

COASTAL SURVEY 1997-98

CARMARTHEN BAY

Ginst Point to Loughor

1998



Grant-aided by
Cadw: Welsh Historic Monuments

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Front Cover: Coraclemen and the bascule bridge on the Tywi below Carmarthen.
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SUMMARY

The eastern half of Carmarthen Bay and the northern shores of the Burry Estuary covered in this final Cadw-Coastal Survey Report carried out by Archaeoleg Cambria Archaeology (Dyfed Archaeological Trust) contrasts markedly with much of the coastline further west in that it is a less stable environment constantly changing through natural processes and human actions and interventions. There are large areas of accretion, notably the sand spits of Pendine and Cefn Sidan; the latter expanding both at its western and eastern extremities; within the estuaries silting is creating new tidally inundated saltmarshes. But of course, within the overall sedimentary budget of the Bay widespread accretion also causes localised areas of erosion and at a few, but critical, locations this is affecting archaeological sites and deposits. The rapidly eroding deserted medieval settlement of St Ishmael's and the peat shelves off Morfa Bacas are two prominent examples.

Whilst accretion across the study area is not new, there is good evidence to show (see below) that it has accelerated since the 16th century. The consequent navigation difficulties and ever-larger ships presented a constant challenge to the developing mineral and manufacturing industries of south east-Carmarthenshire which depended on sea transport for export - and import of raw materials. This is reflected in the wealth of physical evidence for former shipping places, early wharves and quays, and new harbours and docks, also in the sparser remains of constant efforts to maintain and improve the navigation. It was ultimately a losing battle even for a major port like Llanelli. Within the greater part of this area, more so than many covered by the pan-Wales Cadw Coastal Surveys, earlier coastlines are now many kilometres inland. Their locations are thus outside the scope of this Report and the Cadw surveys but they have been the subject of recently Cadw funded wetlands surveys (Page 1996; Page 1997) to which the reader is also referred. The physical traces of banks, drains and sluices that are widespread on the coasts and estuaries testify to centuries of endeavour in winning land from the sea and feature strongly in the area's coastal archaeology but again for the full description inland of the coast reference should be made to earlier studies.

The shallow waters of Carmarthen Bay, the extensive sandbanks and the high tidal range give this area an extensive inter-tidal environment. Not only are there numerous historic wreck sites, but the shifting sands mean that new wrecks can be quickly revealed and re-covered and the extent exposed of known sites varies enormously (James T 1993). A start has been made on recording these sites (Page 1997b) but more needs to be done. Perhaps even more vulnerable are areas, some quite small, of 'submerged forests' - peat shelves of Flandrian or later dates. These are less well known than those in the western side of the Bay, and more fragmentary and vulnerable. Fishtraps too are being identified as inter-tidal fieldwork is carried out.

A number of Recommendations are made for future work and for better management of this rich coastal archaeological resource. This active coastline continues to require considerable hard engineered interventionist works for coastal defence and it is fair to say that in the past opportunities for archaeological observation and recording have been lost. The rapid de-industrialisation of the Llanelli coastline has led to extensive redevelopment for leisure, residential and light industrial purposes, that has culminated in the Millennium Coastal Park Scheme. New or changed environments designed for wildlife are a feature of the late 20th century's impact on this coastline. It is important that archaeological sites and historic landscapes are not destroyed or degraded in these developments. It is hoped that this Report will be of use to all involved in the management and development of this area of coast and estuary in showing what is known of earlier sites and environments. More ambitiously, the authors consider that it will have been successful if the potential for further archaeological discoveries is appreciated as well as the interest and value of the historic resource as a whole.

The archaeological and historical importance of eastern Carmarthen Bay has been recognised with its inclusion in the recently published Register of Landscapes of Outstanding Historic Interest in Wales (published by CCW, Cadw and ICOMOS UK, 1998).

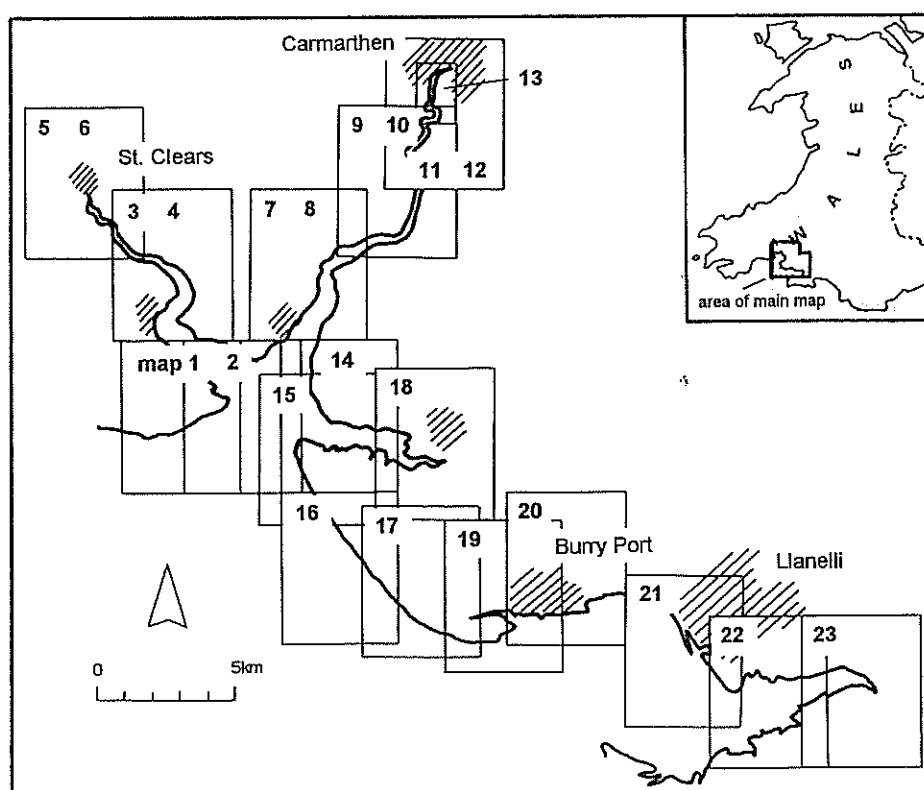
INTRODUCTION

This survey formed part of the pan-Wales initiative, grant-aided by Cadw: Welsh Historic Monuments, to assess the archaeological resource of the entire Welsh coastline. Over the last few years there has been increased public awareness of the pressures facing the archaeology and ecology of the coastal zone, such as rising sea levels, coastal erosion, industrial and residential development and leisure activities. The pan-Wales initiative to record and assess the diversity, importance and vulnerability of the archaeological resource of the coastal zone will make an important contribution to future management strategies for the coastline of Wales.

This project covered a length of coastline from Ginst Point, Carmarthenshire (NGR SN 3270 0870) to Loughor (NGR SS 5610 9800) on the Carmarthenshire - West Glamorgan border. It included parts of the rivers Taf, Tywi, Gwendraeth Fach, Gwendraeth Fawr and Loughor, a total distance of 122.12km. The survey area was defined as a strip extending 150m inland from Mean High Water, plus the intertidal zone.

METHODOLOGY

The methods employed were those developed during earlier surveys and comprised the extraction of existing records from the regional Sites and Monuments Record (SMR), cartographic and documentary searches and field visits. The cartographic searches were extensive, but not necessarily exhaustive; all sources with relevant information are referenced on the individual site record forms in the SMR. A further element of this project was the re-casting of the results from earlier assessments of the coastal wetlands between Kidwelly and Loughor (Page 1996; 1997) into a format compatible with the coastal surveys.



THE STUDY AREA

GEOLOGICAL AND GEOMORPHOLOGICAL BACKGROUND

The solid geology of the majority of the southern part of the survey area is represented by the red marl sedimentary deposits of Old Red Sandstone (ORS) of Devonian age. On the Taf estuary the ORS facies are represented from Ginst Point in the south up to Llandeilo Abercywyn (NGR SN 3100 1300) where they pass into a narrower band of the basal Green Beds of the ORS. The same sequence is represented on the Tywi estuary from Wharley Point and Ferryside up to Green Castle (NGR SN 3960 1658).

North of Llandeilo Abercywyn and Green Castle up to the limits of the survey area, at Carmarthen and St. Clears respectively, both rivers pass over much faulted and folded beds of Ordovician shale, mudstone and grit, derived variously from the Llanvirn, Arenig and Ashgill series.

At Craig Ddu (NGR SN 3250 1002) Carboniferous limestone outcrops on the cliffs overlooking the Taf estuary as an outlier of the main ORS.

Adjacent to and north of the Green Beds at Llandeilo Abercywyn, older Ordovician limestone beds are represented. These beds have been down-faulted in an approximately northerly direction, re-emerging and forming a ridge upon which lies the motte and bailey castle south west of Trefenty (NGR SN 2990 1361).

At Green Castle the Tywi has cut a steep-sided gorge through the ORS. It has been argued (Cope 1982) that the ORS "may have been initially breached by river capture by a headward erosion of a stream rising on the ORS flowing to the south" and that the earlier course of the Tywi would have been further north flowing west from Carmarthen where it joined the Taf river system near Bancyfelin. Certainly, the glacial moraine deposits to the south of Carmarthen could very well have blocked the original route of the river, leaving only the original valley configuration following the westerly route of the present A 40 road through the marshland to Bancyfelin where the valley now turns south containing the Afon Cywyn which has its confluence with the Taf at Llandeilo Abercywyn.

