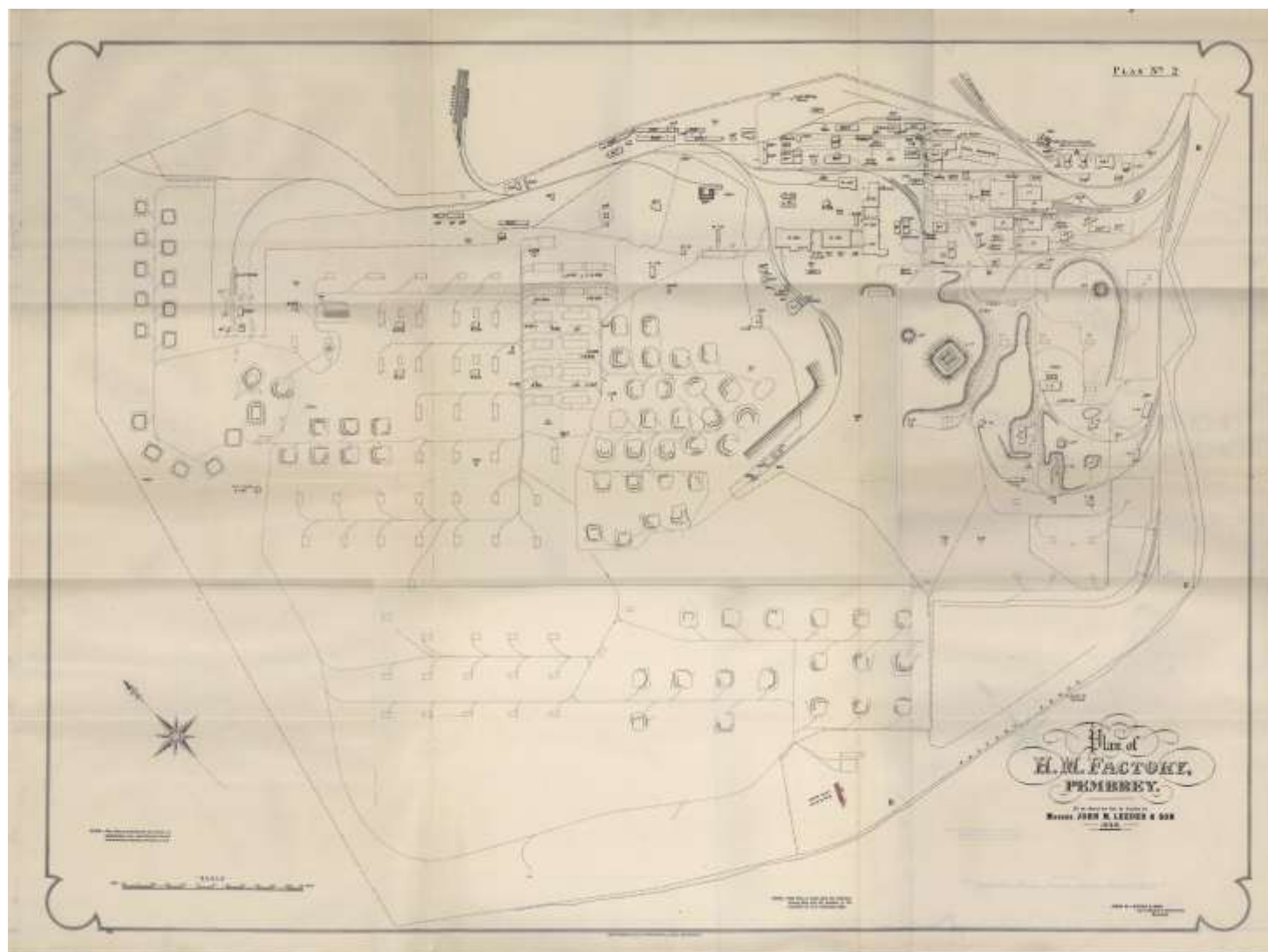


Figure 27: Map from sale catalogue 1926 (Carmarthen Archives).

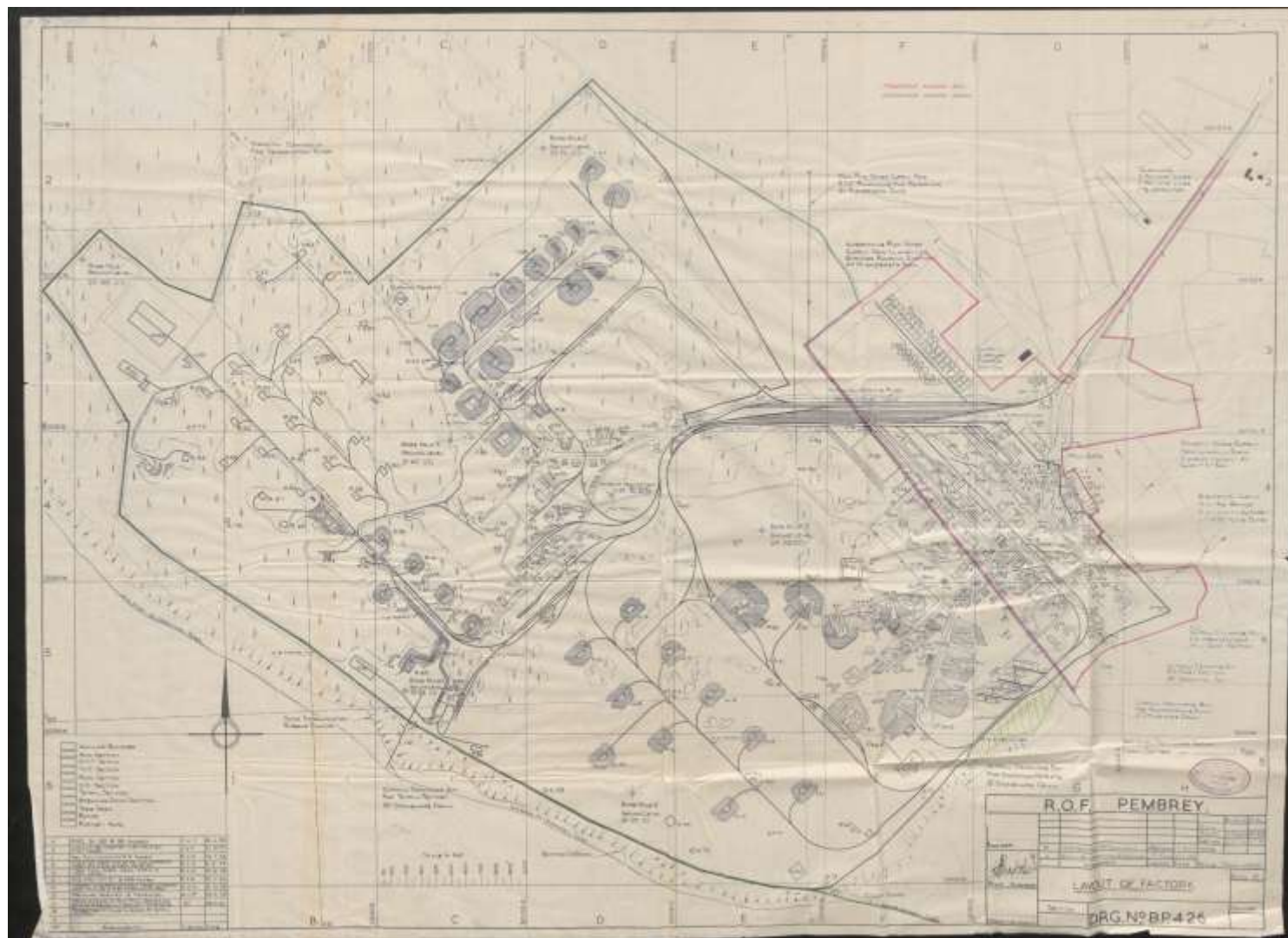


Figure 28: ROF Pembrey BD 25/83.

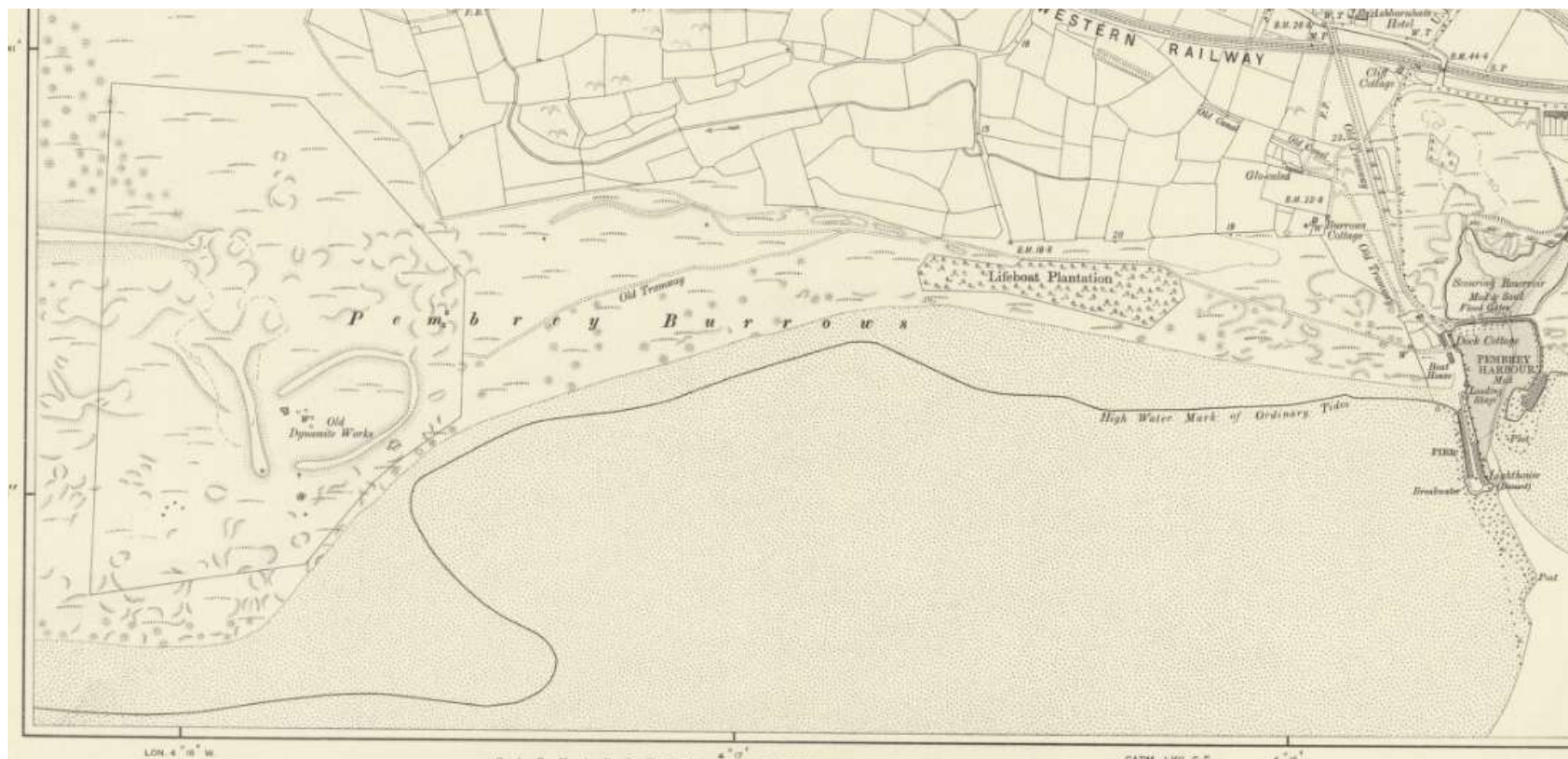


Figure 29: Ordnance Survey second edition, Carmarthenshire LVII.NE, surveyed 1878-86, revised in 1905, published 1908. Ordnance Survey second edition, Carmarthenshire LVII.NE, surveyed 1878-86, revised in 1905, published 1908.

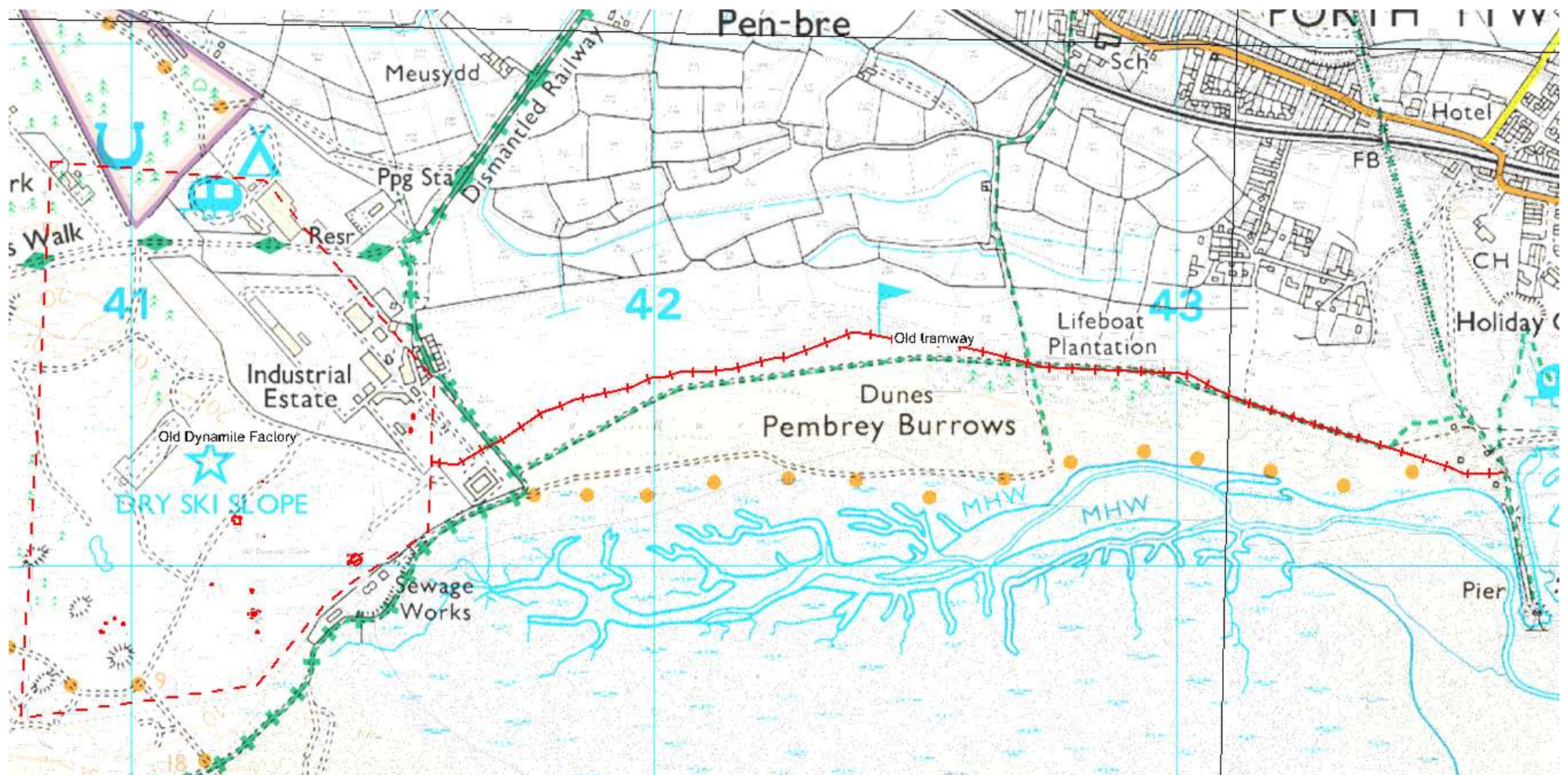


Figure 30: Boundary of 'Old Dynamite Factory', scattered structures within and 'Old Tramway' to Pembrey Harbour, plotted from Ordnance Survey 25 inch, sheet 57.07 published 1906.