Glacial drift deposits are represented by boulder clay along the entire lengths of both the Taf and the Tywi, following each valley margin. These deposits fan out and become extensive north of Llandeilo Abercywyn up to St. Clears and Bancyfelin.

There are extensive sand and gravel glacial moraine deposits on the west bank of the Tywi on the south side of Carmarthen, mentioned above, which extend westwards as far as Sarnau (NGR SN 3360 1860) some 6.5 km distant. These morainic deposits, in the form of drumlins, were left by the retreating Towy Glacier at the close of the last, Devensian, ice age.

The post-glacial drift geology in the survey area is represented by blown sand deposits at Laugharne Burrows, Pembrey Burrows and Twyn Burrows with similar, but less extensive deposits at Black Scar, Ferryside, Llanstephan and St. Ishmael.

Marine alluvial mud and sand deposits are extensive up both river valleys and associated salt marshes are commonplace. The Burry Inlet and Loughor Estuary has the second largest area of saltmarsh, over 2,000 hectares, in Britain (Burd 1989, 151; Smith and Yonow 1995, 38). Another large area of saltmarsh lies to the north of the sand dunes known as the Laugharne Burrows, to the west of Ginst Point. These sand dunes are the continuation of the Pendine, Great Hill and Little Burrows to the west which have formed as a result of sand being blown from Pendine Sands by prevailing winds and piled up. The dunes impede the land drainage and have caused the impressive stretch of flat alluvial marsh behind them. The steep ORS cliffs, St. John's Hill, to the south of Laugharne rise suddenly and overlook the marsh, Ginst Point, the mouths of both the Taf and Tywi and further east St. Ishmael and the mouth of the Gwendraeth River.

EFFECTS OF SEA LEVEL CHANGES ON THE COAST

Ice-sheet formation on the landscape during successive periods of glaciation effected a marked lowering of sea level, possibly by as much as 60m at maximum glaciation, as the freezing water became entrapped in glaciers and ice caps. The world-wide melting of the ice at the end of the Devensian, c. 12,000 BP, released the entrapped waters (the so-called Flandrian transgression) and led to a rise in sea levels. It is estimated that sea levels had risen to their modern levels by about 4000-3500 BC, so quite clearly the shoreline topography and environments experienced by early humans around Carmarthen Bay and its river systems would have been markedly different from those of today. Hunter-gathering groups of the late glacial and early post-glacial period would have occupied camps on the tops of inland cliffs overlooking wide fertile plains below, with the sea beyond; archaeological evidence in the form of numerous mesolithic flint working floors on the cliff tops of West Wales is abundant. It is likely that those former plains and shorelines, which now lie beneath the sea, yielded the flints and other raw materials for the manufacture of tools.

Partial evidence for the post-glacial sea level rise are the peat shelves, or submerged forests, which lie on the foreshore at several locations around the west Wales coastline and within the survey area at Salmon Point Scar, Pwll and Morfa Bacas, Llanelli. The formation processes of the peat shelves are reasonably well understood. As sea levels continued their rise from the last ice age and approached their modern limits, bars, spits or other barriers formed across bays and coves, enabling the formation of shallow, fresh water, lagoons behind them. Peat began to form in the lagoons, but development of the bars and spits was unable to keep up with the rising sea levels and these barriers were breached resulting in the submergence of the peat deposits. At Laugharne and Pendine the coastal barrier was not breached and eventually developed into the line of modern dunes we see today and behind these, in the marsh, peaty lagoon deposits lie buried beneath later deposits of silt and the cultivated land surface.

ARCHAEOLOGICAL SITES & HISTORICAL PROCESSES

This section is intended to provide an overview of the most important sites, historical events and processes for the eastern part of Carmarthen Bay and the Burry Estuary. This will give a context for the summary list and maps of sites in the Gazetteer section of the Report.

EARLY PREHISTORY (5,000 - 800 BC)

Within Carmarthen Bay, there is important archaeological evidence from cave sites of 'Ice-Age Hunters' - early hominids of Palaeolithic, or Old Stone Age date. Occupation of Coygan Cave by Neanderthals - predecessors of modern humans, took place some 200,000 years ago. Much nearer in time are the cave sites of Caldey Island and the Ritec Valley near Tenby with human occupation from Late Glacial times (about 12,000 years BP). The environment, although rapidly warming in inter-glacials, was quite different from today with a much lower sea level and a dry Bristol Channel plain. But before the end of the last Ice Age c. 10,000 years ago there is evidence (much debated by scholars) of a much higher sea-level than today in the form of raised beach deposits on Caldey and the south coast of the Gower, and perhaps at Craig-Lon near Pembrey and a fossilised line of former sea cliffs from Coygan in the west to St Ishmael's, Pembrey and Pwll north of Llanelli (Bowen 1980). Beaches or coastal flats of 125,000 years ago (the date of the raised beaches) have since been buried below massive glacial deposits, which, together with alluvial fans and the recent sand dunes, constitute the present coast line of most of eastern Carmarthen Bay and the Burry Estuary.

As described above, the most striking evidence for sea level changes since the last glaciation are the so-called 'submerged forests' and peat shelves. Radio-carbon dates from these exposures obtained from the western side of Carmarthen Bay fall within the fifth and fourth millenium BC. In addition to indicating sea-level changes they are of great interest archaeologically in that they span the transition period between mesolithic 'hunter-gatherers' and Neolithic farmers. It is now thought that the transition from the two lifestyles may have been more gradual than previously supposed particularly in coastal areas where a diversity of habitats and seasonally available foods favoured the continuation of hunter-gatherer lifestyles.

Although not as extensive as the exposures at Marros and Amroth on the western side of Carmarthen Bay, the wetland and coastal surveys for the eastern side of the Bay and within the Burry Estuary on which this Report is based, have identified and plotted exposures off St Ishmael's at the mouth of the Tywi estuary and within the Burry Estuary at Llanelli and Llangennech on the lower Loughor. At Morfa Bacas, Llanelli (PRN 31317 - Map 23) recent work arising from the 1997 Wetlands Survey (Page 1997), has provided important new dating evidence for sea-level rise at the eastern end of Carmarthen Bay with a radiocarbon date of 4190±80 BP (SWAN-238). This date for the inundation of the coastal barrier protecting the coastal woodlands and marshes is significantly later by about 2000 years than those from the larger exposures on the western sides of Carmarthen Bay at Marros Beach. This highlights the need for more dates from both the eastern and western side of the Bay to see whether there are specific, localised explanations in the persistence of a coastal barrier for the fen-carr

coastal vegetation at Morfa Bacas and also demonstrates the potential that a larger suite of radio-carbon dates might have for the micro-topography of sea level changes within an area like Carmarthen Bay. These peat shelves are alternately covered and exposed by movement of sediments and are a fragile, finite and vulnerable resource whose potential for study of sea level changes is far from exhausted.

A shell midden at Morfa Bacas, possibly contemporary with at least the later stages of the peat shelf environment, contained the skull of a roe deer, as well as cockle and mussel shells giving an idea of the range of food available in the later prehistoric period and hints at a continuation of hunter-gatherer life-styles and economies. The precise position of shell middens that can range in date from the prehistoric to the medieval periods and indeed beyond, is often significant in indicating the strand-line at different periods, particularly over the eastern half of Carmarthen Bay where the natural processes of sand dune accumulation and long-shore drift have been accelerated by enclosure of land from the sea to create large areas of new land.

In sum, it is evident that the massive accretion that characterises much of the present coastal zone of the eastern side of Carmarthen Bay has buried or masks earlier shorelines. Any localised erosion or intrusive excavation therefore could well reveal early prehistoric land surfaces and with them sites or finds.

LATER PREHISTORY: 800 BC - 75 AD

The defended Iron Age sites in coastal locations over the eastern side of Carmarthen Bay differ in form, and perhaps in their early origins from the standard 'coastal promontory' cliff top sites of the Pembrokeshire coastline (Murphy & Allen 1997). Whilst this perceived difference may partially be a reflection of which sites have or have not been excavated, there is no doubt that Coygan camp, as well as the Iron Age hillfort that underlies Llansteffan Castle and the fort at Garreg Llwyd above Pembrey were well sited to control coastal grazing. Smaller Iron Age defended sites are rarer on the coast of this area - Glan-y-Mor, Laugharne being an exception.

ROMAN AND EARLY MEDIEVAL 75 - 1093 AD

The R. Tywi (*Tovius*) is thus named in Ptolemy's mid 2nd century *Geography*, the Welsh coastal entries are thought to derive from late 1st/early 2nd century information from the Roman fleet engaged in reconnaissance in advance of invasion as well as later coastal operations. Roman occupation of the area began with military conquest and the establishment of forts at both Loughor and Carmarthen in the campaign of Julius Frontinus, AD 75. It is thought likely that both forts may have been secured by a pincer movement of overland armed forces and sea borne troops. Supplies too were probably brought in by sea. It is important to appreciate that in the first century AD all the four estuaries of Taf, Tywi, Gwendraeth and even the Loughor were more open to the sea, their approaches nothing like as encumbered by sand bars and dunes as today. Although outside the survey area for this Report which is confined to the present day coastal strip, the most interesting and as yet unresolved problem of the line of the Roman road from Loughor to Carmarthen is where the Gwendraeth was forded or bridged. The crossing point, and indeed access from the sea could be in the Spudder's Bridge area, now many miles inland. A fort or base in the Kidwelly area is a

possibility. Coastal trading in the Roman period for the western side of Carmarthen Bay is evidenced by the distribution of Preseli phyllite slates in south east Wales, probably returning as ballast. Waste from shaping phyllite slates was found as part of the makeup of the 2nd century Roman legionary quays at Caerleon. The most likely export point would be Saundersfoot/Amroth/Wisemans Bridge beaches. Imported pottery of 2nd to 4th century date from the Roman town of *Moridunum*, that succeeded the Roman fort at Carmarthen must have come in by sea together with the materials that it contained.

Individual coin finds particularly in beach locations *may* indicate possible offshore wreck sites - but equally may be casual losses or even modern losses. Whilst ships were probably wrecked in the Roman period as well as succeeding centuries it is highly unlikely that any traces could have survived the sand movements and accumulation of Carmarthen Bar. First century coins are reported from the river bed below Carmarthen Bridge, the foreshore at Scott's Bay, Llansteffan (PRNs 14683; NGR SN 345 096 - map 2) and a fourth century coin from the Salmon Scar, Ferryside (PRN 11304; NGR SN 3608 0729 - map 14).

For the so-called 'Dark Ages', the archaeological evidence in the form of 5-7th century eastern Mediterranean and Gaulish pottery, glass and Byzantine coins is from the western side of the Bay indicating trade, high status site(s) at or near Tenby and an early monastic foundation on Caldey. As yet no comparable material has come from the eastern side of the Bay or the estuaries although there are grounds for believing that occupation continued in 5th and 6th century *Moridunum* (Carmarthen). Material evidence for the 9-11th centuries is equally sparse although possible Viking material is attested from the shell middens of Laugharne Burrows. According to the Welsh Chronicles, Viking fleets used the Burry Estuary for overwintering (Lloyd 1935).

THE NORMAN INVASIONS

The late 11th and early 12th centuries saw major changes in west Wales - a divided Wales was open to attack by Norman adventurers who used estuaries and rivers first as a means of establishing fortified bridgeheads then of securing their new conquests with castles. They went on to exploit the economic resources of the land by establishing boroughs with privileges and near-monopolies in trading for their Norman, English, Flemish townsfolk. The study area, especially the three estuaries of the Taf, Tywi and Gwendraeth with the earthwork and later stone castles of St Clears, Trefenty, Laugharne, Llansteffan, Carmarthen, Kidwelly, and earthwork castle sites at Llanelli, and Loughor in the Burry inlet provide a classic example of the processes of conquest, with much of the evidence well preserved (Avent, 1991). The precise location of the earliest site of all - Rhydygors, established in the 1090s - is not known but it probably lies beneath the mid 19th century railway embankment just south of Carmarthen. Some of the wharves or quays of the castles close to the rivers are possibly subsumed within later structures; in other cases, such as the Gwendraeth Fach below Kidwelly, silting at the river mouth and changes in the estuaries meant that later quays and docks were constructed further down river, with the possibility of medieval structures surviving as buried traces. The study area has tremendous potential for further detailed work on the location and survival of early quays and wharves.

MEDIEVAL & LATER TRADE

It is important to realise that Carmarthen was the among the largest, if not the largest town in Wales from the Middle Ages up to the early 19th century when it was rapidly outstripped by the booming industrial towns of south Wales, and more locally by the end of the century Llanelli. Its first quay was built in the 16th century, but Island Wharf continued into use until the 19th century (James 1980). Carmarthen had a deep-sea as well as a coasting trade from the middle Ages. Like the other Castle boroughs of Kidwelly, and the more minor lordships of St Clears, Laugharne and Llansteffan medieval records attest to imports of wine and salt from Gascony and the Baie de Borgneuf, as well as trade with Spain and Portugal and beyond. These have left little physical trace in the waterfront archaeology of the Taf and Tywi rivers area, where the traces of the later 19th century coasting trade are everywhere. In the lower Gwendraeth and in the Burry Estuary there is still a wealth of evidence for quays, harbours and docks that were principally constructed to handle the coal export trade, dating from the 18th century through to the 20th century.

FORDS & FERRIES

The rivers were important arteries for supply of garrisons and in peaceful times for a developing trade. Physical evidence for this in waterfront or river bank locations is sparse and to date all known wreck sites have been from later centuries. Where historical and physical evidence come together is in the sites and structures of the numerous fords and ferries that crossed the rivers at several points. Surviving features - high and low water landing slips and embarkation points tend to be from the latest periods of use - the main ferry from Ferryside to Llansteffan and from Ferry Point, Pentowyn to Laugharne was in use until the early 1950s. But historical evidence, together with stray finds, supports a long history. The Llansteffan ferry route was one of the main routes into west Wales, used by king, pilgrim and merchant alike. A find of Anglo-Saxon coinage attests to pre-Norman use. The casual find of a bronze socketed axe at Ferry Point hints at early prehistoric use of the river. Low tides and low water levels can reveal the causeways of fords and ferry points - notably the Upper Crossing from below Cwm Celyn on the Taf across to Delacorse and thence to Laugharne. Mary Curtis, the Victorian historian of 'Laugharneshire' describes how the causeway there supported lime carts transporting material from the Coygan quarries (Curtis 1880, 159).

RIVER TRANSPORT & THE RAILWAY

The small areas of exposed limestone throughout the survey area have been quarried for building stone and for limeburning. As with other areas of the west Wales coast, any landing place or creek had its limekilns, for this was the principal fertiliser from the 16th to the mid 19th centuries. Transport of bulk cargoes by sea and river was always easier than carts on the poor quality inland roads. A remarkable relict example of this system is the tramroad to the small quay at Railsgate Pill - the main route out for Coygan Quarry's limestone.

If only as a physical feature, Brunel's railway is a dominant feature of the study area. From Llanelli across Burry Port and Pembrey Flats it cut off former creeks from the

sea and radically altered the landscape, becoming a 'hard-edge' coastal defence in its own right. Securing the railtrack from Ferryside on the east side of the R. Tywi up to Carmarthen continues to demand defence works and bank armouring. The remains of Brunel's wooden Railway Bridge and its replacement iron 'Bascule' Bridge vividly demonstrate the 'terrain oblivious' nature of the railways - the rivers and estuaries were now but obstacles to be crossed, no longer routes in their own right.

Robin Craig, the leading economic historian of Carmarthenshire's maritime trade, highlights two key factors that help understand the nature and location of the archaeological traces of that trade. Much of the industrial effort was pioneering, but it was also small scale and undercapitalized and beset by 'chronic individualism'. Pioneering - early canals (Thomas Kymer) and railways (one of which was only the second in the world needing an Act of Parliament; individualistic - no less than eight small canals between Pembrey and Penclawdd, no less than five separate docks at Llanelli, one being the first dock in Wales another the first enclosed Wet Dock (Craig 1986). The canals and tramways and then the railways of the lower Gwendraeth Valley and the Burry Port Llanelli areas were vital in bringing coal from the coal pits and mines to shipping places, quays, harbours and docks - in a word the maritime trade could not develop without them. But in the rivers and estuaries of the Taf and Tywi the arrival of the railway in the mid 1850s dealt a blow to coastal and deep sea trade. It was not quite the death knell because small scale coasting trade carried on until the 1920s and 1930s, but the bulk agricultural and mineral products were now moved by rail wherever there was a railhead. St Clears is a striking example of how the focus of a settlement could shift in response to such commercial pressures; the heart of the modern town being closer to the railway and Lower St Clears a backwater. At least from the archaeological point of view, some, if not all of its maritime infrastructure - quays, warehouses, sites of brick kilns and limekilns have survived.

CARMARTHEN BAR, NAVIGATION & SHIPWRECKS

"Sins the haven [of] Vendaith Ve[han] decaied, the new toune is sore [de]caied. Cairmardine [ha]tth incresid sins Kidweli Havin decaied. . The se flouith by Vendreth Vehan, flouith apon half a mile above the town of Kidwelley. Bothe Wendreth Vaur and Vehan goith into the se about a mile beneth the toune, al only a litle nesch of sand dividing their mouthes. Ther lieth a long on eche side of Wendreth Vaur pittes, wher menne digge se coles. At Llanethle, a village of Kidwelli lordship, a vi miles from Kidwelli, the habitans digge coles, elles scant in Kidwelly land. Ther be ii maner of thes coles. Ring coles for smith be blowid and waterid. Stones coles be sumtime waterid, but never blowen, for blowing extinguishit them. So that Vendwith Vaur coles be stone coles; Llanethle coles ring colis.

The Severn Se at ful water betith on the point of Llanstufan. At low water it is ii. good miles of. At ful se Tave semith to cumme as it were to the mouth of Towe River, but at low water marke a man may perceive how it ha[steth] to the se on the sandis hard by Towe. Llanstufan is v. miles from Cairmardine, and about a ii. miles above Llanstufan on the same ri[pe] is a place or clif caullid Grene Castel, wher that shippes used to ly at ancre. Smaul balinggers ot[her] wise cum to Cairmardine. Beyond Llanstephan before the havin mouth liith a barre, so that shippis lighteli cum not in [with]owt a pilote.