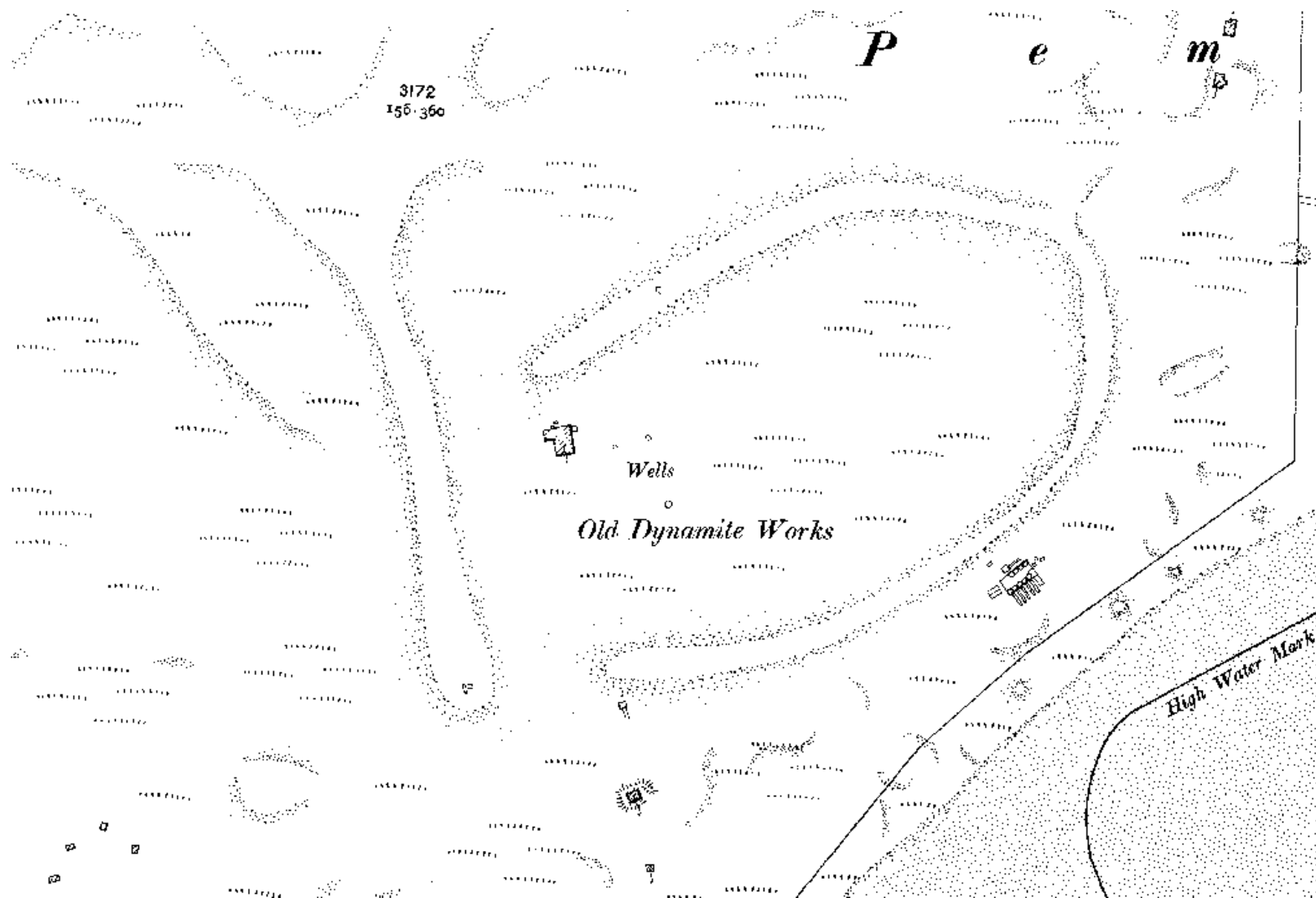


Figure 31: Old Dynamite Works as recorded on the OS 2nd edition revised 1905, published 1908.

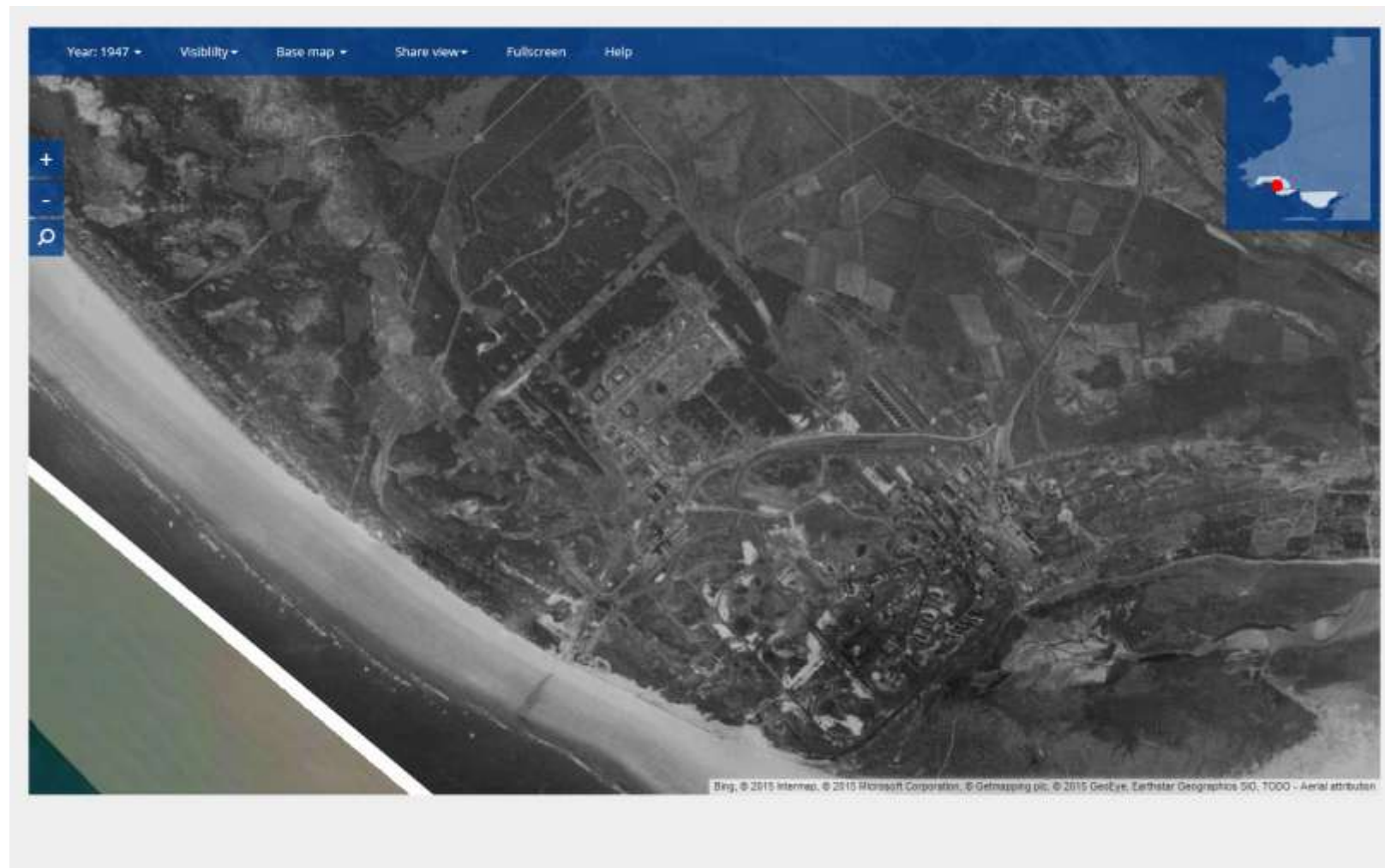
APPENDIX B - AERIAL PHOTOGRAPHS



Welsh Government, Medmenham Collection MWO 17/19, 1st July 1940 (Central Register of Aerial Photographs for Wales).



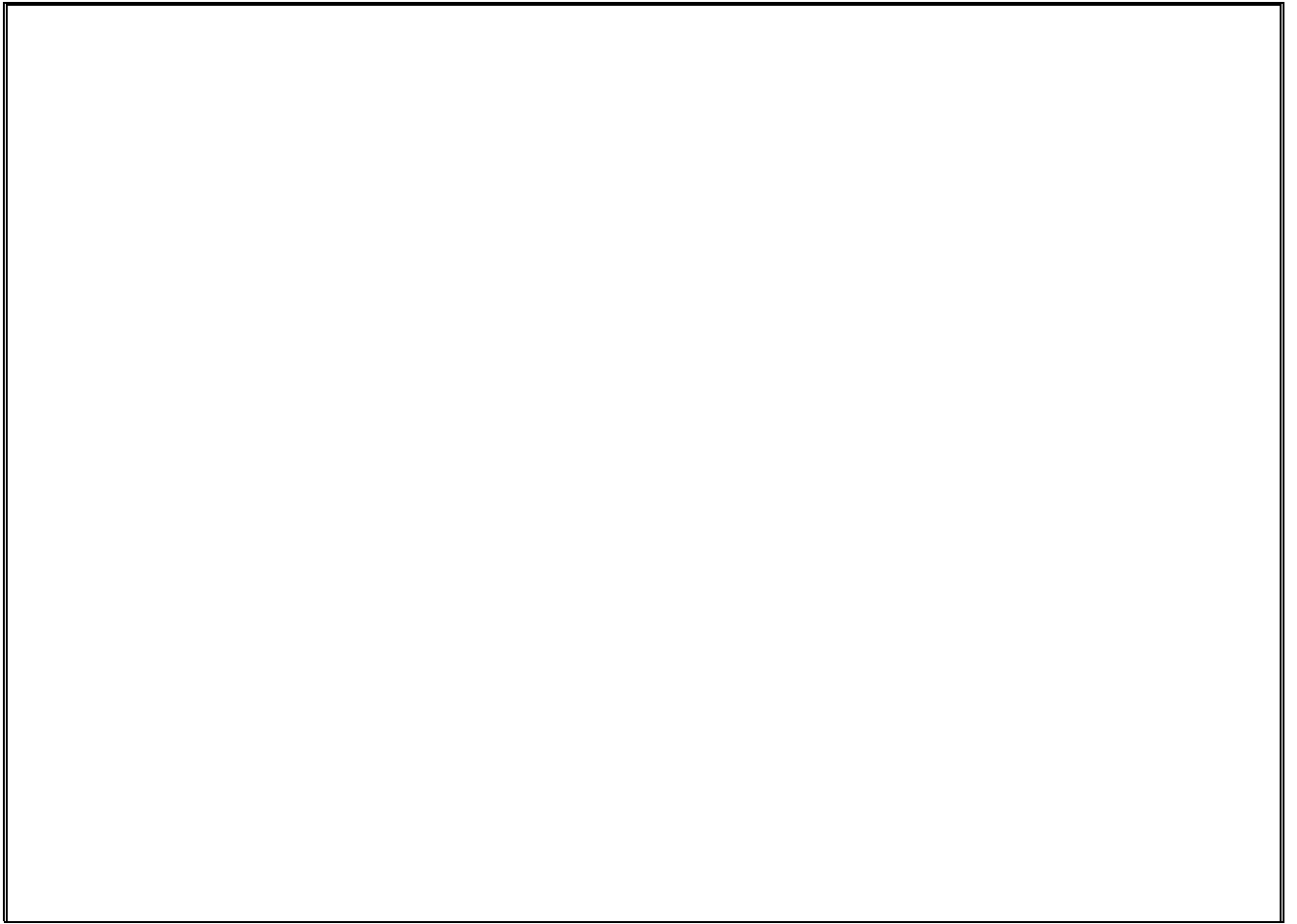
Welsh Government, Medmenham Collection, M1281_1014a 8th March 1944 (Central Register of Aerial Photographs for Wales).





APPENDIX C - OUTREACH AND SITE RECORDING FORM

SITE RECORDING SHEET			
Site Name:		PRN:	
Community:			
Site Type:			
National Grid Reference:			
Sources: (Yes / No): Tithe Map ... OS 1 st ed. ... OS 2 nd ed. ... Recent OS ... Other (Please Specify):			
Date of recording:			
Recorded by:			
Site Description: What does it look like? What is it made of? What do you think it is? Any idea how old it is?			
Photo Record No:			
Site Condition: Is it in good condition / fair / poor / damaged			
Site Threats:			
Overall plan: Show direction of North and approximate measurements			



Detailed sketch plan / section: Show direction of North and approximate measurements

APPENDIX D – VOLUNTEER FEEDBACK

From: Rhys Evans [mailto:Rhys.Evans@mencap.org.uk]

Sent: 05 November 2015 14:41

To: Alice Pyper

Subject: Hi Alice

Hi Alice

It was an amazing experience for myself and the team to have had the opportunity to have worked alongside yourself on the 26/10/15. The team really appreciated your knowledge on the topic and were amazed by the structures that were revealed. We hope that the work done on the day will give members of the public as much enjoyment exploring them as we did. To think we have been working at the site for some time and unaware of the structures that had been hidden away over the years by the overgrowth. It was an enjoyable day that the team were very happy to have been part of. Our participants were very thankful for being included and have learnt some useful skills while using the tools to clear the brambles and making the paths accessible.

Thank you

Rhys Evans

Carmarthenshire Motivate

Facilitator

Exploring our deep heritage

I NEVER imagined to be crawling beneath an abandoned concrete munitions plant on a cold and wet Saturday morning in Pembrey Country Park.

Working with the brilliant team at the Dyfed Archaeological Trust exploring and recording the munitions factories was an experience I will never forget.

As many locals will know, among Pembrey's acres of woodland and vegetation lies the remains of munitions plants and bunkers used in the First and Second World Wars.

The locations of these sites are known to anyone who happens to pass them by during their visit to the Park.

However, not many people have recorded or explored these sites formally in recent years – which made our task of going inside the numerous concrete structures even more exciting.

The history of the site is incredible. Firstly, back in the late 19th century Pembrey was home to a dynamite factory which was owned by numerous companies like the New Explosive Company of Stowmarket, Nobel's Explosives Company and then South Wales Explosive Company, a subsidiary of Nobel's. Fast forward to WWI and the site was a TNT and propellant factory – with a considerable emphasis on the production of shells.

ST Michael's sixth form pupil **THEO DAVIES-LEWIS** has been getting involved in local history this week.

As expected, the site closed after the War, but then re-opened in expectation of the Second World War in 1939. Yet again, Pembrey was playing its part in the war effort.

Thousands were employed in dangerous conditions to make sure the Allies were not in short supply of what they needed.

However, most significantly we saw how the site represented a symbol of equality in the early part of the 19th century when women usually were seen to have no importance in society. Many of the workers were local women whose brothers, uncles, husbands and fathers had gone over the English Channel to fight.

With all of its history, it would be impossible to dissect everything we wanted to discover from these concrete giants.

Stepping inside the structure was a strange feeling because of what had happened all those years ago in these dangerous surroundings. After all, at the height of the First World War, an explosion at the site had killed six workers – four men and two women. The

cause of the explosion from the subsequent inquest was unknown.

Luckily for me, I wasn't digging anything up, where the possibility of coming across a shell or any other TNT would have been likely.

Instead, we roamed around the different structures, through the long corridors draped with graffiti and debris from the ventilation shafts – which dotted around the sides of the structure.

What made the day more difficult was the fact we did actually had to do some recording.

Ah, yes, and then it was my turn to actually crawl under the platform into a set of shafts and tunnels underneath the bunkers. The experience showed me that whoever you are you can still get involved with archaeological explorations like this.