(Leland's Itinerary, ed. L. Toulmin-Smith III, pp 59-61)

This remarkable description by the Tudor traveller, John Leland, of the differences between the anthracite and bituminous coal also provides us with invaluable evidence of the developing problems of silting of the estuaries and formation of sand bars. The high tidal range is also a dominating feature in the Bristol Channel as a whole. Even in the 1530s large vessels could only get up to Carmarthen Quay once a fortnight on high tides and the same situation prevailed, to a greater or lesser extent across the whole study area. Anchorages and neap tide loading and off loading points, also ballast banks must all be looked for and identified in the archaeology of the estuaries and can only be fully appreciated when the difficulties of handling vessels under sail alone are considered. The whole maritime history of south east Carmarthenshire is dominated by constant attempts to cope with these problems that caused increasing difficulties to navigation, and also made it difficult to provide berthing for the larger ships of the second half of the 19th century. The history of navigation can only be appreciated in detail with the appearance of marine charts and sailing directions from the later 18th century onwards. Some surviving navigation marks may go back to the early 19th century, whilst others are later. The history of the navigation is littered with numerous schemes - generally far too expensive - to improve channels by new cuts, training walls to scour the rivers and new harbours and floating docks. Few were built but the archaeological evidence of training walls on the south side of the Salmon Scar designed to improve the lower Gwendraeth are physical testimony to the problem and attempted solutions.

Far more obvious evidence to the failure of navigation and the dangers of Carmarthen Bay are the numerous shipwrecks - many known only from documentary sources, but others exposed between tides, especially off Cefn Sidan. A Lifeboat station was built at Ferryside in 1852 and closed in 1964; the building and its slip are now used by the local yacht club. There was also a Victorian Lifeboat Station at Burry Port, still a feature of the Harbour although only a 'D' class inflatable is in use today for inshore pleasure boat users that get into trouble. The *Paul* and the *Teviotdale* are two well known wrecks off Cefn Sidan. Fieldwork and recording resulting from an earlier Wetlands survey, partly subsumed within this Coastal Survey format, highlighted the potential for wrecks on the foreshore of Cefn Sidan beach (Page 1997b). This coastal survey has identified wrecks of vessels laid up once trade declined and left to rot. One such is that of the *Sarah* (PRN 30099 - map 7) at Pilglas. She was a 'coal boat' of 50 tons, owned by Mr John John of The Green, Llansteffan and laid up in the 1920s. These were the last coastal traders, delivering loads of coal from Kidwelly to farms in the Taf and Tywi estuary and river, taken off by cart (Rees, 1985).

LAND WON FROM THE SEA

The large areas of Laugharne Marsh and the landward sides of Cefn Sidan are most obviously land won from the sea; the physical stages of enclosure of the saltmarshes sheltered behind the ever-developing sand spits of Pendine and Cefn Sidan are only partly encompassed within the parameters of the pan-Wales Coastal Surveys. The history of their enclosure is covered elsewhere (James 1991; James 1993a & b; James and Morgan 1994; Page 1996; Page 1997). But within the estuaries particularly in the Taf below Trefenty are remarkable survivals of early reclamation of saltmarsh. The complex on the eastern bank of the Taf below Trefenty and on the lower banks of its

tributary the Cywin merit more detailed study. They are clearly of at least two phases of build. The earliest can be linked to the later 1670s (Evans 1975, 16). The now much eroded banks below Carmarthen may also be 17th century or even earlier in date.

FISHING & SHELLFISH GATHERING

Almost by definition the physical traces of coastal and estuary fishing are slight and ephemeral unless sealed in later silts, mud or sand. The distinctive fishing techniques - and craft - of Carmarthen and St Clears coraclemen survive by a thread at the end of what could be 2 millennia at least of their practice. Each estuary too has its traditions of netting - the seine netmen of Llansteffan and Ferryside, the wade netting of Laugharne. Shellfish - particularly cockles - have been, and still are, harvested from all the estuaries (Jenkins, 1991). Evidence for fish traps and fishweirs is coming to light, and more will be discovered through fieldwork. A stone fish-trap visible on Salmon Scar in the late 1980's is now once again besanded. The fishweirs or *goredi* noted in medieval and later sources are difficult to tie in precisely with surviving physical remains. Silting at the estuary mouths must have buried many.

DEFENCE

There are many surviving military structures and installations within the area, including Pembrey Airfield, a large number of pillboxes, beach defences and anti-tank cubes. Perhaps one of the most interesting military sites is the wreckage of a Wellington Bomber (PRN 31379; NGR SN 3778 0528 - map 15) which crashed into the saltmarsh north of Pembrey Airfield during a training flight in 1945. The airfield was opened in May 1940 as a fighter station, but by June 1941 it had become home to 1 Air Gunnery School (*Action Stations*, vol.3). Since being decommissioned the airfield has been used as farmland and more recently the southwest end has become the Welsh Motor Sports Centre. A recent report suggested that one of the old runways could be reopened as a commercial airfield (*South Wales Evening Post* 31/1/96), although it is unclear how that could be achieved given the amount of military flying over the Pembrey Sands Air Weapons Range immediately north of the airfield.

The vast open expanse of Cefn Sidan Sands was a potential invasion point, so a series of beach defences (PRN 31409; NGR c.SN 3790 0060 - map 16: PRN 31413 NGR SN 3500 0500 - map 15) and gun emplacements (PRN 31376; NGR SN 3774 0260: PRN 31414; NGR SN 3707 0352: PRN 31415; NGR SN 3724 0326 - all map 16: PRN 31380; NGR SN 3650 0454 - map 15) was established to protect this vulnerable area. Backing up this system was a strategic stopping point, a Command Stop Line comprising many pillboxes, anti-tank cubes, a lookout and other structures. The Command Stop Line extends from Pembrey in the south to New Quay, Cardigan Bay, in the north (Saunders 1989, 216; Glover 1990, 82-83).

Other major defensive lines were established along the sea wall (map - 18) north of the airfield and along the dunes west of Pembrey Harbour (maps 17 and 19).

DESIGNATION OF ARCHAEOLOGICAL IMPORTANCE

All sites within the study area have been assigned to a category of importance in order to allocate a value to each site. That value determines the archaeological significance of each site. The categories are those outlined in the *Design Manual for Roads and Bridges* (Department of Trade 1993, vol 11, Section 3, part 2) and are listed below.

Category A - Sites of national importance

Scheduled Ancient Monuments, Listed Buildings and sites which meet the criteria for scheduling or listing. It is recommended that category A sites are preserved *in situ*.

Category B - Sites of regional or county importance

Sites which do not quite meet the criteria for scheduling or listing, but which are of particular importance to the region. Preservation *in situ* shall be the preferred option for Category B sites, but where damage or destruction is unavoidable appropriate action will be taken.

Category C - Sites of district or local importance

Sites which are not of sufficient importance to justify preservation if threatened. Category C sites merit adequate recording prior to damage or destruction.

Category D - Minor or damaged sites

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

Category E - Sites needing further investigation

Sites whose importance cannot be determined without further investigation in order to assign them to Categories A-D. These sites will be subject to field evaluation.

SITE CONDITION

One of the criteria used in assigning site values was their condition. The classification used throughout the Dyfed coastal survey is that used in the regional SMR. Seven categories are used.

A - Intact

B - In good condition

C - Damaged

D - Badly damaged

E - Destroyed

R - Restored

U - Unknown

Sites only known through finds have been assigned to the U - Unknown category.

RECORDING THE COASTLINE

For survey purposes the coastline was divided into four main categories, which were sub-divided into further categories for recording. The categories used are those devised by the Gwynedd Archaeological Trust (GAT 1995).

The four main categories are: Coast edge type

Land edge type

Foreshore type

Erosion class

Coast edge type:

Man-made wall

Man-made bank

Man-made mixed rubble dump

Man-made boulder dump

Man-made other

Mainly rock

Rock with drift cover

Drift, boulder clay

Drift, blown sand/sand

Alluvial/marine mud

Storm beach (storm bank)

Other

Land edge type:

Man-made structures

Arable

Improved pasture

Scrub/heath/rough pasture

Coppice woodland

Golf course

Military

Dunes

Other

Foreshore type: Rock
 Boulder
 Shingle
 Sand
 Mud
 Marsh
 Mixed
 Other

Erosion class: 1. Stable - No erosion. Some accretion. Man-made protection*.
 2. Slight - Some soil exposure, but good vegetation cover and post-medieval boundaries intact.
 3. Medium - Widespread soil exposure, intermittent slumping. Post-medieval boundaries mainly gone.
 4. Major - General soil exposure, frequent slumping, little vegetation, no post-medieval boundaries.
 5. Severe - Widespread slumping, no vegetation, recent boundaries undercut.

**Erosion class 1. Stable differs from the original GAT definition by including the possibility of accretion and the presence of man-made protection.*

PLANNING AUTHORITIES & MANAGING AGENCIES

Coastal and Estuary management is notoriously complex, with many authorities and agencies involved. Not only are there many Acts of Parliament and government guidances applicable to the coast but also EU Directives are increasing, to the point where there are very few coastal, estuary and riverine activities not subject to some kind of regulation or advice. Not surprisingly therefore coastal zone management is often fragmented. Considerable effort is currently being expended on integrating coastal zone management and this requires a great deal more liaison and understanding between the bodies and users involved (University of Wales, Cardiff 1997).

The archaeological, and indeed the whole historic environment resource, is managed through a variety of authorities and agencies - Cadw-Welsh Historic Monuments, being the lead body. Cadw funds the 'curatorial' sections of the Welsh Archaeological Trusts to provide information and advice on all aspects of archaeology and planning. Archaeologists are concerned that the historic environment - and the historic coastal environment is no exception - is not accorded the same 'over-arching' attention as the natural environment and its interests are therefore often fragmented and relegated down lists of specific topics. In fact the historic and the natural environments are inseparably inter-connected. It is hoped therefore that the information in this Coastal Survey, as well as its predecessor 'wetlands surveys' for Llanelli and Loughor marshes, and for Kidwelly and Pembrey (Page, 1996; Page 1997) will help to rectify this imbalance. A series of Recommendations are made below to help this process of recognition take effect.

CADW: WELSH HISTORIC MONUMENTS

Cadw - Welsh Historic Monuments is an Executive Agency within the Welsh Office carrying out 'the complete range of responsibilities for the conservation, presentation and promotion of the built heritage of Wales on behalf of the Secretary of State. The principle framework legislation is the 1979 Ancient Monuments and Archaeological Areas Act. Cadw directly administers guardianship sites of which the castles at Laugharne, Llansteffan and Kidwelly are prominent examples in the survey area, and administers the Schedule of Ancient Monuments. Cadw funds the 'curatorial' sections of the Welsh Archaeological Trusts to provide information and advice on archaeology to Local Authorities and other bodies. Cadw grant aids excavations and surveys, of which this Coastal Report is one example.

In 1998 Cadw, with CCW and ICOMOS published a *Register of Landscapes of Outstanding Historic Interest* in Wales. This is an advisory, non-Statutory Register 'compiled in the firm belief that by providing information and raising awareness of an initial selection of historic landscape areas in Wales . . . due consideration of their conservation . . . alongside other conservation issues . . . can be achieved. The Taf & Tywi estuaries form one such landscape.

ROYAL COMMISSION ON ANCIENT & HISTORICAL MONUMENTS WALES

RCAHMW is the national body charged with survey and record of the built, historic environment. It maintains the National Monuments Record. Although the full scope

of NMR collections of records, plans, photographs and other material has not been exhaustively scanned for this rapid Coastal Survey it is known that the NMR contains detailed records for the industrial history and archaeology of the Kidwelly/Burry Port and Llanelli area. RCAHMW also grant aids the *Sites and Monuments Records* maintained by the Welsh Archaeological Trusts and a data exchange agreement (the Extended National Database - END) allows access to core data within all these records across Wales.

In 1994 a new maritime section of the NMR was established following the extension of RCAHMW's remit to the territorial seas. To date however, lack of funding has precluded the carrying out of a full record of all known wreck sites off the Welsh coasts. Those covered in this rapid survey relate only to sites of the foreshore or in inter-tidal locations, not marine wrecks.

COUNTRYSIDE COUNCIL FOR WALES

CCW was established in 1990 under the Environmental Protection Act Part VII, its responsibilities extend to the seas, shores and coastal areas of Wales. In its 1996 *Seas, shores and coastal areas: Maritime Policy* document there are clear statements that 'cultural heritage' forms part of their protective remit. Map 3 of the document shows the Historic Landscapes in the Maritime zone and this includes the Taf and Tywi estuaries and Cefn Sidan (See Historic Landscapes Register under Cadw, above). The importance of the natural environment of the coastal zone of Carmarthen Bay, the estuaries and the Burry Inlet is amply demonstrated in the amount of statutory designations. There are SSSI's on Laugharne and Pendine Burrows, Craig Ddu and Wharley Point Cliffs, Llansteffan, on the Pembrey Coast, encompassing the intertidal and saltmarsh areas of Cefn Sidan and the Gwendraeth estuary and the large Burry Inlet and Loughor Estuary. The latter area is designated a Wetlands of International Importance under the Ramsar convention of 1971. Work is underway to implement the designation of the Tywi Valley as a Special Area of Conservation (SAC) under the EC Habitats and Species Directive. There is a Local Nature Reserve at Pembrey Burrows adjacent to Pembrey Country Park.

The plethora of designations for habitats and wildlife could, with effective consultation and liaison, be used to provide an umbrella of protection for archaeological sites and the historic environment. Statutory designations that protect large areas are obviously a benefit in protecting the archaeological sites they contain, but it must be acknowledged that within those areas there could be conflicts of interest between nature and archaeological conservation concerns. At a District level good contacts are maintained between Trust archaeologists and CCW officers; CCW has in the past funded historic landscape research to assist in its objectives - for example (James 1993b).

CARMARTHENSHIRE COUNTY COUNCIL

The whole of the coastline covered in this survey is now within the new unitary authority of Carmarthenshire County Council. The Authority is involved in the coast and estuaries in a number of ways all of which have the potential to protect and enhance - as well as degrade or destroy the archaeological resource.

Carmarthenshire County Council as Planning Authority

The Curatorial Section of Dyfed Archaeological Trust provides information and advice on the archaeological implications of planning applications within WO Planning guidance parameters. This is principally effected by scanning of weekly lists of applications against the regional archaeological *Sites and Monuments Record* maintained by the Trust. The Authority has adopted, by resolution of Council, the Carmarthenshire section of the SMR as its archaeological record for planning purposes. Local Plan policies from the former Carmarthen District Council and Llanelli Borough Council on archaeological sites were developed from Dyfed County Council's Structure Plan Policy EN1A. In essence no development is permitted to adversely affect Scheduled Ancient Monuments and there is a presumption in favour of preservation for unscheduled sites. There is no difference in the treatment of inland and coastal sites and features in this essentially reactive consultation and advice procedure from the Trust to the Planning Authority.

Carmarthen Bay Coastal Area and the entire length of the Tywi Valley were designated as a Special Landscape Areas under policy EN3 of the former Dyfed Structure Plan. In Special Landscape Areas priority is given to the conservation and enhancement of the landscape. Carmarthen District Council's deposit draft plan notes that : 'The boundaries of the Laugharne and Llansteffan Conservation Areas include the coastal areas which form the setting of the villages. There is a close relationship between Carmarthen District's coastline and the estuaries and rural landscapes which extend inland from the coast . . the Council's approach is to give priority to the conservation of the undeveloped coast'. Llanelli Borough Council's Local Plan area covered part of the Carmarthen Bay Special Landscape Area with Cefn Sidan sands down to Pembrey

To the east of Pembrey on the northern shores of the Burry Estuary, the coastline has been massively affected, indeed shaped, by human action principally though the heavy industries of coal and metal working and the transport and port infrastructures related to them. Here there is a strong emphasis on nature conservation (see CCW section above) and also on economic and urban regeneration following the decline of heavy industry.

CARMARTHENSHIRE COUNTY COUNCIL: DEPARTMENT OF ECONOMIC DEVELOPMENT & LEISURE

This department is involved in activities, programmes and schemes relating to the coast at many levels and in many locations. In the Authority's *Service Delivery Plan 1996/97*, under the department's 'issues' section it is interesting to note the view that 'given general and EEC based environmental pressures . . Council will come under pressure to formulate a Coastal Zone Management Plan'. Within the many development, regeneration, tourism and leisure schemes and activities that the Department has oversight of the following may be singled out:

The principal scheme affecting the whole of the coast of the eastern part of the county is the **Millenium Coastal Park**, now under a separate director. This is an extremely ambitious project, already well under way, which involves wholesale remodelling of

parts of the coastal landform and extensive development for residential, light industrial and wildlife facilities. The scheme is implemented through 5 separate planning permissions and it is a matter of concern that there was no overall, archaeological appraisal in the Environmental Statement that involved an up-to-date condition survey. The Department also administers the **Pembrey Country Park** which is a large and heavily visited site with the primary attraction of Cefn Sidan Sands. Part of the park's attractions however also include walks and wildlife interest in Pembrey Forest, administered by Forest Enterprise. This present Coastal report summarises a more exhaustive 'audit' of the archaeology of the Pembrey Country Park and its environs in the first of the two Wetlands' Reports carried out by DAT (Page 1996). Through administration of the County's **Museums and Heritage Centres**, as well as through the programme of **Coast and Countryside Walks**, with their accompanying leaflets and interpretation panels, information on the maritime heritage of the county and its surviving coastal archaeology is being made available.

CARMARTHEN BAY COASTAL ENGINEERING GROUP

This group is chaired by R.P. Thomas, Director of Highways, Technical and Property Services, City and County of Swansea with a secretariat from Carmarthen County Council's Planning, Property and Technical Services Department. CCC are the lead Authority. The Group is charged with the preparation of a **Shoreline Management Plan** for Carmarthen Bay from St Govan's Head, Pembrokeshire, to the east Helwick Bank, off Worms Head, Gower including the whole of the Burry Estuary. As will be seen from the inclusion of the relevant coastal cell classifications in the Welsh Office General Level Survey included in this Report as Appendix 1, the Cadw Coastal Reports have been primarily seen as providing base-line data for these SMPs. Consultants charged with the production of the Carmarthen Bay Shoreline Management Plan are the Shoreline Management Partnership and issue of Stage 1 of the plan is imminent, which incorporates some but not all of the base-line archaeological data, since it was well advanced even as the Cadw Surveys were getting underway. An SMP sets out a strategy for Coastal Defence.