The location of this historical site did leave us with many questions. For example, how much ammunition could you fit in these rooms? What was the purpose of the narrow tunnels under the bunker? Would

Theo Davies-Lewis headed to the abandoned concrete munitions plant on a cold and wet Saturday morning in Pembrey Country Park.



workers ever be safe in Pembrey? These questions are ones we hope to answer as we trawl through the walls and rooms of the building.

We saw the remains of old light boxes, transport equipment, as well as the old railway line foundations inside the buildings.

What is so important is that we do get the answers to these questions. Luckily, the Dyfed

Archaeological Trust's project is funded by CADW and the Heritage Lottery Fund, as well as being supported by Carmarthenshire Council.

With this support, organisations like the Trust could uncover more and more information that relates to the site.

It was a poignant experience, highlighted as I was walked out of one of the dark and wet

buildings while something that had been engraved on the wall caught my eye, which read: "Thank you for saving my future, Pembrey."

■ If you have any information, or know anyone who worked at the sites over the years, please contact Alice Pyper from the Dyfed Archaeological Trust on a.pyper@dyfedarchaeology.org.uk

GAZETTEER OF SITES

M. SHINER, Historic Environment Record Manager

PRN - 7224

NAME - ROYAL DOCKYARD **TYPE** - DOCKYARD **PERIOD** - Post-Medieval/ MODERN

EVIDENCE - complex **CONDITION** - Not Known/ DAMAGED

NGR - SM960037 **COMMUNITY** - Pembroke

HER DESCRIPTION -

Pembroke Dock's was established in 1814 and the layout and buildings date mostly between 1814-1926 when the Dockyard closed. It's recorded that 263 vessels were constructed for the Royal Navy, ranging from gunboats to battleships and the Royal Yachts Victoria and Albert I, II and III.

Prior to the First World War the dockyard was in decline with the last warship built at the yard, HMS Defence, launched in 1907. However during the First World War it nevertheless carried out important war work including building light cruisers, submarines and fleet oilers. Roosevelt visited the Dockyard in July 1918 and noted that the number employed there had quadrupled to 4000 since the start of the war and of those workers 500 were women (Phillips 1993, p170).

Five submarines were built at the yard including two J-class submarines which were designed by the Royal Navy in response to the German submarines capable of a surface speed of 18 knots. They were the only triple screwed submarines ever built by the British, and with a top speed of 19 knots they were the fastest in the world at the time of construction. Also built in the Royal Dockyard was one L-class submarine, L10, and two American designed H-class submarines which were so successful they were still in use at the start of the Second World War (Phillips 2013, p311).

During the Second World War it was taken over by the RAF and as a Flying Boat station it was the largest in the world with Short Sunderlands mostly flying from here in the Battle for the Atlantic.

SOURCES -

Phillips, Lawrie 2014. Pembroke Dockyard and the Old Navy

PRN - 8660

NAME - NEW POOL COLLIERY **TYPE** - COAL MINE **PERIOD** - Post-Medieval/ MODERN

EVIDENCE - complex **CONDITION** - Not Known/ DAMAGED

NGR - SN46830126 **COMMUNITY** - LLANELLI RURAL

HER DESCRIPTION -

New Pool colliery was re-opened as a result of increased production for the war effort during the First World War.

SOURCES -

Craig RS, Protheroe Jones R, Symons MV 2002 The Industrial and Maritime History of Llanelli and Burry Port 1750-2000

PRN - 8670

NAME - PEMBREY EXPLOSIVES WORKS TRAMWAY **TYPE** - Tramway **PERIOD** - Post-Medieval

EVIDENCE - Structure **CONDITION** - DAMAGED

NGR - SN42490043 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

A tramway is marked on the 2nd edition OS published 1906, it is described then as 'Old Tramway' implying it was out of use at that time. The tramway provided transportation of goods between the Dynamite Factory established 1882 by Stowmarket Explosives Company (PRN 9039) and Pembrey Harbour (PRN 5344). A.Pyper 2016

SOURCES - Page, N 1998 Coastal Survey 1997-98. Carmarthen Bay, Ginst Point to Loughor. Ordnance Survey Carmarthenshire sheet Second Edition 1:2500

SOURCE 2 RCAHM 1978 18d,CM

PRN - 9039

NAME - PEMBREY EXPLOSIVES WORKS **TYPE** - Explosives Works/ EXPLOSIVES FACTORY **PERIOD** - Post-Medieval/ POST MEDIEVAL

EVIDENCE - Building **CONDITION** - Destroyed

NGR - SN41200010 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

In 1881-2 the Stowmarket Explosives Company began to manufacture dynamite amongst the sand dunes of Pembrey Burrows, with a tramway (PRN 8670) to Pembrey harbour (PRN 5344) providing transportation. Production was curtailed in November 1882 when a terrible explosion killing 7 young people ended manufacturing at the site, it was then used only for warehousing and storage. This first explosives factory on the site was making dynamite not for munitions but for mining and quarrying. The 2nd edition OS map indicates the location and boundary of the factory, along with the a number of buildings, many isolated and dispersed in the dunes. All traces of the factory were lost when the site was redeveloped at the outset of the First World War with the new Nobels' munitions factory (PRN 106519), which was subsequently nationalised in 1917. A Pyper 2016 c.1890. There is a tramway (PRN 8670) leaving the boundary of the works crossing Pembrey Burrows and finishing near Dock Cottage at Pembrey Harbour.

SOURCES - Page, N 1998 Coastal Survey 1997-98. Carmarthen Bay, Ginst Point to Loughor. South Wales Daily News 1881
Ordnance Survey 1889 Carmarthenshire XLVII NE

SOURCE 2 OS 1908 6" Carm LVII NE
RCAHM 1980 17c,CM

PRN - 9151

NAME - FRONGOCH LEAD MINE; LISBURNE; LLWYNWNWCH **TYPE** - Lead Mine **PERIOD** - Post-Medieval

EVIDENCE - Earthwork **CONDITION** - Not Known

HER DESCRIPTION -

Lead ore output-70 000 tons; zinc ore output-53 000 (Figures include Wemyss output). Frongoch mine flourished during the latter half of the 19th century and into the early 20th century. It has been regarded as one of the best preserved mine complexes in the Ceredigion ore-field for many decades. Its recent history has seen a marked degradation in the surface remains. This has been caused by a combination of factors, including the former use of the site as an off-road driving course and the removal of spoil as hardcore. However, the processes of natural erosion and decay have impacted on many of the standing structures at the mine, including those that have been "protected" by SAM status for many years. This has resulted in the loss of the old chimney stack of the pumping engine house that was once a prominent local landmark. The present use of the northern section of the mine as a large, working saw mill complicates the management of the site as the buildings of the sawmill operation are intermixed with some of the old mine structures and large woodchip waste tips are obscuring some parts of the mine (although these are unlikely to be causing damage to sub-surface features). Even so, Frongoch is still very much an unmistakable industrial complex and a significant landscape feature. (Reference should also be made to the adjacent Wemyss Mine (5.19 below) which was an integral part of the Frongoch complex in the late 19th century and where some of the best preserved features now survive.) The ruined structures of a number of buildings are still present at Frongoch, including the remains of two engine houses, a crusher house, a pumping house and an office building, which fall within an area that already has SAM status. Other fragmentary structures are to be seen across much of the northern part of the mine area, which undoubtedly still offers considerable potential for the survival of sub-surface archaeological remains, despite the loss of much surface evidence. There are also features outside the main mine area, such as two ruined magazines on Banc Lletty Synod to the south and footings the former miners' barracks adjacent to Frongoch cottage to the north. The southern half of the complex was occupied in the main by extensive spoil tips and a large reservoir that supplied water to the ore-processing works at the Wemyss mine, to which it was connected by a leat that survives in good condition for much of its course. The area of spoil tips has been greatly disturbed during the 20th century and the reservoir has long been drained and its site is now barely identifiable. RPS 2002

The First World War necessitated the exploitation for zinc ore, which had previously been a waste material in the more profitable quest for lead. Waste tips were worked over to recover the zinc ore and in 1916 5157 tons of dressed lead and zinc ores were recovered from Welsh mines which included amongst others, the Cwmystwyth and Lisburne group in Ceredigion (Nicholson 1919 p115).

SOURCES -

Bick, DE 1996 Frongoch Lead and Zinc Mine

Nicholson I and Lloyd Williams 1919. Wales its part in the War

PRN - 16246

NAME - ROYAL ORDNANCE FACTORY PEMBREY **TYPE** - Factory/ MUNITIONS FACTORY **PERIOD** - Post-Medieval/ MODERN

EVIDENCE - Building **CONDITION** - Not Known/ DAMAGED

NGR - SN41000040 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The Royal Ordnance Factory Pembrey was constructed on the site of the earlier HM Factory Pembrey built in the First World War (PRN 106519). Construction started in 1938. The extent of the factory was 500 acres, some 250 acres less than the earlier factory. Pembrey was one of four factories manufacturing the high explosive TNT, and it also produced the propellant cordite. Production began in December 1939 and at its highest production employed 3000 people. After the war it also produced ammonium nitrate, an agricultural fertilizer and also decommissioned munitions. On the 12th July 1940 a German plane bombed the factory and 11 people were killed and 15 wounded. Although much of the factory was cleared when the site was restored to become

Pembrey Country Park, there are a number of buildings and structures which survive. A Pyper 2016 based on Hay, The Story of the Royal Ordnance Factories 1939-48.

SOURCES - Page, N 1998 Coastal Survey 1997-98. Carmarthen Bay, Ginst Point to Loughor.
Hay, Ian 1949 ROF - The Story of the Royal Ordnance Factories, 1939-48

SOURCE 2 Llanelli Borough Council The history of the Pembrey Royal Ordnance Factory GP's, DRF
OS 1908 6" Carm LVII NE
OS 1971 SN40SW
The Observer 1992 Deadly secrets buried at beauty spot - scientist DRF
Wales on Sunday 1995 A bomb workers deathbed confession DRF

PRN - 22535

NAME - BRECHFA;Y GWAITH **TYPE** - Chemical Works **PERIOD** - Post-Medieval

EVIDENCE - Documentary Evidence **CONDITION** - Not Known/ NEAR DESTROYED

NGR - SN52333040 **COMMUNITY** - Llanfihangel Rhos-y-Corn

HER DESCRIPTION -

A wood chemical works operating on local timber producing charcoal and other products from 1844 to 1923. The wood was put in ovens to create charcoal and other by-products including acetate of lime which was a vital ingredient for making cordite paste in munitions production. It is recorded in local papers that the Brechfa plant was undertaking contracts for war work and that the company in operation at the time was the Anglo-French Nickel Company. A Pyper 2016 based on various sources.

Built 1843-46 it slowly declined after the First World War and finally stopped working in 1923. JH based on Davies B. 1927 Advertised as for sale by Auction in 1903 it is listed as, "including the two Fields held therewith, together with the very large and commodious Dwelling-house, Stable for 4 Horses. Cowsheds, Yard, Garden, and Premises adjoining, called "TYMAWR all situate in or near the Village of Brechfa, in the County of Carmarthen, on the main road from Brechfa to Carmarthen, and distant about seven miles from Nantgaredig Railway Station of the London and North Western Railway. The Works are sold as a going concern, and in good working order and repair, and comprise 7 ovens to carbonize 170 to 180 tons per month, 7 cooling charcoal boxes, 3 large evaporating lime salting pans, 1 Cornish boiler, 22in. by inn., to work at 45 S.P 1 large tar boiler and stills for acid, 7 copper stills for manufacture of wood spirits, 2 large sumps and 2 large vats for wood acid, copper condensing tubes in casks, a water wheel, and saw bench, all complete; also an office and cart weighbridge, and an extensive yard" The Carmarthen Journal and South Wales Weekly Advertiser 17th July 1903

SOURCES - Linnard, W 2000 Welsh Woods and Forests, A History
The Carmarthen Journal 1916
The Carmarthen Journal 1903 Brechfa Chemical Works
Jones, Gareth 1933 Home of a Former Welsh Oil Industry. When Oaks Were Brought to Brechfa Works.
Cocroft, Wayne D 2000 Dangerous Energy, The archaeology of gunpowder and military explosives manufacture

SOURCE 2 Davies, B 1927 Diwydiannau Coll Ardal Brechfa (Lost Industries of Brechfa) Cymru Vol LXXII DRF
OS 1907 6" Carm XXIV SE

PRN - 22585

NAME - CAMBRIAN MILLS **TYPE** - Woollen Mill **PERIOD** - Post-Medieval

EVIDENCE - Documentary Evidence **CONDITION** - Not Known

NGR - SN35513909 **COMMUNITY** - Llangeler

HER DESCRIPTION -

The Cambrian Mills woollen mill was built on the site of a former small water-powered weaving workshop in 1902. The new mill was to supply the need for woollen cloth for working men in the coal and steel industries. In 1915, a hundred people were employed and flannel was produced for military uniforms for WWI. In 1919, fire broke out in the carding and spinning department and the damage caused was estimated at twenty thousand pounds. A Pyper based on Ludlow and Page 2001.

SOURCES - Ludlow,N Wilson,H & Page,N 2001 42560 Cambrian Mills Dre-Fach Felindre Structural Survey Report.pdf

SOURCE 2 1995 Leaflet for Welsh woollen trail SMR

DAT 2001 The Cambrian Mills, Dre-Fach Felindre Structural Survey Report, 4 parts PRN 42560

DAT 2003 Archaeological Recording of the Graffiti PRN 47391

OS 1906 6" Carm XIII NE

Page,N 2002 Museum of the Welsh Woollen Industry Archaeological Evaluation of the Gas Plant

ACA Reports PRN 44486

Tivy-side Guardian 2001 'Flagship tourist project' DRF

PRN - 25931

NAME - GLOGFACH;GLOGFAWR(ERROR);LISBURNE;PEN GLOG **FTYPE -** Lead Mine **PERIOD -** Post-Medieval

EVIDENCE - Earthwork **CONDITION -** Not Known

NGR - SN35513909 **COMMUNITY -** Llangelier

HER DESCRIPTION -

The Glog Fach & Glog Fawr mine sites are best considered jointly as they were worked in close conjunction and shared much of their surface infrastructure - a not uncommon arrangement for metal mines working adjacent lodes or the same lode, especially when in common ownership as these mines were.

The geological setting of the mines is admirably clear for the lines of shafts and openworks along the economically viable lengths of the mineral lodes result in them being readily discernable across half a mile of upland pasture.

The workings fall into two periods: classic nineteenth century water-powered shafts and dressing floors, and one of the most significant early twentieth century reworkings in the area.

Nineteenth century:

The engine houses for water-powered winding drums and crushing machines are relatively well preserved and bear comparison with the best remains in the remainder of the Cambrian Mountains. Some of the associated waterwheel pits are mostly infilled but their outlines remain readily discernable, permitting the mechanical arrangements to be discerned as readily as at any of the best preserved metal mines in Wales. The sinuous courses of the leats that supplied water to the waterwheels can be easily traced and a large storage reservoir (a natural lake heightened by low dams) remains in water. The routes of the pumping rods, and of some of the winding ropes between the engine houses and waterwheel pits and the shafts they served are particularly well preserved, enabling ready appreciation of how motive power was transmitted considerable distances, a feature common to a great many metal mines in Wales. The courses of tramways from shafts to the dressing floors are clear and generally well preserved. Although the dressing floors have been partly demolished, the outlines of most of the structures shown on historic large scale maps can be discerned, suggesting by analogy with other mine sites that demolition was perfunctory and that immediately below the present ground surface there exists considerable remains of masonry and wooden structures. Around the fringes of the demolition zone rather more upstanding remains of the dressing arrangements can be seen, including two sets of ore bins (that at Glog Fach typically of masonry, the other at Glog Fawr much more unusually rock-cut), and areas of stone pitching / cobbles for preliminary hand-breaking of ore that may date to an early phase of these mines' exploitation. Of the shafts, only the Glog Fawr Engine Shaft retains its masonry collar; the outlines of its associated angle and balance bob pits although infilled can

clearly be seen. On the slopes to the east are enormous tips that are as extensive as any in the Central Wales orefield and bear eloquent testimony to the magnitude of the underground workings. To the north east can be seen the impressive quarter mile long finger tip associated with an optimistic but unsuccessful trial shaft located on an extensive boggy plateau, showing the lengths to which mining companies went to pursue mineral lodes laterally.