The joint MAFF/WO guides to SMPs have been criticised for insufficient attention to archaeological and historic coastal environmental concerns, but in Wales attendance by the Welsh Archaeological Trusts' curatorial staff at Coast Defence Group meetings and the production of the Cadw Coastal Surveys is helping to raise the profile of the historic environment. The next stage will be to consider the archaeological implications of future proposed strategies for coastal defence. It has not been possible in the past to evaluate or monitor most coast defence works for their archaeological impacts.

It is also hoped that any future symposia of the Burry Inlet and Loughor Estuary Liaison Group - a broad-based group of local authorities, agencies and conservation bodies - will include the historic environment interests.

THE ENVIRONMENT AGENCY

Formed in 1996, the agency 'is one of the most powerful environmental regulators in the world'. To the statutory duties of the NRA (National Rivers Authority) have been

added powers to control pollution, waste and air quality. Amongst all these duties Section 7(c) of the Environment Act 1995, charges the Agency 'to have regard to the desirability of protecting and conserving buildings, sites and objects of archaeological, architectural, engineering or historic interest'. In 1994 the then NRA carried out an R & D project on 'The NRA & Archaeology' to 'review the duties of the NRA to archaeology'. 'There was a recognition that the appropriate scale for the mapping of archaeological information in a form useable by EA and contract staff might be the River Corridor Survey and a sample proposal was supplied by Dyfed Archaeological Trust for the R. Cywyn, a tributary of the Taf, within this Report area. Summary statements that characterise the Catchments' riverine and coastal archaeology are incorporated in the Catchment Management Plans for the Taf, Tywi and Loughor CMPs. These plans will be extended through LEAPS (Local Estuary Area Plans). It is fair to say that there is scope for greater liaison, consultation and action on archaeological issues between the EA and the Welsh Archaeological Trusts but it must be recognised that despite the wide scope of their responsibilities, their numbers of staff are small. The same is true for the archaeological Trusts. At present the Trust is consulted on operations in the River Management Programme, and there is some liaison over what might be sensitive land drainage consents. The Conservation Access and Recreation section has prioritised actions and targets within the UK Biodiversity Action Plan and pursues its conservation work in partnership and collaboration with other bodies. The promotion of the coastal heritage to a wider public has been improved within the survey area by an EA grant in aid for coastal and riverside walks in Carmarthenshire within this Report area.

NATIONAL TRUST

The National Trust is a significant owner of coastal land within this survey area, with four properties, Tregoning Hill, Ferryside, Lords Park and Laques Fawr, Llanstephan and more recently Pentowyn Farm. There are no specifically coastal aspects to the National Trust's management policies for these properties. The most significant archaeologically is Laques Fawr, with the quarries and limekiln complexes at Culver Cliff. There is no public access to the site at present; it is a long term aim of the Trust to survey the complex and to develop a management plan for the site.

PRESSURES ON THE ARCHAEOLOGICAL RESOURCE.

Archaeologists are in the business of change - and thus recognise that nothing can be preserved unchanged for ever. Without change, decay, erosion and new development there would be no time-depth to the landscape, which is one of the aspects most cherished and valued. In the natural world the concept of sustainable development is being translated into policies and actions through the local Agenda 21 process. Recently English Heritage have formulated ways in which sustainable development is crucial to the management of the historic environment (Ref).

The pressures on the archaeological resource within the survey area of this Report are both general to archaeology in coastal and estuarine environments and also specific to the area. They have been divided into 4 broad groups:

1. Environmental pressures.
2. Water use and management.
3. Land use and management.
4. Developments.

ENVIRONMENTAL PRESSURES.

In the coastal zone these are principally coastal erosion, though accretion too can obscure and bury sites and features. Shoreline Management Plans are intended to establish the best response to rising sea levels and climatic change which might include ideas of managed retreat. Within these processes, sites and features can suffer from simple neglect and decay - unrecognised and unvalued, and thus susceptible to being covered and obscured by vegetation growth. On the northern shores of the Burry Estuary, the submerged forest peat shelves at Pwll (PRN 31318 - map 21) and Morfa Bacas (PRN 31244;31247-31259 - map 22 & 23) are being seriously eroded. These deposits are essentially unstable - a finite, vulnerable and fragile resource. Tidal erosion of sand dunes at the beach head directly affecting significant archaeological sites are most pronounced at the deserted medieval village site at St Ishmael's (Page 1996). River banks and creeks too along the Taf & Tywi are eroding. There is obviously a cyclical movement of sand and sediments that both exposes and then covers shipwreck sites in particular along Cefn Sidan beach (PRNs 14365, 14366 - map 15; 30086, 30088, 31312 - map 16). For these and similar features each 'uncovering' cycle exposes fragile structures and surfaces to further decay, and physical removal. The most marked over the last 2 years has been the wreck of the *Paul* (PRN14365 - map 15). Changes to the shoreline can lead to accretion through the development of salt marsh, the steady degradation in condition and slow burial of the intertidal wreck at Pilglas (PRN 30099 - map 7) is a prominent example.

WATER USE AND MANAGEMENT.

Management of river banks and drainage channels, and land drainage as a whole can all affect the above ground and buried archaeological resource. This can be through ignorance of the existence of sites or features, partly exposed within the channels or on the river banks, or through more or new features being revealed - and damaged or destroyed - through works. Maintenance of river flood and sea defences is obviously

an essential responsibility and there has undoubtedly been loss of information, if not of the structures themselves, when older features - banks, or other kinds of beach or dune management structures are upgraded and rebuilt for continuing service. Armouring of banks is a necessity over long stretches of estuarine or riverine environments to protect the railway line, also industrial or residential developments in low-lying or coast fringe locations (Ferry side for example). Virtually no archaeological recording has been carried out for works to date to record earlier features. Water and sewage treatment works require Environmental Assessments and archaeological mitigation should therefore be built into the development programme and costs - at least in the future, if not wholly satisfactorily in the past.

LAND USE AND MANAGEMENT

Much of the coastal fringe and river banks are in agricultural use; animal erosion and general neglect of earlier sea defences is adversely affecting the condition and integrity of the systems which have not been studied or recorded in detail. There are many breaches along the lengths of these now largely redundant sea or flood defences, either because they are now inland of later systems or because land is reverting to salt marsh. Some sea defensive banks inland of this coastal survey area on Laugharne marsh may be medieval in origin. Within this report area, those at Llanfihangel Abercywin on the Taf and the Cywin are of mid 17th century date and the much eroded banks below Carmarthen bridge, surviving only as isolated lengths, may be equally early. To the east the extensive systems over Kidwelly, Pembrey and Llanelli marshes date to the 18th and 19th centuries.

Although development, even for residential or leisure purposes is tightly controlled over the western part of the coastal area covered by this Report there are significant proposals for the eastern half that involve modification of the landform, new uses of redundant industrial or harbour and dock s at Burry Port and Llanelli for the Coastal Millennium Park which will extend right along the coast from Pembrey Country Park to Loughor. The scheme is so large that it is being implemented through 5 separate planning permissions. Whilst there have been and continue to be consultations on archaeological, historic landscape and cultural heritage features within each scheme component, there must be a concern that the overall scheme impacts - some of which are undoubtedly beneficent, others potentially less so, on the historic environment have not been addressed at the same level as the ecological issues.

RECOMMENDATIONS

GENERAL

This Report will it is hoped be of use to all those involved in coastal zone, river and estuary management in the Carmarthen Bay and Burry Estuary areas. At a general level our Recommendations to preserve, enhance, investigate, record, promote and enjoy the sites, monuments, buildings and maritime heritage features should be implemented through the following actions:

- seek **information** on the coastal archaeological resource
(from curatorial sections of the Welsh Archaeological Trusts, Cadw and RCAHMW).
- evaluate** its importance and the archaeological **potential** of the interest area.
(through information and advice from the above and, if necessary
commissioned surveys).
- assess** the impact of their proposals on the archaeological resource.
- devise** protective or enhancement measures, or **mitigate** against erosion or
destruction, **integrated** within overall management proposals or regimes.
- monitor** the effects of schemes and measures in order to improve future
protection and management

SPECIFIC

Recommendations for scheduling and listing have been made separately to Cadw. As a follow-up to this (and other) coastal archaeological surveys, some **contingency provision** should be made for monitoring the ever changing exposures of submerged forest and shipwrecks in order to respond to threats of imminent erosion or destruction and/or 'windows of opportunity' in the recognition and recording of new sites and features.

Resources should continue to be made available for the **recording of shipwrecks**, possibly in association with the Nautical Archaeology Society, in the provision of training in recording opportunities, targeting the wrecks in the Tywi river and estuary. These are vessels likely to provide information on local boat-building and coastal trading. The following sites are put forward:

PRN	NGR	NAME/ TYPE	MAP No.	THREAT	ACTION
30099	SN 364118	Shipwreck	7	Erosion by every tide	Survey
30105	SN 36551277	Shipwreck	7	Erosion by every tide	Survey
35207	SN 37501260	Shipwreck	8	Erosion by every tide	Survey
35208	SN 37451285	Fishtraps	8	Erosion by every tide	Survey + C14 dating
35210	SN 36561278	Shipwreck	9	Erosion by every tide	Survey
35243	SN 39921640	Shipwreck	9	Erosion by every tide	Survey
31317	SS 54199771	Submerged forest	22	Erosion by every tide	Environmental sampling + C14 dating
31318	SN 48000064	Submerged forest	21	Erosion by every tide	Environmental sampling + C14 dating

Principal themes for future **survey, sampling and recording** within a framework of research and synthesis of data are:

the submerged forests, or peat shelves of Carmarthen Bay and the Burry estuary where **environmental sampling** and a series of **C14 dates** could provide more information on sea level changes in early prehistory, and human use of coastal environments. There is an urgency in that the resource is fragile and vulnerable to erosion.