Twentieth Century:

Reworking was confined to the central section of the Glog Fawr lode where a major new shaft (probably the second deepest shaft of this period in the area), the Davey Shaft, was sunk. The undisturbed development rock tip to the north east is of classic finger-tip form and the remains of the wooden headgear and concrete loadings for the winding engine are adjacent. The course of the tramway to the new dressing plant built a little to the southwest is very clear. The dressing plant shows an interesting transition in construction techniques, from masonry in its earlier portions, to mass concrete in its later portions. The locations of much of the individual items of plant can be discerned, confirming that it was of relatively traditional form and substantially dependent on nineteenth century technology. An adjoining leat of nineteenth century form supplied a high pressure pipeline whose remains still descend the precipitous hillside to the east to the site of a turbine that provided electrical power to the mine in this last period of activity.

These twentieth century remains provide amongst the clearest examples for typical plant and technologies of this period which comprised the swan-song of the mid Wales orefield (R. Protheroe-Jones June 2012).

The First World War necessitated the exploitation for zinc ore, which had previously been a waste material in the more profitable quest for lead. Waste tips were worked over to recover the zinc ore and in 1916 5157 tons of dressed lead and zinc ores were recovered from Welsh mines which included amongst others, the Cwmystwyth and Lisburne group in Ceredigion (Nicholson 1919 p115).

SOURCES –

Bick, DE 1996 Frongoch Lead and Zinc Mine

Nicholson I and Lloyd Williams 1919. Wales its part in the War

PRN - 30708

NAME - SOUTH WALES IRON AND TINPLATE WORKS; SOUTH WALES STEEL AND TINPLATE WORKS **TYPE -** Tinplate Works **PERIOD -** Post-Medieval

EVIDENCE - Documentary Evidence **CONDITION -** Not Known

NGR - SS50829858 **COMMUNITY -** Llanelli

HER DESCRIPTION -

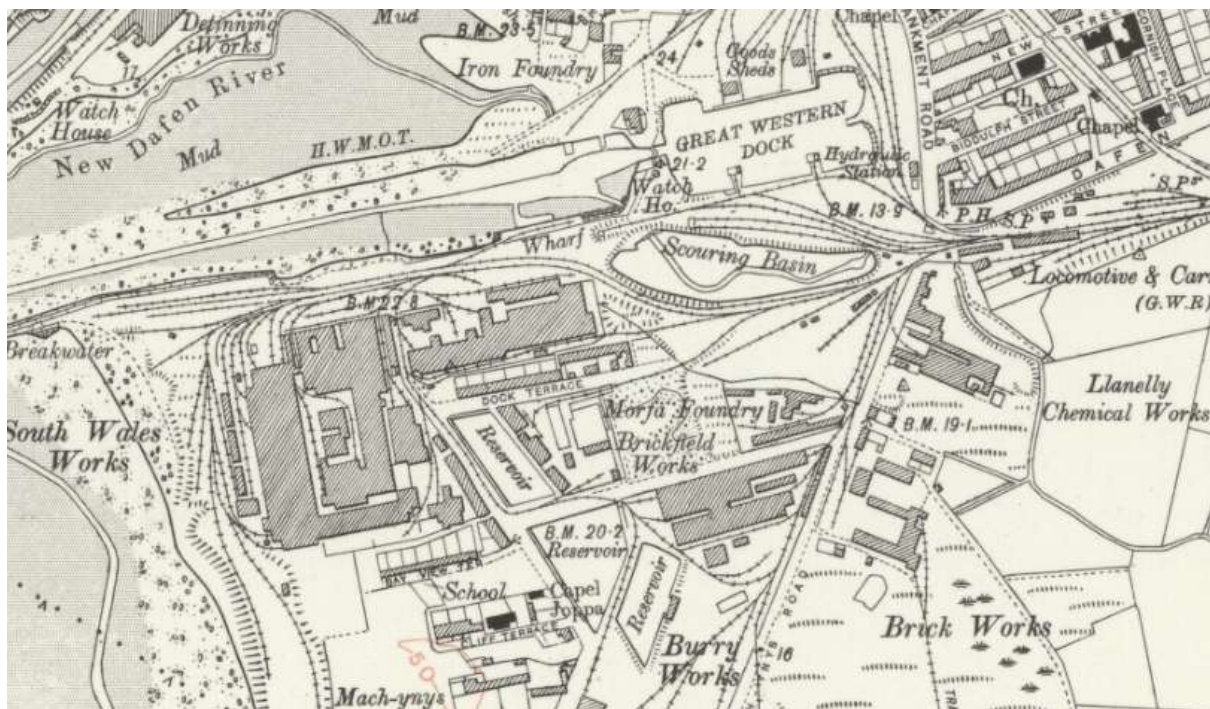
During the First World War the tinplate industry was a less essential industry and steel production increased to meet military needs. The South Wales Steel Works was extended in 1917-18 with its output nearly doubling to 150,000 tons a year. Government supported wartime extensions saw the provision of a new melting shop which produced basic steel as opposed to acid steel produced in the early melting shop. The extent of the works is depicted on the third and fourth edition OS maps (published 1916 and 1952 respectively). The factory closed in 1958 and the site levelled. A Pyper 2016 based on 'The Industrial and Maritime History of Llanelli and Burry Port 1750-2000'. Opened in 1872. Became the first integrated steel and tinplate works in Llanelli in 1879. Closed 1958. P.Sambrook, 1995.

SOURCES - Craig RS., Protheroe Jones R., Symons MV., 2002 The Industrial and Maritime History of Llanelli and Burry Port 1750 to 2000

Ordnance Survey 1952 Carmarthenshire LVIII.SE

Ordnance Survey pub 1916 Third edition 1:2500

SOURCE 2 Hughes,S & Reynolds,P 1992 A guide to the Industrial Archaeology of the Swansea Region, p.21



Ordnance Survey Carmarthenshire LVIII.SE, revised 1913, published 1921.



Ordnance Survey Carmarthenshire LVIII.SE, revised 1938, published 1948.

PRN - 31343

NAME - HMF PEMBREY **TYPE** - Railway Siding **PERIOD** - Modern

EVIDENCE - Earthwork **CONDITION** - Not Known

NGR - SN40930139 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Railway sidings which relate to the movement of materials and workers around the HM Pembrey factory during the First World War. A Pyper 2016 Farmland. Ap's 1992 (120, 121). Siding on disused tramway (PRN 31362). On aerial photographs taken in 1992 there were two buildings clearly shown, these are almost certainly modern farm buildings and not associated with the workings of the tramway. NP

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2 Page, N & Allen, B 1996 Kidwelly and Pembrey Marshes

PRN - 31362

NAME - HMF PEMBREY **TYPE** - Tramway/ RAILWAY **PERIOD** - Post-Medieval/ MODERN

EVIDENCE - Earthwork **CONDITION** - Not Known

NGR - SN40750120 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

A raised flat-topped causeway which curves NE away from a point near to the main railway line suggesting that it may once have been a branch line or tramway associated with the railway. From the railway it curves into Pen-Y-Bedd Wood before running W across the flat pasture land between Pen-Y-Bedd and Pembrey Forest. At one point the line widens into what looks from aerial photographs to be a siding (PRN 31343), from here it curves S and enters the NE corner of the Royal Ordnance Factory site. NAP 1996

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2 Page, N & Allen, B 1996 Kidwelly and Pembrey Marshes

PRN - 31371

NAME - ROF PEMBREY **TYPE** - Observation Post **PERIOD** - Modern

EVIDENCE - Building **CONDITION** - Intact

NGR - SN40170062 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Brick-built observation post with concrete observation slits on each wall. Flat concrete roof approximately 2m square. Accessed by a protected entrance on the south corner. A Pyper 2014 Brick built, writing on west wall: <- S.W. Entrance on SE corner. Constructed on a flattened and made up dune next to building PRN 31372. More likely to be a firewatchers post than a pill box. This is perhaps confirmed by the S & W written on the west wall to ensure accurate directions are given by the watchers.

SOURCES - Pyper, A 2013 Twentieth century military sites: Airfields - dispersed sites and defences

SOURCE 2 Page,N & Allen,B 1996 Kidwelly and Pembrey Marshes

PRN - 31373

NAME - HMF PEMBREY **TYPE** - Tramway **PERIOD** - Post-Medieval/ Modern

EVIDENCE - Structure **CONDITION** - Near Intact

NGR - SN40000070 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

A visible section of narrow gauge track relating to the Cordite Packing and Blending houses from the First World War factory, shown on the c1917 plan.

SOURCES - 1958 R.O.F Pembrey Layout of Factory
c1917 HMF Pembrey Block plan of plant

SOURCE 2 Page,N & Allen,B 1996 Kidwelly and Pembrey Marshes

PRN - 31374

NAME - HMF PEMBREY **TYPE** - Building Platform **PERIOD** - Modern

EVIDENCE - Building **CONDITION** - Destroyed

NGR - SN39930066 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The traces of a building survive as a concrete platform. This building is shown on the c1917 and 1958 plan and may represent a building which was used in both factories. A Pyper 2015
The suspected site of a building. Nothing visible anymore except a small fragment of reinforced concrete and a hollow in the ground. ; This site is associated with 20th century development and is not an antiquity. PR 2003 based on RPS 2003

SOURCES - 1958 R.O.F Pembrey Layout of Factory
c1917 HMF Pembrey Block plan of plant

SOURCE 2 Page,N & Allen,B 1996 Kidwelly and Pembrey Marshes
Sambrook,RP 2004 Deserted Rural Settlements in Southwest Wales 2003-4 Project ACA reports
2004-17

PRN - 31375

NAME - ROF PEMBREY **TYPE** - Observation Post **PERIOD** - Modern

EVIDENCE - Building **CONDITION** - Intact/ Near Intact

NGR - SN39700062 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Brick-built rectangular building with flat concrete roof. Protected entrance, though part of the blast wall has been lost. A characteristic lookout found on ROF factory sites. A Pyper 2014
Blast protection wall over entrance. NP 1995

SOURCES - Pyper, A 2013 Twentieth century military sites: Airfields - dispersed sites and defences

SOURCE 2 Page,N & Allen,B 1996 Kidwelly and Pembrey Marshes

PRN - 31377

NAME - HMF PEMBREY **TYPE** - Building **PERIOD** - Modern

EVIDENCE - Building **CONDITION** - Near Destroyed

NGR - SN40460098 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Identified in a previous survey, the remains of a small red brick-built structure including a concrete base and a small section of one wall survives (to a height of 0.4m) intact. This lies within the area of the acetone recovery plant in HMF Pembrey during the First World War. A Pyper 2015 the remains of a small red brick-built structure in the N of Pembrey Country Park. Only a concrete base and a small section of one wall survives (to a height of 0.4m) intact.

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2 Page,N & Allen,B 1996 Kidwelly and Pembrey Marshes

PRN - 31378

NAME - HMF PEMBREY **TYPE** - Unknown **PERIOD** - Modern

EVIDENCE - Building **CONDITION** - Near Destroyed

NGR - SN40540102 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Identified in a previous survey, the remains of a small red brick-built structure lies within the area of the acetone recovery plant in HMF Pembrey during the First World War. A Pyper 2015 Red-brick, short length of wall.

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2 Page,N & Allen,B 1996 Kidwelly and Pembrey Marshes

PRN - 31397

NAME - HMF PEMBREY **TYPE** - Bunker/ EXPLOSIVES MANUFACTURING SITE **PERIOD** - Modern

EVIDENCE - Building **CONDITION** - Intact

NGR - SN40160126 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Complex of bunkers in Pembrey Forest. There are at least five bunkers of similar construction. Each one has a high almost circular sand bank entered from one side by a wide red brick-built tunnel with a concrete roof. Opposite is a narrower entrance, presumably for pedestrians, both entrances are curved. These are the remains of the Guncotton production area which was producing Cordite in the HM Factory Pembrey during the First World War.

SOURCES - DAT 2010 31397.pdf
c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 31400

NAME - HMF PEMBREY **TYPE** - Unknown/ EXPLOSIVES MANUFACTURING SITE **PERIOD** - Modern

EVIDENCE - Earthwork **CONDITION** - Near Destroyed

NGR - SN40390120 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

A long rectangular building within an earth bank identified in the previous survey is located within an area of ballistite production shown on the HMF Pembrey plan. A Pyper 2015
Long rectangular building, protected by horseshoe shaped sand bank.

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 31401

NAME - HMF PEMBREY **TYPE** - Building/ EXPLOSIVES MANUFACTURING SITE **PERIOD** - MODERN

EVIDENCE - Building **CONDITION** - Near Destroyed

NGR - SN40340122 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

A structure identified in the previous survey is located within an area of ballistite production shown on the HMF Pembrey plan. A Pyper 2015
Staggered entrance. Presumably a building associated with the Pembrey Airfield complex. RPS July 2001

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 31402

NAME - HMF PEMBREY **TYPE** - Pit **PERIOD** - Modern

EVIDENCE - Structure **CONDITION** - Intact

NGR - SN40300120 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

A brick built pit identified in the previous survey is located within an area of ballistite production shown on the HMF Pembrey plan. A Pyper 2015
Brick-built pit
javascript:geoFormOkClick('formDivcore')

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 31403

NAME - HMF PEMBREY **TYPE** - Structure/ EXPLOSIVES MANUFACTURING SITE **PERIOD** - Modern

EVIDENCE - Earthwork **CONDITION** - Near Intact

NGR - SN40320123 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Area of Ballistite production in HMF Pembrey. A brick built tunnel has been recorded in an earlier survey and is presumably part of the earth banked structures with the areas of explosive production as shown on the c1917 plan. A Pyper 2015

Brick-Built Tunnel.

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 31622

NAME - BYNEA STEEL WORKS **TYPE** - Works/ STEEL WORKS **PERIOD** - Modern

EVIDENCE - Building **CONDITION** - Not Known/ NEAR DESTROYED

NGR - SS55859841 **COMMUNITY** - Llanelli Rural

HER DESCRIPTION -

Bynea Steel Works began manufacturing in 1913 and continued until 1951. During the First World War the production of steel was increased to meet military needs and from 1916 the works manufactured steel for shells. At this time Bynea Steel Works were successful in the manufacture of high grade steel in basic open hearth furnaces a change which was reflected across the steel industry as producers switched from smelting imported haematite ores to smelting home produced phosphoric ores. Ordnance Survey map evidence from the third edition (pub 1916) and fourth edition (pub 1935) show an extensive factory served by railways from the northwest. Modern aerial photographs (2009) show the land reclaimed to scrub and vegetation, no trace of upstanding structures survive. A Pyper 2016 based on various sources. Substantial works identified from aerial photographs. Associated features include quay 31610 and sidings 31623. BDA 1997

SOURCES - Next Perspectives 2009 Digital aerial photo mapping

Craig RS., Protheroe Jones R., Symons MV., 2002 The Industrial and Maritime History of Llanelli and Burry Port 1750 to 2000

Nicholson I & Lloyd-Williams T 1919 Wales: its part in the War

Ordnance Survey pub 1916 Third edition 1:2500

Ordnance Survey pub 1935 Fourth edition Six inch

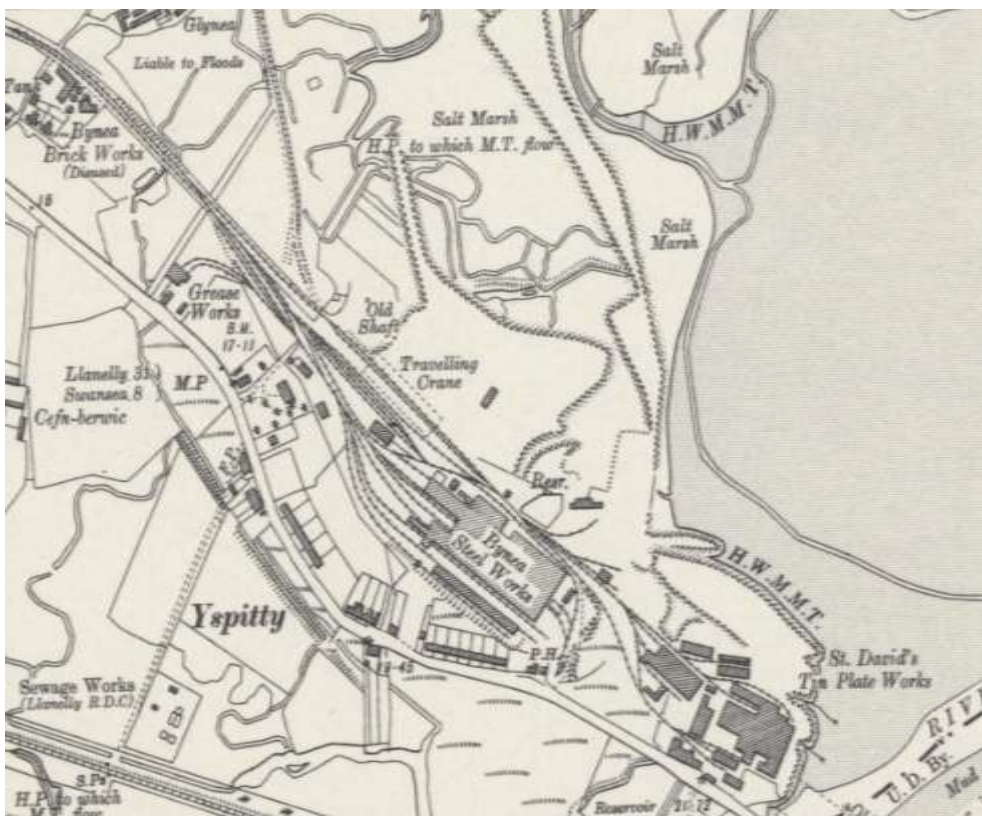
SOURCE 2 1981 Meridian 0681 (32,33)

Hall, J & Sambrook, P 2003 Bynea Heritage Audit SMR Library

Page, NA & Allen, BD 1996 & 1997 Llanelli Wetlands Survey 1996 & 1997 SMR Library



Ordnance Survey Carmarthenshire LIX.SW, revised 1913, published 1921.



Ordnance Survey Carmarthenshire LIX.SW, revised 1935, published 1942.

PRN - 61238

NAME - WEAVING SHED AT MUSEUM OF WELSH WOOLLEN INDUSTRY **TYPE** - Weaving Shed/

WEAVERS WORKSHOP **PERIOD** - Post-Medieval/ MODERN

EVIDENCE - Building **CONDITION** - Not Known

NGR - SN3547039087 **COMMUNITY** - Llangelier

HER DESCRIPTION -

Grade II listed weaving shed The First World War had an impact on the woollen industry with government contracts to provide cloth for military uniforms and blankets. Consequently new machinery was purchased, extensions to current buildings and new buildings were constructed and this can be seen at Cambrian Mills in particular it is thought that the weaving shed was built in 1915 to allow greater capacity of operation and an internal reordering. A Pyper 2016 pers comm National Woollen Museum and Page and Ludlow 2001.

SOURCES - Ludlow,N Wilson,H & Page,N 2001 42560 Cambrian Mills Dre-Fach Felindre Structural Survey Report.pdf

SOURCE 2

PRN - 103997

NAME - LLANELLY STEEL WORKS **TYPE** - Steel Works **PERIOD** - POST MEDIEVAL/ MODERN

EVIDENCE - Documentary Evidence **CONDITION** - NEAR DESTROYED/ DAMAGED

NGR - SN49550024 **COMMUNITY** - Llanelli

HER DESCRIPTION -

Large complex of buildings served by railways shown on the OS third and fourth edition (1921, 1953) shown as Llanelly Steel Works. Said to be part of the western group committee established in 1915 to address the war effort.

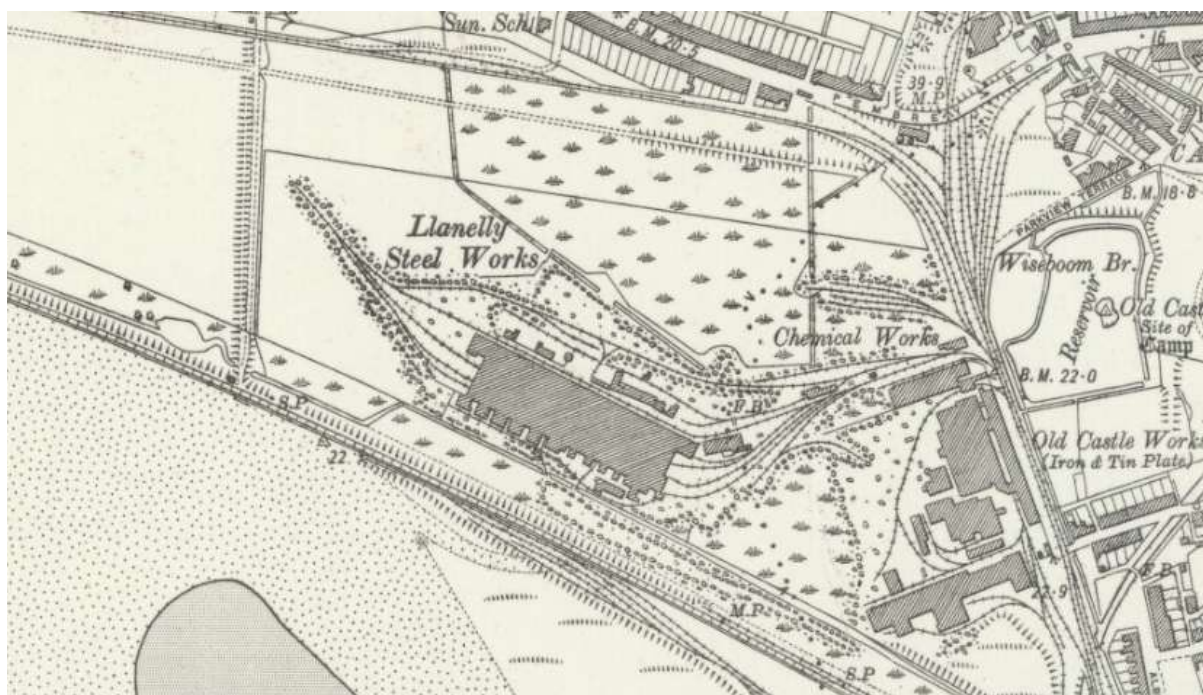
Map evidence suggests that the factory has been cleared and reclaimed.

A Pyper based on various sources.

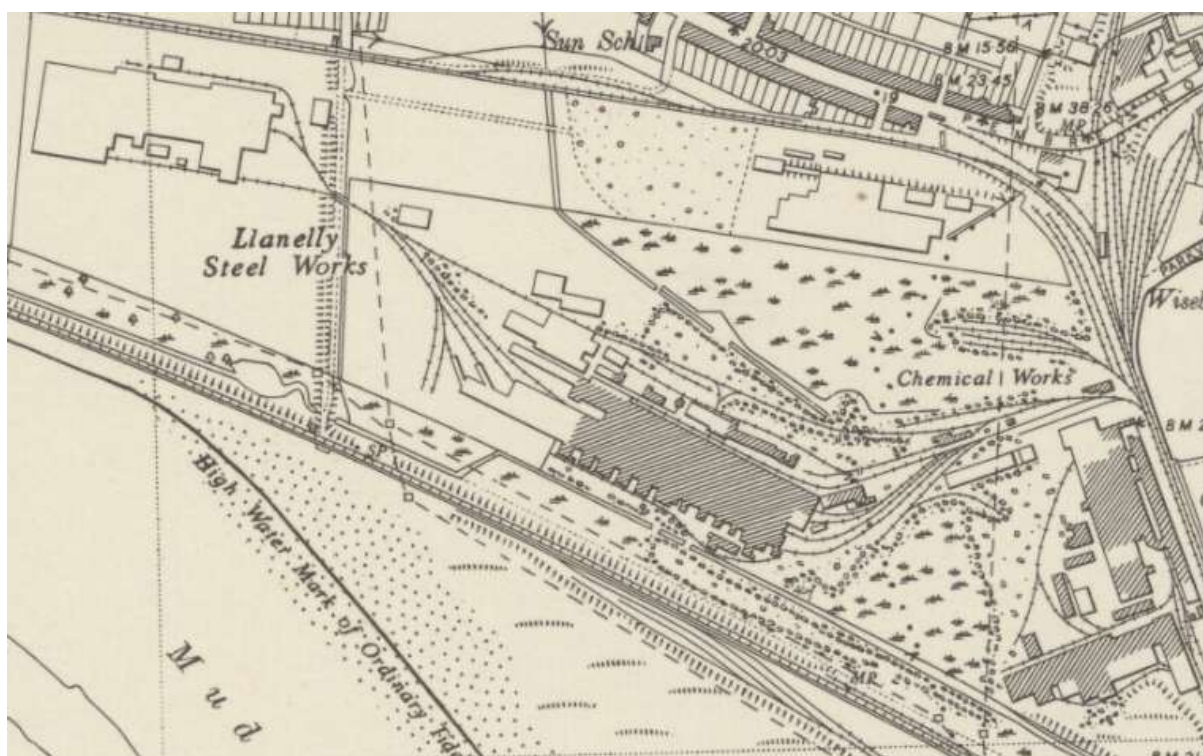
SOURCES -

Nicholson I & Lloyd-Williams T 1919 Wales: its part in the War
Ordnance Survey Carmarthenshire LVIII.NW pub 1921
Ordnance Survey Carmarthenshire LVIII.NW pub 1953 Fouth edition Six inch

SOURCE 2



Ordnance Survey Carmarthenshire LVIII.NW revised 1913, pub 1921.



Ordnance Survey Carmarthenshire LVIII.NW revised 1948, pub 1953.

PRN - 106519

NAME - HM FACTORY PEMBREY; NOBELS EXPLOSIVES FACTORY **TYPE** - Explosives Factory/
MUNITIONS FACTORY **PERIOD** - POST MEDIEVAL/ MODERN

EVIDENCE - Documentary Evidence **CONDITION** - NEAR DESTROYED/ DAMAGED

NGR - SN40500050 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

In 1914 Nobels Explosives Company Ltd agreed with the Secretary of State for War to build and manage a factory at Pembrey to manufacture TNT and high explosives. This was on the site of the earlier Pembrey dynamite factory (PRN 9039) and where Nobels had already intended to set up works for making industrial explosives. The firm also agreed to manufacture propellant explosives for the Admiralty and in October 1915 the two agreements were amalgamated and transferred to the Ministry of Munitions. The factory covered an area of approximately 760 acres and comprised over 400 working buildings for the production of TNT tetryl, cordite and ballistite. It was served by two railway spurs branching from the Great Western Railway Paddington to Fishguard mainline which passed within threequarters of a mile from the factory. The manufacture of TNT began in 1915 and subsequent developments allowed the production of propellants; rifle cordite, ordnance cordite and ballistite. The factory was entirely self contained for water, electricity and power. Labour came from all over the region, but special trains were laid on to bring in workers from Carmarthen, Llanelly and Swansea, with the majority being women. Following the end of the First World War the factory closed and it was eventually sold in 1926. A separate factory on the site was built for filling shells (PRN 109252). Although much of the site was dismantled during the construction of the Royal Ordnance Factory Pembrey in 1938-9, some of the earthworks, particularly those built as blast banks around the danger buildings where explosives were made, still survive together with sections of narrow gauge railway which provided transportation of materials around the site. A Pyper, based on block plan (c1917) and Official History of Munitions (1922).

Site of Nobel Dynamite factory. Part of a site used as WW1 and WW2 munitions factory. Site extends over 200 hectares with some railway and some buildings extant.

SOURCES - c1917 HMF Pembrey Block plan of plant
HMSO 1922 repub The Official History of The Ministry of Munitions Volume VIII

SOURCE 2

PRN - 107840

NAME - Magazine M1 ROF PEMBREY **TYPE -** MAGAZINE **PERIOD -** MODERN

EVIDENCE - EARTHWORK **CONDITION -** NEAR DESTROYED

NGR - SS4098899818 **COMMUNITY -** Cefn Sidan

HER DESCRIPTION -

The site of a magazine, recorded and shown as M1 on the ROF plan dated 1958. One of ten magazines shown on the plan, this one has not survived as well as the others and has largely been demolished and the ground reinstated. Only a grassy mound survives. Knowing the extent and depth of the construction of these features there may well be below ground remains surviving. A Pyper 2016

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107841

NAME - Magazine M2 ROF PEMBREY **TYPE -** MAGAZINE **PERIOD -** MODERN

EVIDENCE - EXTANT STRUCTURE **CONDITION -** NEAR INTACT

NGR - SS4082999784 **COMMUNITY -**

HER DESCRIPTION -

The site of a magazine, recorded and shown as M2 on the ROF plan dated 1958. One of ten magazines shown on the plan, this survives as an earth & turf covered mound, within which is a reinforced concrete magazine consisting of 3 store rooms and 2 subsidiary rooms and large

ventilation spaces. The entrances at either end are currently shuttered up. AD Coombe and A Pyper 2016

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107842

NAME - Magazine M3 ROF PEMBREY **TYPE** - MAGAZINE **PERIOD** - MODERN

EVIDENCE - EARTHWORK **CONDITION** - DAMAGED

NGR - SS4089299931 **COMMUNITY** -

HER DESCRIPTION -

The site of a magazine, recorded and shown as M3 on the ROF plan dated 1958. One of ten magazines shown on the plan, this survives as an earth & turf covered mound, but the entrances to the magazine are earth filled and no access to the magazine is possible. AD Coombe and A Pyper 2016

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107843

NAME - Magazine M4 ROF PEMBREY **TYPE** - MAGAZINE **PERIOD** - MODERN

EVIDENCE - EXTANT STRUCTURE **CONDITION** - NEAR INTACT

NGR - SS4070599932 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The site of a magazine, recorded and shown as M4 on the ROF plan dated 1958. One of ten magazines shown on the plan, this survives as an earth & turf covered mound, within which is a reinforced concrete magazine consisting of 3 store rooms and 2 subsidiary rooms and large ventilation spaces. Loading access is provided by a standard gauge railway and platform within the structure. The entrances at either end are currently open. AD Coombe and A Pyper 2016

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107844

NAME - Magazine M5 ROF PEMBREY **TYPE** - MAGAZINE **PERIOD** - MODERN

EVIDENCE - EXTANT STRUCTURE **CONDITION** - INTACT

NGR - SN4081600021 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The site of a magazine, recorded and shown as M5 on the ROF plan dated 1958. One of ten magazines shown on the plan, this survives as an earth & turf covered mound, within which is a reinforced concrete magazine consisting of 3 store rooms and 2 subsidiary rooms and large ventilation spaces. Loading access is provided by a standard gauge railway and platform within the structure. The entrances at either end are currently open. AD Coombe and A Pyper 2016

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107845

NAME - Magazine M6 ROF PEMBREY **TYPE** - MAGAZINE **PERIOD** - MODERN

EVIDENCE - EXTANT STRUCTURE **CONDITION** - INTACT

NGR - SN4061700025 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The site of a magazine, recorded and shown as M6 on the ROF plan dated 1958. One of ten magazines shown on the plan, this survives as an earth & turf covered mound, within which is a reinforced concrete magazine consisting of 3 store rooms and 2 subsidiary rooms and large ventilation spaces. Loading access is provided by a standard gauge railway and platform within the structure, the buffer ends of the railway track survive. The entrances at either end are currently open. AD Coombe and A Pyper 2016

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107846

NAME - Magazine M7 ROF PEMBREY **TYPE** - MAGAZINE **PERIOD** - MODERN

EVIDENCE - EXTANT STRUCTURE **CONDITION** - INTACT

NGR - SN4073500105 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The site of a magazine, recorded and shown as M7 on the ROF plan dated 1958. One of ten magazines shown on the plan, this survives as an earth & turf covered mound, within which is a reinforced concrete magazine consisting of 3 store rooms and 2 subsidiary rooms and large ventilation spaces. Loading access is provided by a standard gauge railway and platform within the structure, the buffer ends of the railway track survive. The entrances at either end are currently open and at the southern entrance the remains of the electrical fuse box survive. AD Coombe and A Pyper 2016

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107847

NAME - Magazine M8 ROF PEMBREY **TYPE** - MAGAZINE **PERIOD** - MODERN

EVIDENCE - EXTANT STRUCTURE **CONDITION** - INTACT

NGR - SN4053500117 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The site of a magazine, recorded and shown as M8 on the ROF plan dated 1958. One of ten magazines shown on the plan, this survives as an earth, turf, scrubby vegetation and thorn covered mound, within which is a reinforced concrete magazine consisting of 3 store rooms and 2

subsidiary rooms and large ventilation spaces. Loading access is provided by a standard gauge railway and platform within the structure, the buffer ends of the railway track survive but not located at the full end of the magazine. The magazine has been partially blocked off at the northern end. AD Coombe and A Pyper 2016

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107848

NAME - Magazine M9 ROF PEMBREY **TYPE** - MAGAZINE **PERIOD** - MODERN

EVIDENCE - EXTANT STRUCTURE **CONDITION** - INTACT

NGR - SN4065900204 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The site of a magazine, recorded and shown as M9 on the ROF plan dated 1958. One of ten magazines shown on the plan, this survives as an earth, turf and tree covered mound, within which is a reinforced concrete magazine consisting of 3 store rooms and 2 subsidiary rooms and large ventilation spaces. Loading access is provided by a standard gauge railway and platform within the structure. The entrances at either end are currently open. AD Coombe and A Pyper 2016

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107849

NAME - Magazine M10 ROF PEMBREY **TYPE** - MAGAZINE **PERIOD** - MODERN

EVIDENCE - EXTANT STRUCTURE **CONDITION** - INTACT

NGR - SS4057399900 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The site of a magazine, recorded and shown as M2 on the ROF plan dated 1958. One of ten magazines shown on the plan, this survives as an earth & turf covered mound, within which is a reinforced concrete magazine consisting of 3 store rooms and 2 subsidiary rooms and large ventilation spaces. The entrances at either end are currently shuttered up. AD Coombe and A Pyper 2016

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107850

NAME - HMF PEMBREY Nitrator Separator House **TYPE** - EXPLOSIVES MANUFACTURING SITE **PERIOD** - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN4070500485 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

An earth and sand embanked circular enclosure with three brick arched entrance tunnels through the banks leading to the northeast and northwest. The enclosure is shown and labelled on the HM Factory Pembrey of 1917 plan as one of the Nitrator Separator Houses. It is located on a high ridge above the other cordite mixing areas in order to allow gravity to run off nitroglycerine which was too dangerous to pump or carry. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107851

NAME - HMF Pembrey Dry Guncotton magazine **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN40530067 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Dry Guncotton expense magazine. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and a entrance to it was through the curved brick built tunnel. A mortar scar within the tunnel entrance suggests the tunnel may at some point have had a blocking. The enclosure is approximately 20m in diameter (though the enclosure on the plan is subrectangular) and the bank around 3m high and the tunnel 8.25m long. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107852

NAME - HMF Pembrey Dry Guncotton magazine **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN40570062 **COMMUNITY** -

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Dry Guncotton expense magazine. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and a entrance to it was through the curved brick built tunnel. The enclosure is approximately 17m in diameter (though the enclosure on the plan is subrectangular) and the bank around 3m high and the tunnel 8.1m long. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107853

NAME - HMF Pembrey Cordite Paste Mixing house **TYPE** - EXPLOSIVES MANUFACTURING

SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - NOT KNOWN

NGR - SN40600069 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste Mixing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and a entrance to it was through the curved brick built tunnel. The enclosure is approximately 20m in diameter (though the enclosure on the plan is subrectangular) and the bank around 3m high and the tunnel 8.15m long. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107854

NAME - HMF Pembrey Cordite Paste Mixing house **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN40640064 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste Mixing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and a entrance to it was through the curved brick built tunnel which lies on the south side of this enclosure. The enclosure is approximately 20m in diameter (though the enclosure on the plan is subrectangular) and the bank around 3m high and the tunnel c8m long. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107855

NAME - HMF Pembrey Cordite Paste Mixing house **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN40680059 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste Mixing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and a entrance to it was through the curved brick built tunnel which lies on the south side of this enclosure. The enclosure is approximately 15.5m in across NW-SE (the enclosure on the plan is subrectangular) and the bank around 3m high and the tunnel c8 long. A Pyper 2015

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107856

NAME - HMF Pembrey Cordite Paste Mixing house **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - NOT KNOWN

NGR - SN40660070 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste Mixing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and a entrance to it was through the curved brick built tunnel which lies on the south side of this enclosure. The enclosure is approximately 20m in diameter (though the enclosure on the plan is subrectangular) and the bank around 3m high and the tunnel c8m long. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107857

NAME - HMF Pembrey Cordite Paste Mixing house **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN40700065 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste Mixing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and a entrance to it was through the curved brick built tunnel which lies on the south side of this enclosure. The enclosure is sub-rectangular and measures approximately 15m SE-NW and 23 NE-SW and the bank around 3m high and the tunnel c8m long. The tunnel floor is cement with sand, aggregate and coal. The tunnel entrance is partially collapsed and loose bricks are stamped with 'Coedely' and 'C L Q' A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107858

NAME - HMF Pembrey Cordite Paste Expense magazine **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN40690077 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite paste expense magazine. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the curved brick built tunnel. The enclosure is heavily overgrown and access not possible. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107859

NAME - HMF Pembrey Cordite Paste Expense magazine **TYPE** - EXPLOSIVES MANUFACTURING SITE **PERIOD** - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN40730072 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite paste expense magazine. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the curved brick built tunnel. The enclosure is sub-rectangular and measures approximately 15m SE-NW and 23 NE-SW and the bank around 3m high and the tunnel c8m long. The interior of the enclosure is very overgrown. Outside the tunnel entrance is a feature in the turf the possible remains of an outbuilding (PRN 107872). A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107860

NAME - HMF Pembrey Cordite Paste Expense magazine **TYPE** - EXPLOSIVES MANUFACTURING SITE **PERIOD** - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN40730067 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste Mixing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the curved brick built tunnel which lies on the south side of this enclosure. The enclosure is sub-rectangular and approximately 20m in its longest axis and the bank around 3m high and the tunnel c8m long. The interior of the enclosure is very overgrown. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107861

NAME - HMF Pembrey Cordite Paste Expense magazine **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN40820064 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste Mixing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the curved brick built tunnel which lies on the south side of this enclosure. The enclosure is sub-rectangular and approximately 20m in it longest axis and the bank around 3m high and the tunnel c8m long. The interior of the enclosure is very overgrown. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107862

NAME - HMF Pembrey Cordite Paste Expense Magazine **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN40740081 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste expense magazine. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the curved brick built tunnel which lies on the south side of this enclosure. The enclosure is sub-rectangular and approximately 20m in it longest axis and the bank around 3m high and the tunnel c8m long. The interior of the enclosure is very overgrown. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107863

NAME - HMF Pembrey Cordite Paste Expense Magazine **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN40780076 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste Expense magazine. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the curved brick built tunnel which lies on the south side of this enclosure. The enclosure is sub-rectangular and approximately 20m in its longest axis and the bank around 3m high and the tunnel c8m long. The tunnel entrance has been converted into an Air Raid Shelter (PRN 109254), with a brick blocked entrances at either end with ventilation holes above a low entrance way. The splayed tunnel entrances also have a blast wall built partially blocking the way in. Within the tunnel low brick piers are arranged along either wall which would have supported bench seating. Within the enclosure a structure is also identifiable by a brick foundation course running NW-SE, iron bolts project from the brick foundation which would presumably have fixed a wooden superstructure. Artefacts lying within the enclosure include fragments of a rubberized material or lino and a Trimsaran brick. A 'Coedely' brick lies on the exterior of the enclosure. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107864

NAME - HMF PEMBREY Cordite Paste Packing House **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN4026801045 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste packing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the brick tunnel with concrete slab roof which lies to the side of this enclosure. The entrances to the tunnel have been blocked with breeze block. A secondary entrance tunnel lies on the northeast of the enclosure. The enclosure is sub-rectangular, very overgrown on the interior and a full description therefore not possible. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107865

NAME - HMF PEMBREY Cordite Paste Packing House **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN4022801092 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste packing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the brick tunnel with concrete slab roof which lies to the side of this enclosure. The entrances to the tunnel have been blocked

with breeze block. The enclosure is sub-rectangular, very overgrown on the interior and a full description therefore not possible. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107866

NAME - HMF PEMBREY Cordite Paste Packing House **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - NOT KNOWN

NGR - SN4018701142 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste packing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the brick tunnel with concrete slab roof which lies to the side of this enclosure. The entrances to the tunnel have been blocked with breeze block. A secondary entrance tunnel lies on the northeast of the enclosure. The enclosure is sub-rectangular, very overgrown on the interior and a full description therefore not possible. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107867

NAME - HMF PEMBREY Cordite Paste Mixing House **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN4010301151 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste mixing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the brick tunnel with concrete slab roof which lies to the side of this enclosure. The entrances to the tunnel have been blocked with breeze block. A secondary entrance tunnel lies on the opposite side of the enclosure. The enclosure is sub-rectangular, very overgrown on the interior and a full description therefore not possible. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107868

NAME - HMF PEMBREY Cordite Paste Mixing House **TYPE** - EXPLOSIVES MANUFACTURING

SITE PERIOD - MODERN

EVIDENCE - EXTANT STRUCTURE **CONDITION** - DAMAGED

NGR - SN4014401103 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste mixing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the brick tunnel with concrete slab roof which lies to the side of this enclosure. A secondary entrance tunnel lies on the opposite side of the enclosure. The enclosure is sub-rectangular, very overgrown on the interior and a full description therefore not possible. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107869

NAME - HMF PEMBREY Cordite Paste Mixing House **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN4018501056 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste mixing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the brick tunnel with concrete slab roof which lies to the side of this enclosure. A secondary entrance tunnel lies on the opposite side of the enclosure. The enclosure is sub-rectangular, very overgrown on the interior and a full description therefore not possible. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107870

NAME - HMF PEMBREY Cordite Paste Mixing House **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN4022801009 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste mixing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the brick tunnel with concrete slab roof which lies to the side of this enclosure, the tunnel has a concrete floor with the impressions of sleepers within it. A secondary entrance tunnel lies on the opposite side of the

enclosure. The enclosure is sub-rectangular, very overgrown on the interior and a full description therefore not possible. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107871

NAME - ROF PEMBREY **TYPE -** LOOKOUT **PERIOD -** MODERN

EVIDENCE - BUILDING **CONDITION -** NEAR INTACT

NGR - SN4069300801 **COMMUNITY -**

HER DESCRIPTION -

A brick built look out sited on top of an earth bank of a circular enclosure. The structure is typical of a ROF Type pillbox/lookout. These are typically only found at Royal Ordnance depots and factories. It is a small square pillbox with distinctive long narrow embrasures in each wall. . The long narrow embrasure serves well as an observation slit but not as well as a firing port, this suggests the main function of this type was as an observation and guard post with a secondary role of defensive position in the event of an attack. This lookout is situated on the bank of the earlier enclosure bank around a First World War Cordite Paste Expense Magazine (PRN 107858). AD Coombe, S Rees 2015

SOURCES -

SOURCE 2

PRN - 107872

NAME - HMF PEMBREY **TYPE -** STRUCTURE **PERIOD -** MODERN

EVIDENCE - STRUCTURE **CONDITION -** NEAR DESTROYED

NGR - SN4073600711 **COMMUNITY -** Cefn Sidan

HER DESCRIPTION -

Foundation course of a brick structure visible in path beside Dry Guncotton magazine (PRN 107852). The structure is square and 135cm long on one side that is fully visible. A Pyper 2015

SOURCES -

SOURCE 2

PRN - 107873

NAME - HMF PEMBREY **TYPE -** PIT **PERIOD -** MODERN

EVIDENCE - STRUCTURE **CONDITION -** NOT KNOWN

NGR - SN4028001444 **COMMUNITY -** Cefn Sidan

HER DESCRIPTION -

A rectangular sunken brick structure approximately 90cm deep and consisting of two parallel pits orientated NE-SW. They are on the same axis as the railway and platform (PRN 107875). The area is currently under brash from forestry thinning so the full extent of the structures is hard to evaluate. On the 1917 plan there are a number of structures identified in this area which range

from Laboratory (Cordite Paste) Mess Room, Temp Boiler House and Cooling plant. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107874

NAME - HMF PEMBREY **TYPE** - PIT **PERIOD** - MODERN

EVIDENCE - STRUCTURE **CONDITION** - NOT KNOWN

NGR - SN4028801452 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

A rectangular sunken brick structure approximately 152cm deep and 115x185cm. Three metal U-shaped staples provide steps into the pit. The area is currently under brash from forestry thinning so the full extent of the structures is hard to evaluate. On the 1917 plan there are a number of structures identified in this area which range from Laboratory (Cordite Paste) Mess Room, Temp Boiler House and Cooling plant. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107875

NAME - HMF PEMBREY **TYPE** - RAILWAY PLATFORM **PERIOD** - MODERN

EVIDENCE - STRUCTURE **CONDITION** - NEAR INTACT

NGR - SN4029801464 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Railway platform, capped with blue coping bricks, at least 1metre high. The full extent of the platform is hard to evaluate as there is a great deal of brush and vegetation. The 1917 plan of HM Factory Pembrey shows the railway coming to the platform from the northeast and the platform arranged on this axis. A Pyper 2015

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107876

NAME - HMF PEMBREY **TYPE** - RAILWAY PLATFORM **PERIOD** - MODERN

EVIDENCE - STRUCTURE **CONDITION** - NEAR INTACT

NGR - SN4015401212 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Concrete railway platform 30cm high and c 5m deep survives on the side of a former railway bed, now a path. On the 1917 plan of HMF Pembrey this is shown lying between a 'Nitroglycerine Washing House' to the east and a 'Wash Water Settling House'. A Pyper 2015

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107877

NAME - HMF PEMBREY **TYPE** - RAILWAY **PERIOD** - MODERN

EVIDENCE - EARTHWORK **CONDITION** - DAMAGED

NGR - SN4015701141 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Section of narrow gauge railway serving the cordite production areas, shown on the 1917 plan of HMF Pembrey. Now used as a footpath with sections of rail still surviving in places. A Pyper 2105

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107878

NAME - ROF PEMBREY **TYPE** - LOOKOUT **PERIOD** - MODERN

EVIDENCE - BUILDING **CONDITION** - DAMAGED

NGR - SN3991100280 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Brick built lookout, characteristically a ROF design lookout, although this one has narrow embrasures. Its position doesn't quite tie into a lookout shown on the ROF plan, thought it is clearly of the right date. A Pyper 2015

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107879

NAME - ROF PEMBREY **TYPE** - EXPLOSIVES MANUFACTURING SITE **PERIOD** - MODERN

EVIDENCE - EARTHWORK **CONDITION** - DAMAGED

NGR - SN4060901094 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

A large earthen mound roughly 50m across, which appears to be a magazine though no entrances are accessible and the mound is well grown over with trees and bushes. Shown on the ROF Pembrey plans within the Tetryl Area. A Pyper 2015

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107880

NAME - ROF PEMBREY **TYPE** - EXPLOSIVES MANUFACTURING SITE **PERIOD** - MODERN

EVIDENCE - EARTHWORK **CONDITION** - NOT KNOWN

NGR - SN4066801053 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

A large earthen mound roughly 50m across, which appears to be a magazine though no entrances are accessible and the mound is well grown over with trees and bushes. Shown on the ROF Pembrey plans within the Tetryl Area. A Pyper 2015

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107881

NAME - ROF PEMBREY **TYPE** - BUILDING **PERIOD** - MODERN

EVIDENCE - BUILDING **CONDITION** - NEAR INTACT

NGR - SN41670015 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

A courtyard of brick built single storey buildings shown on the ROF plan of 1958 as A1119, though its function is uncertain it lies within the administration area of the factory. It is currently a depot for Carmarthenshire County Council. A Pyper 2016.

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107882

NAME - ROF PEMBREY **TYPE** - ENGINEERING WORKSHOP **PERIOD** - MODERN

EVIDENCE - BUILDING **CONDITION** - CONVERTED

NGR - SN40500061 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

A brick built building shown on the 1958 ROF plan as W18, though its function is unknown. Before it was converted (now a cafe) it was apparently open to the ceiling and had a gantry crane and is thought to have been a workshop for large machine or railway engines (D Hughes pers com). A Pyper 2015

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107883

NAME - ROF PEMBREY Main Gate **TYPE** - GATEHOUSE **PERIOD** - MODERN

EVIDENCE - BUILDING **CONDITION** - NEAR INTACT

NGR - SN41530046 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The main gate for the ROF factory. A red brick single storey, flat roofed structure sits to the northeast of the gate piers with a small pedestrian entrance and a double entrance for vehicles

and a further small gatehouse building again flat roofed. A Pyper 2016

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107884

NAME - ROF PEMBREY **TYPE** - PUMP HOUSE **PERIOD** - MODERN

EVIDENCE - BUILDING **CONDITION** - NEAR INTACT

NGR - SN41520012 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

A water pump house, built of red brick with a flat concrete roof. Within it is a deep sunken chamber and water pipes. Within it are iron valves and the remains of a switchboard. The pump house is shown on the 1958 ROF plan of Pembrey. A Pyper 2016

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107892

NAME - HMF PEMBREY Factory Magazine **TYPE** - MAGAZINE **PERIOD** - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN4056000003 **COMMUNITY** -

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Factory Magazine. This enclosure would have surrounded the magazines of the First World War munitions factory at Pembrey. A blast bank protected against any explosions and an entry was afforded through the curving brick tunnel with concrete slab roof which lies to the side of the enclosure. The enclosure itself is approximately 26m in diameter and the banks around 3metres high. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107893

NAME - HMF PEMBREY Factory Magazine **TYPE** - MAGAZINE **PERIOD** - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN4050500066 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Factory Magazine. This enclosure would have surrounded the magazines of the First World War munitions factory at Pembrey. A blast bank protected against any explosions and an entry was afforded through the curving brick tunnel with concrete slab roof which lies to the side of the enclosure. The enclosure itself is approximately 26m in diameter and the banks around 3 metres high. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 107894

NAME - TYPE - STRUCTURE **PERIOD -** MODERN

EVIDENCE - EXTANT STRUCTURE **CONDITION -** NEAR INTACT

NGR - SN4065600767 **COMMUNITY -** Cefn Sidan

HER DESCRIPTION -

Solid brick built structure, 98 x 398 x 93cm high. Situated beside and parallel to the path, formerly a railtrack. Uncertain function as it doesn't appear on any of the plans for the munitions factories. A Pyper 2016

SOURCES -

SOURCE 2

PRN - 107895

NAME - ROF PEMBREY **TYPE -** BUILDING **PERIOD -** MODERN

EVIDENCE - BUILDING **CONDITION -** NOT KNOWN

NGR - SN4016800249 **COMMUNITY -** Cefn Sidan

HER DESCRIPTION -

Brick single storey building shown on ROF Pembrey plans which in the 1962 is identified as the 'breaking down plant area'. A Pyper 2015.

SOURCES - 1958 R.O.F Pembrey Layout of Factory

SOURCE 2

PRN - 107898

NAME - BURRY EXTENSION WORKS; LLANELLY NATIONAL SHELL FACTORY **TYPE -** MUNITIONS FACTORY **PERIOD -** MODERN

EVIDENCE - DOCUMENTARY EVIDENCE **CONDITION -** DESTROYED

NGR - SS50919810 **COMMUNITY -** Cefn Sidan

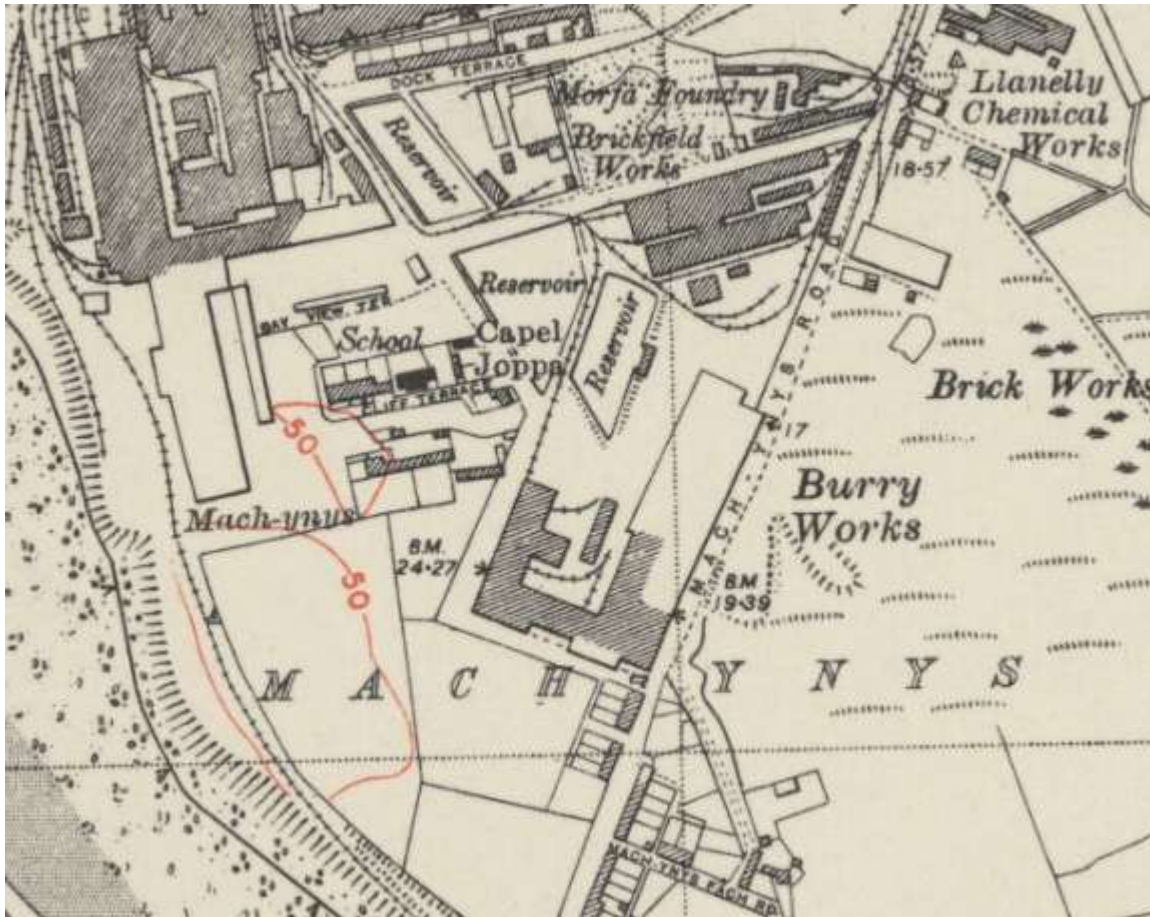
HER DESCRIPTION -

Burry Extension opened in 1912 to the southwest of Burry Tinplate works. During the First World War, in response to the national shell crisis in 1915, the factory was adapted to become a National Shell Factory. A team of Llanelli Engineers and Industrialists met on 12th September 1915 and Mr Richard Beaumont Thomas offered the use of the Burry Extension Works at Machynys for the manufacture of 'Six Inch' shells. Two days later the Ministry accepted and approved of the scheme. Operations commenced on the 17th October 1915. In September 1916 instructions for a Rectification Factory led to a factory being built adjacent to the shell factory and this started production in April 1917 (PRN 109251). The shell factory was dismantled and sold in 1919. The site has now been cleared and the land partially built over for housing. Alice Pyper based on Owen Marker and Lyn John, 'Llanelli National Shell and Rectification Factories'.

Ordnance Survey Carmarthenshire LVIII.SE Revised: 1938 Published: ca. 1948



OS Six-inch England and Wales, Carmarthenshire LVIII.SE, Revised: 1913, Published: 1921.



OS Six-inch England and Wales, Carmarthenshire LVIII.SE, Revised: 1938, Published: c.1948.



Burry Extension Works early 1980s, Llanelli Ref. Library.



The First Shell January 31st 1916, Llanelli Ref. Library.

PRN - 109248

NAME - HMF PEMBREY Guncotton Weighing House **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN3993501366 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as 'Guncotton weighing house'. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the brick tunnel with concrete slab roof which lies to the side of this enclosure. A secondary entrance tunnel lies on the opposite side of the enclosure. The enclosure is sub-rectangular, overgrown on the interior and a full description therefore not possible. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 109249

NAME - HMF PEMBREY Guncotton Expense Magazine **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN39960143 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

An earth and sand enclosure with a brick built tunnel entrance through the bank, in front of the entrance is a concrete square pit. Identified on the 1917 plan as a Guncotton expense magazine. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey. In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the brick tunnel with concrete slab roof which lies to the side of this enclosure. A secondary entrance tunnel lies on the opposite side of the enclosure. The enclosure is sub-rectangular, overgrown on the interior and a full description therefore not possible. A Pyper 2016

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 109250

NAME - HMF PEMBREY Guncotton Drying stove **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN40420052 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

A circular earth banked structure, semi-infilled with the remains of a brick built tunnel exposed. Identified on the c1917 plan of HMF Pembrey as one of a number of Gun Cotton Drying stoves.

SOURCES - c1917 HMF Pembrey Block plan of plant

SOURCE 2

PRN - 109251

NAME - LLANELLY RECTIFICATION FACTORY **TYPE** - MUNITIONS FACTORY **PERIOD** - MODERN

EVIDENCE - DOCUMENTARY EVIDENCE **CONDITION** - NOT KNOWN

NGR - SS50999816 **COMMUNITY** - Llanelli

HER DESCRIPTION -

During the First World War and in response to the National Shell crisis of 1915, a board of Management was appointed to oversee the manufacture of shells using the Burry Extension Works. On September 22nd 1916 instructions were issued for the erection of a large Rectification Factory, laying down plant for the rectification of various types and sizes of shell, from 18 pounders to six inch. The factory was the first of its kind in the country and was completed in record time with operations commenced on Monday April 23rd 1917. Based on the 3rd and 4th edition OS maps (pub 1916 & 1953) the new factory was built on the northeast side of the Burry Extension Works. A Pyper based on the Resume of Work Accomplished at the Llanelly National Shell and Rectification Factories 1919 and OS maps.

SOURCES - Owen Marker & Lyn John The Llanelly National Shell and Rectification Factories
Ordnance Survey pub 1916 Third edition 1:2500
Ordnance Survey 1952 Carmarthenshire LVIII.SE
A J Bevin 1919 Resume of work accomplished at the Llanelly National Shell and Rectification Factories. 1919

SOURCE 2

PRN - 109252

NAME - NATIONAL FILLING FACTORY NO 18 PEMBREY **TYPE** - MUNITIONS FACTORY **PERIOD** - MODERN

EVIDENCE - DOCUMENTARY EVIDENCE **CONDITION** - NEAR DESTROYED

NGR - SS40769977 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Adjacent to the HM Factory Pembrey, which was producing high explosives and propellants, a loading plant was constructed for filling shells, mines and torpedoes. This factory was built and managed by the Explosives Loading Company, working as agents for the Ministry of Munitions from 1917. 200 tons of high explosive were consumed each week and from 2 July 1915 to May 1917, 1,143,000 shells were filled. From 1917 the factory started breaking down defective ammunition to recover the components. Over 1000 people worked in this factory and 70% of them were women. This factory was cleared for the construction of the Royal Ordnance Factory Pembrey in 1938-9. A Pyper 2016, based on the Official History of the Ministry of Munitions.

SOURCES - c1917 HMF Pembrey Block plan of plant
HMSO 1922 repub The Official History of The Ministry of Munitions Volume VIII

SOURCE 2

PRN - 109253

NAME - **TYPE** - CHEMICAL WORKS **PERIOD** - MODERN

EVIDENCE - DOCUMENTARY EVIDENCE **CONDITION** - NOT KNOWN

NGR - SN422207 **COMMUNITY** - Carmarthen

HER DESCRIPTION -

The government planned and started to construct a wood distillation works in 1917 but it was unfinished. Acetone made from wood distillation was used in making cordite for munitions. Articles in the local paper refer to sixteen thousand pounds being spent on the construction of the new works, but the scheme was abandoned. The fatality of a labourer working on the construction of the works who was crushed on the railway sidings in 1918 is recorded in the local paper. The location of the works has not been confirmed, it is referred to as located at Dolgwili and the accident happened on the GWR railway sidings. A Pyper 2016 based on Cocroft and local newspaper articles.

SOURCES - Cocroft, Wayne D 2000 Dangerous Energy, The archaeology of gunpowder and military explosives manufacture
Cambria Daily Leader 1919
The Carmarthen Journal and South Wales Weekly Advertiser 1918

SOURCE 2

PRN - 109254

NAME - ROF PEMBREY **TYPE** - AIR RAID SHELTER **PERIOD** - MODERN

EVIDENCE - STRUCTURE **CONDITION** - NEAR INTACT

NGR - SN4078800760 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

An air raid shelter has been constructed utilizing the tunnel entrance to one of the First World War enclosures (PRN 107863). The tunnel entrance has been converted into an Air Raid Shelter with brick blocked entrances at either end with ventilation holes above a low entrance way. The splayed tunnel entrances also have a blast wall built partially blocking the way in. Within the tunnel low brick piers are arranged along either wall which would have supported bench seating. A Pyper 2016

SOURCES -

PRN - 109255

NAME - HMF PEMBREY Wash Water Settling House **TYPE** - EXPLOSIVES MANUFACTURING SITE **PERIOD** - MODERN

EVIDENCE - STRUCTURE **CONDITION** - Damaged

NGR - SN4005801257 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Identified on the HMF Pembrey plan of plant as a Wash Water Settling House, what can be seen on the ground is a brick and concrete tunnel beneath the former railway (now footpath). On the east of the path is a sunken area forming a bowl shaped depression in the ground.

A Pyper 2016

SOURCES -

HMF Pembrey Block plan of plant SUPP 10/72

PRN - 109256

NAME - HMF PEMBREY N/G Washing House **TYPE** - EXPLOSIVES MANUFACTURING SITE **PERIOD** - MODERN

EVIDENCE - STRUCTURE **CONDITION** - DAMAGED

NGR - SN4021201260 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Earth and sand embanked enclosure with three brick entrance tunnels, one narrow - pedestrian and two wider curved tunnels. Labelled on 1917 plan as N/G Washing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey.

In this area cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank

The structure now lies in woodland and is overgrown with saplings and brambles.

A Pyper 2016

SOURCES -

HMF Pembrey Block plan of plant SUPP 10/72

SOURCE 2

PRN - 109257

NAME – HMF PEMBREY Nitrator Separator **TYPE –** EXPLOSIVES MANUFACTURING SITE **PERIOD -** MODERN

EVIDENCE - STRUCTURE **CONDITION -** Not known

NGR - SN40160130 **COMMUNITY -** Cefn Sidan

HER DESCRIPTION -

Labelled on 1917 plan as Nit. Separator (Nitrator). High up on a hill are the remains of the Nitrator Separator House.

It is located high up above the other cordite mixing areas in order to allow gravity to run off nitroglycerine which was too dangerous to pump or carry.

In this area during the First World War cordite paste, a propellant for munitions, was being manufactured. The explosive nature of the process required each building to be surrounded by a blast bank and an entrance to it was through the curved brick built tunnel.

A Pyper 2016

SOURCES -

HMF Pembrey Block plan of plant SUPP 10/72

SOURCE 2

PRN - 109258

NAME – HMF PEMBREY Guncotton Weighing House **TYPE –** EXPLOSIVES MANUFACTURING SITE **PERIOD -** MODERN

EVIDENCE - STRUCTURE **CONDITION -** Not known

NGR - SN39990124 **COMMUNITY -** Cefn Sidan

HER DESCRIPTION -

Labelled on the 1917 plan of HM Pembrey as a Gun cotton weighing house. An enclosure of earth surrounds the former danger buildings within this area of cordite production.

A Pyper 2016

SOURCES -

HMF Pembrey Block plan of plant SUPP 10/72

SOURCE 2

PRN - 109259

NAME – HMF PEMBREY Guncotton Expense Magazine **TYPE –** EXPLOSIVES MANUFACTURING SITE **PERIOD -** MODERN

EVIDENCE - STRUCTURE **CONDITION -** Intact

NGR - SN39930129 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

Labelled on the 1917 plan as Guncotton Expense Magazine.

An earth enclosure surrounds the former magazine within this area of cordite production. When visited in 2016 the mound is in woodland with dense brambles restricting access to the site.

A Pyper 2016

SOURCES -

HMF Pembrey Block plan of plant SUPP 10/72

SOURCE 2

PRN - 109289

NAME - HMF PEMBREY Guncotton Drying Stoves **TYPE** - EXPLOSIVES MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - Near Intact

NGR - SN40120148 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The site of a guncotton drying stove.

Earth banks surround the danger buildings in this area of cordite production during the First World War. The buildings were accessed by two entrances through the banks, one with a railway track entering through a curved brick built tunnel and a second entrance opposite the first for pedestrian access only. Labelled as Guncotton Drying Stoves on the 1917 plan of HMF Pembrey.

Now lying in woodland and dense undergrowth, when visited in 2016 the banks are still surviving in some form, though largely inaccessible due to the vegetation.

A Pyper 2016

SOURCES -

HMF Pembrey Block plan of plant SUPP 10/72

SOURCE 2

PRN - 109290

NAME - HMF PEMBREY Guncotton Drying Stoves **TYPE** - EXPLOSIVE MANUFACTURING
SITE PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - Near Intact

NGR - SN40090153 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The site of a guncotton drying stove.

Earth banks surround the danger buildings in this area of cordite production during the First World War. The buildings were accessed by two entrances through the banks, one with a railway track entering through a curved brick built tunnel and a second entrance opposite the first for pedestrian access only. Labelled as Guncotton Drying Stoves on the 1917 plan of HMF Pembrey.

Now lying in woodland and dense undergrowth, when visited in 2016 the banks are still surviving in some form, though largely inaccessible due to the vegetation.

A Pyper 2016

SOURCES -

HMF Pembrey Block plan of plant SUPP 10/72

SOURCE 2

PRN – 109291

NAME – HMF PEMBREY Guncotton Drying Stove **TYPE** – EXPLOSIVE MANUFACTURING
SITE **PERIOD** - MODERN

EVIDENCE - STRUCTURE **CONDITION** - Near Intact

NGR - SN40160152 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The site of a guncotton drying stove.

Earth banks surround the danger buildings in this area of cordite production during the First World War. The buildings were accessed by two entrances through the banks, one with a railway track entering through a curved brick built tunnel and a second entrance opposite the first for pedestrian access only. Labelled as Guncotton Drying Stoves on the 1917 plan of HMF Pembrey.

Now lying in woodland and dense undergrowth, when visited in 2016 the banks are still surviving in some form, though largely inaccessible due to the vegetation.

A Pyper 2016

SOURCES -

HMF Pembrey Block plan of plant SUPP 10/72

SOURCE 2

PRN - 109292

NAME – HMF PEMBREY Guncotton Drying Stove **TYPE** – EXPLOSIVE MANUFACTURING
SITE **PERIOD** - MODERN

EVIDENCE - STRUCTURE **CONDITION** - Near intact

NGR - SN40140157 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The site of a guncotton drying stove.

Earth banks surround the danger buildings in this area of cordite production during the First World War. The buildings were accessed by two entrances through the banks, one with a railway track entering through a curved brick built tunnel and a second entrance opposite the first for pedestrian access only. Labelled as Guncotton Drying Stoves on the 1917 plan of HMF Pembrey.

Now lying in woodland and dense undergrowth, when visited in 2016 the banks are still surviving in some form, though largely inaccessible due to the vegetation.

A Pyper 2016

SOURCES -

HMF Pembrey Block plan of plant SUPP 10/72

SOURCE 2

PRN - 109293

NAME – HMF PEMBREY Guncotton Drying Stove **TYPE** - EXPLOSIVE MANUFACTURING SITE
PERIOD - MODERN

EVIDENCE - STRUCTURE CONDITION - Not known

NGR - COMMUNITY - Cefn Sidan

HER DESCRIPTION -

The site of a guncotton drying stove heating house.

Earth banks surround the danger buildings in this area of cordite production during the First World War. The buildings were accessed by two entrances through the banks, one with a railway track entering through a curved brick built tunnel and a second entrance opposite the first for pedestrian access only. Labelled as Guncotton Drying Stoves heating house on the 1917 plan of HMF Pembrey.

Now lying in woodland and dense undergrowth, when visited in 2016 the banks are still surviving in some form, though largely inaccessible due to the vegetation.

A Pyper 2016

SOURCES -

HMF Pembrey Block plan of plant SUPP 10/72

SOURCE 2

PRN - 109294

NAME - HMF Gun cotton Drying Stoves **TYPE -** EXPLOSIVE MANUFACTURING SITE **PERIOD -** MODERN

EVIDENCE - STRUCTURE CONDITION - Damaged

NGR - SN40210156 **COMMUNITY -** Cefn Sidan

HER DESCRIPTION -

The site of a guncotton drying stove heating house.

Earth banks surround the danger buildings in this area of cordite production during the First World War. The buildings were accessed by two entrances through the banks, one with a railway track entering through a curved brick built tunnel and a second entrance opposite the first for pedestrian access only. Labelled as Guncotton Drying Stoves heating house on the 1917 plan of HMF Pembrey.

Now lying in woodland and dense undergrowth, when visited in 2016 the banks are still surviving in some form, though largely inaccessible due to the vegetation.

A Pyper 2016

SOURCES -

HMF Pembrey Block plan of plant SUPP 10/72

SOURCE 2

PRN - 109295

NAME - HMF PEMBREY Gun cotton Drying Stoves **TYPE -** EXPLOSIVE MANUFACTURING SITE **PERIOD -** MODERN

EVIDENCE - STRUCTURE CONDITION - Damaged

NGR - SN40250159 **COMMUNITY -** Cefn Sidan

HER DESCRIPTION -

The site of a guncotton drying stove.

Earth banks surround the danger buildings in this area of cordite production during the First World War. The buildings were accessed by two entrances through the banks, one with a railway track

entering through a curved brick built tunnel and a second entrance opposite the first for pedestrian access only. Labelled as Guncotton Drying Stoves on the 1917 plan of HMF Pembrey.

Now lying in woodland and dense undergrowth, when visited in 2016 the banks are still surviving in some form, though largely inaccessible due to the vegetation.

A Pyper 2016

SOURCES -

HMF Pembrey Block plan of plant SUPP 10/72

SOURCE 2

PRN - 109296

NAME – HMF PEMBREY Gun cotton Drying Stoves **TYPE** - EXPLOSIVE MANUFACTURING SITE

PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - Damaged

NGR - SN40230165 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The site of a guncotton drying stove.

Earth banks surround the danger buildings in this area of cordite production during the First World War. The buildings were accessed by two entrances through the banks, one with a railway track entering through a curved brick built tunnel and a second entrance opposite the first for pedestrian access only. Labelled as Guncotton Drying Stoves on the 1917 plan of HMF Pembrey.

Now lying in woodland and dense undergrowth, when visited in 2016 the banks are still surviving in some form, though largely inaccessible due to the vegetation.

A Pyper 2016

SOURCES -

HMF Pembrey Block plan of plant SUPP 10/72

SOURCE 2

PRN - 109297

NAME – HMF PEMBREY Gun cotton Drying Stoves **TYPE** - EXPLOSIVE MANUFACTURING SITE

PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** - Damaged

NGR - SN40300163 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The site of a guncotton drying stove.

Earth banks surround the danger buildings in this area of cordite production during the First World War. The buildings were accessed by two entrances through the banks, one with a railway track entering through a curved brick built tunnel and a second entrance opposite the first for pedestrian access only. Labelled as Guncotton Drying Stoves on the 1917 plan of HMF Pembrey.

Now lying in woodland and dense undergrowth, when visited in 2016 the banks are still surviving in some form, though largely inaccessible due to the vegetation.

A Pyper 2016

SOURCES -

HMF Pembrey Block plan of plant SUPP 10/72

SOURCE 2

PRN - 109298

NAME – HMF PEMBREY Gun cotton Drying Stoves **TYPE** - EXPLOSIVE MANUFACTURING SITE
PERIOD - MODERN

EVIDENCE - STRUCTURE **CONDITION** -

NGR - SN40280169 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

The site of a guncotton drying stove.

Earth banks surround the danger buildings in this area of cordite production during the First World War. The buildings were accessed by two entrances through the banks, one with a railway track entering through a curved brick built tunnel and a second entrance opposite the first for pedestrian access only. Labelled as Guncotton Drying Stoves on the 1917 plan of HMF Pembrey.

Now lying in woodland and dense undergrowth, when visited in 2016 the banks are still surviving in some form, though largely inaccessible due to the vegetation.

A Pyper 2016

SOURCES -

HMF Pembrey Block plan of plant SUPP 10/72

SOURCE 2

PRN - 109299

NAME – HMF PEMBREY **TYPE** - BUILDING **PERIOD** - MODERN

EVIDENCE - STRUCTURE **CONDITION** -

NGR - SN39180216 **COMMUNITY** - Cefn Sidan

HER DESCRIPTION -

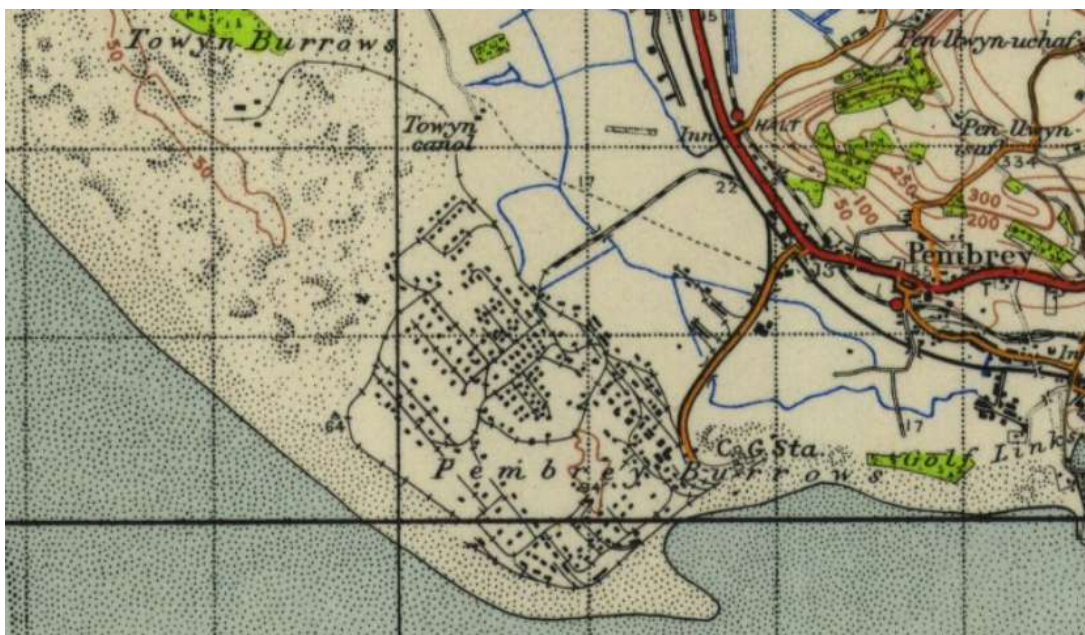
The one inch New Popular Ordnance Survey shows a group of buildings or structures at the end of a sinuous railtrack heading out into Pembrey Forest emerging from the Munitions Factory.

When the site was visited in 2016 the railtrack is now a forest road and the location of the buildings is now dense with trees and scrub and therefore no trace of buildings could be identified.

A Pyper 2016

SOURCES -

Ordnance Survey : pub1946 : OS One-Inch New Popular with National Grid: Sheet 152 - Ordnance Survey



OS One-inch England and Wales, New Popular Edition, 1945-47, sheet 152 – Carmarthen and Tenby. Publication date 1946.

<http://maps.nls.uk/os/one-inch-new-popular/index.html>

PRN - 109300

NAME – GWR MARINE FACTORY **TYPE** - FACTORY **PERIOD** - MODERN

EVIDENCE – DOCUMENTARY EVIDENCE **CONDITION** - Not known

NGR - SM947381 **COMMUNITY** - Fishguard and goodwich

HER DESCRIPTION -

Marine Factory at Fishguard carried out the fitting out of the Great Western Railway company fleet of steamships into hospital ships during the First World War. The exact location of the factory is unknown.

The turbine vessels of St. David, St Patrick and St. Andrew, were employed on the Fishguard-Rosslare service until they were all commandeered by the Admiralty and converted into hospital ships. The fitting of the ships for their new duties was carried out by the companys Marine Factory staff at Fishguard. This included provisioning 200 cot cases and the construction of lifts in which the patients in their cots could be transferred to or from the main and lower decks of the ships.

After the armistice they were converted into troop ships and used in connection with the demobilization for the British Armies in France.

A Pyper based on Pratt 1921, p934

SOURCES -

Pratt, Edwin A : 1921 : British railways and the great war; organisation, efforts, difficulties and achievements

SOURCE 2

Threat-Related Assessment of Twentieth Century Military Sites: FIRST WORLD WAR - *Industry and Manufacturing*

Interim Report Year 2

DAT Event Record No. 108537

Report No. 2016/21

Cadw Project No. DAT 115B

Mawrth 2016

March 2016

Paratowyd yr adroddiad hwn gan / This report has been prepared by Alice Pyper

Swydd / Position: Heritage Management Project Manager

Llofnod / Signature .  Dyddiad / Date 31.03.2016

Mae'r adroddiad hwn wedi ei gael yn gywir a derbyn sêl bendith

This report has been checked and approved by Ken Murphy

ar ran Ymddiriedolaeth Archaeolegol Dyfed Cyf.

on behalf of Dyfed Archaeological Trust Ltd.

Swydd / Position: Director

Llofnod / Signature  Dyddiad / Date 31.03.2016

Yn unol â'n nôd i roddi gwasanaeth o ansawdd uchel, croesawn unrhyw sylwadau sydd gennych ar gynnwys neu strwythur yr adroddiad hwn

As part of our desire to provide a quality service we would welcome any comments you may have on the content or presentation of this report