The previous Wetland surveys for the hinterland of the coastal area of this Report have indicated the potential for past shorelines inland of the present coastline and any **palaeoenvironmental sampling and dating of the submerged forests** should be carried out in conjunction with work inland (perhaps using the opportunities of drainage work and maintenance of drainage channels).

The **recording of wrecks** should be complemented by more **detailed recording** of surviving traces of **wharves, quays, docks and harbours**, to extend and complement survey work already carried out for Burry Port Harbour (RCAHMW - see NMR records). This is 'next-step' data vital for management purposes.

More detailed **planning, recording and historical research** needs to be carried out on **sea defence/marsh reclamation banks**, particularly of the unusual 17th century system on the Taf and the Cywin that is associated with a possibly unique 17th century co-axial field system in Llandeilo Abercywin. New data can be added to previous work to provide a **synthesis and overview of the sea defence and land reclamation** history of the entire Carmarthenshire coastline. Such a synthesis should provide an assessment of the local, regional and national importance of the component areas of land reclamation.

It is recommended that those Authorities and Agencies to whom this Report is circulated **make use** of that information in the planning and management processes and consider whether they should **develop, extend, or recast and re-map** the data in a format and with a level of information directly tailored to their operating and strategic needs - as both constraints and resources. Management Plans include a Management Plan for the forth-coming R. Tywi SAC (CCW), a Local Estuary Area Management Plan (LEAP) (EA), and a Shoreline Management Plan (Carmarthenshire County Council, Swansea City Council).

THE MAPS & GAZETTEER OF SITES

Map 1:

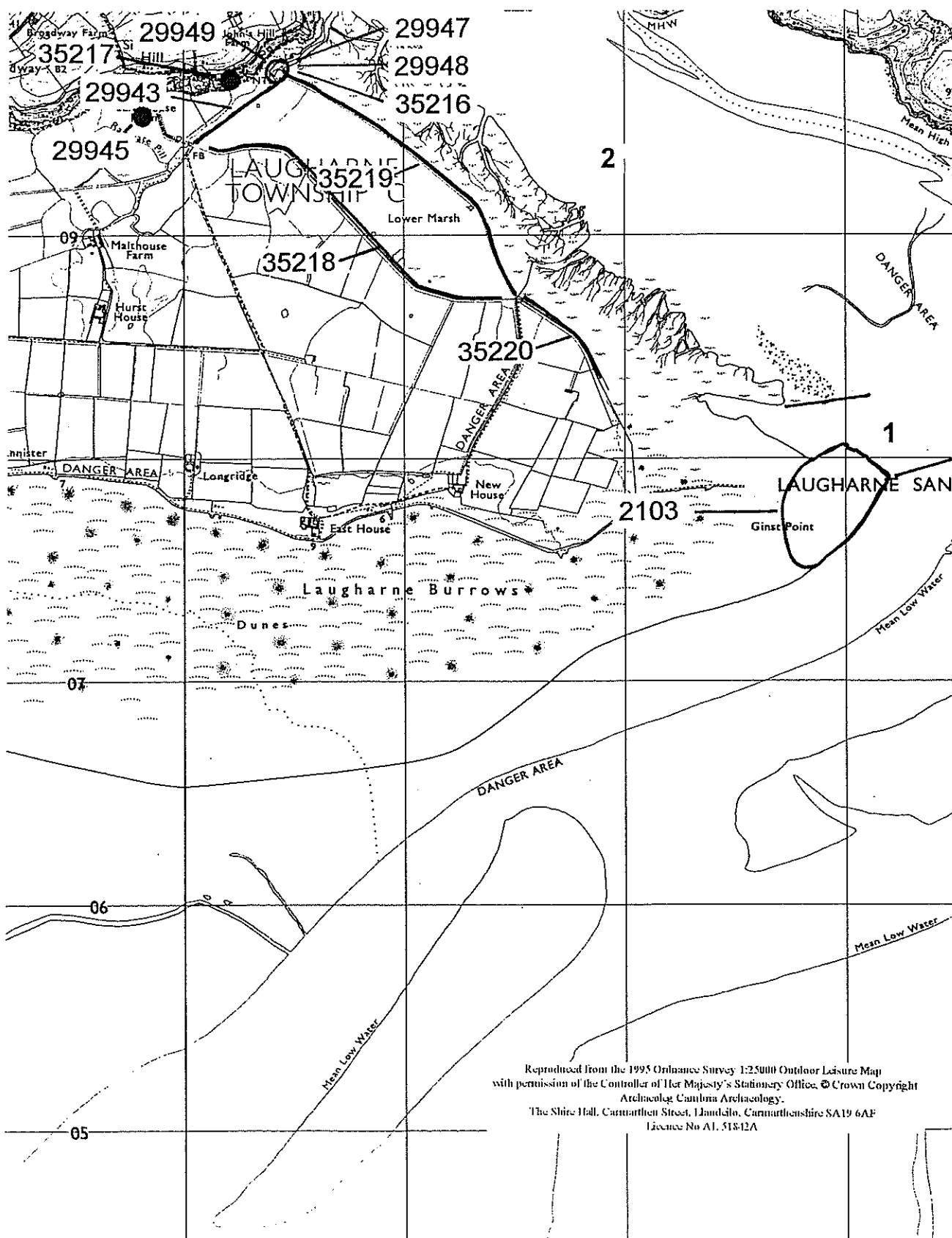
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition		Threats	Action
Importance								
Erosion class								
Status								
2103	SN 329079	Shell midden	Midden	Unknown	U	U	5	
29943	SN 30060940	Tramway	Earthwork	Post Med	D	D	2	
29945	SN 299094	Pump at Salt House	Building	Post Med				
29947	SN 304097	Site of former building	Documents	Post Med	E	D	2	
29948	SN 304097	Jetty	O.Struct	Post Med	D	D	4	
29949	SN 304097	Quay	O.Struct	Modern	D	C	4	
35216	SN 304097	Stone-built single span bridge and sluice. Had wooden revetment on seaward side to channel flow. Commemorative plaque bearing the words: Erected by Tho's Broadwood Esq. 1881.	O.Struct	Post Med	A	C	2	
35217	SN 30350980	The Lees, open field system boundary markers.	O. Struct	Med/Post Med	A	B	1	
35218	SN 30450980 SN 31500872	The Freething sea defence built c.1800-1810 to enclose Lower Marsh	Linear bank	Post Med	A	B	2	
35219	SN 30100937 SN 31450875	Sea defence, ?17th century, replaced by The Freething	Linear bank	Post Med	U	B	1	
35220	SN 31500872 SN 31900835	Sea defence	Linear bank	Post Med	B	B	2	

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
1	0.5km	drift, blown sand	improved pasture	marsh	2	5820
2	3.5km	man-made bank	improved pasture	marsh	2	5820



Map 2:

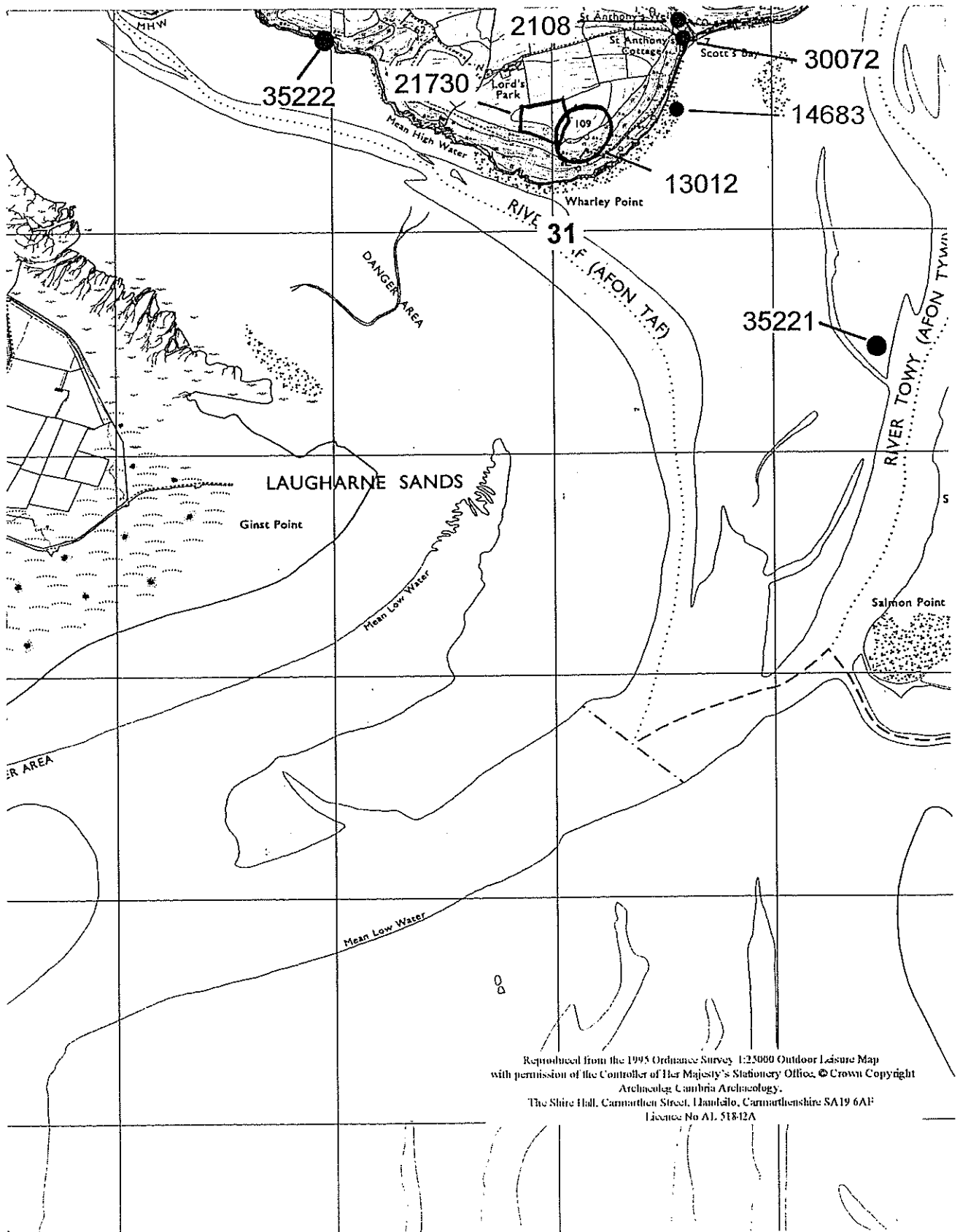
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition			Importance	Erosion class	Status	Threats	Action
2108	SN 34600993	St. Anthony's Well	Holy Well	Medieval	R	B	1					
13012	SN 340094	Curvilinear Bank & Ditch	Enclosure	I.A./Roman	C	B	2				Tourism, a popular walk runs through the bank	Survey
14683	SN 345096	Coin	Finds	Roman	U	U	5					
21730	SN 34000950	Placename - Parc Ffald - shown on tithe map (1840)	Fold	Post Med	U	U	1					
30072	SN 34600986	Dwelling	Building	P.Med/Mod		U	1					
35221	c.SN 355085	Navigation marker	O. Struct	Post Med/Modern	R	B	5					
35222	SN 32900990	Stone and timber low water landing places for ships servicing the lime kilns 29998	Landing place	Post Med	B	B	2					

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
31	4.37km	cliff	pasture	sand	1	5038



Map 3:

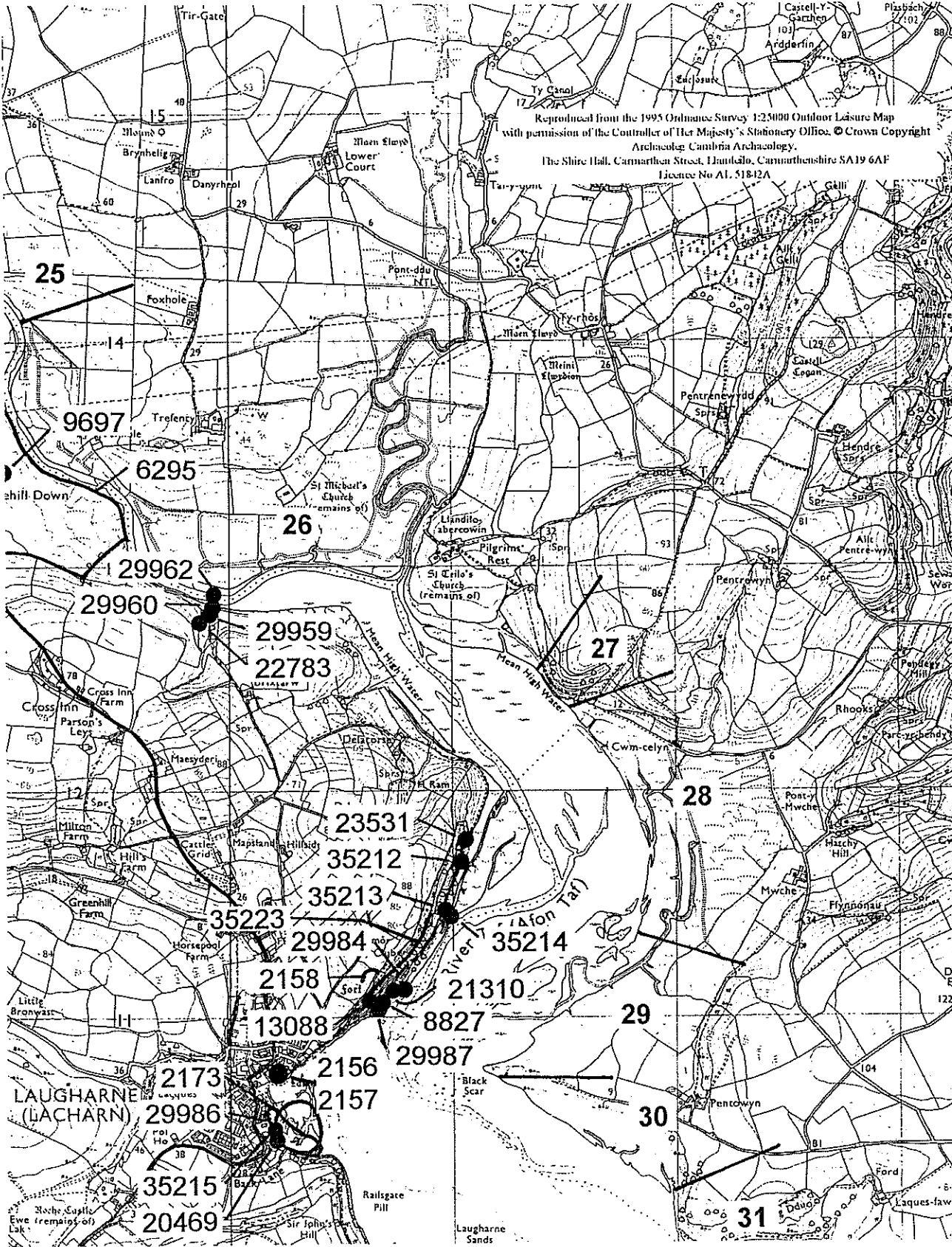
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition	Importance	Erosion class	Status	Threats	Action
2156	SN 30201075	Laugharne Castle	Castle	Medieval	R	A	1	GAM		
2157	SN 30201075	Coin hoard	Finds	Roman	U	C	1			
2158	SN 30631117	Glan-Y-Mor Hillfort	Earthwork	Iron Age	B	A	1	SAM		
2173	SN 303105	Finds	Finds	Neolithic	U	U	5			
6295	SN 290133	Whitemill Moor Strip Fields	Earthworks	Med/PMed	D	D	1			
8827	SN 30671105	Boathouse—Dylan Thomas'	Building	Post Med	A	A	1	LB2		
9697	SN 290134	Whitehill Settlement	Earthworks	Medieval	D	D	1			
13088	SN 30621110	Shell midden	Midden	Prehistoric	U	C	1			
20469	SN 30211047	Lime kiln	Documents	Post Med	E	D	1			
21310	SN 30731112	Ferry House Laugharne	Building	Post Med	C	C	1		Vegetation	
22783	SN 29881275	Cwm Cottage	Building	Post Med	U	U	1			
23531	SN 31031179	Cliff Cottage	Building	Post Med	D	D	1		Vegetation	
29959	SN 29921283	Boathouse, Cwm	Building	Post Med	C	C	1		Vegetation	
29960	SN 29931284	Slipway, Cwm	O. Struct	Modern	A	D	1			
29962	SN 29931285	River Crossing, Cwm	O. Struct	Unknown	D	C	5			
29984	SN 30771112	Slipway	O.Struct	P.Med/Mod	B	C	3			
29986	SN 301105	Area of maritime activity		Unknown						
29987	SN 306110	Laugharne Ferry Wharf	O.Struct	Post Med	B	C	3			
35212	SN 31051170	Stone-Built Rct. Structure. Cottage?	Building	Post Med	D	D	1		Vegetation	Survey
35213	SN 30951145	Retaining Wall, part of 19th century carriage ride constructed along the cliff.	O.Struct	Post Med	C	D	1		Vegetation	Survey
35214	SN 30941140	Cottage, Stone-built	Building	Post Med	D	D	1		Vegetation	Survey
35215	SN 30201035	Slipway	O.Struct	Post Med	D	D	3			
35223		Rock-cut carriage way around cliffs to the east of laugharne Castle	carriage way	Post Med	A	C	1			Survey

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
25	0.37km	alluvial/marine mud	pasture	mud	2	N/A
26	4.5km	man-made bank	pasture	marsh	1	N/A
27	0.25km	cliff	woodland	marsh	1	N/A
28	1.25km	man-made bank	rough pasture	marsh	2	N/A
29	1km	alluvial/marine mud	pasture	marsh	2	N/A
30	1km	alluvial/marine mud	rough pasture	marsh	1	5036
31	4.37km	cliff	pasture	sand	1	5038



Map 4:

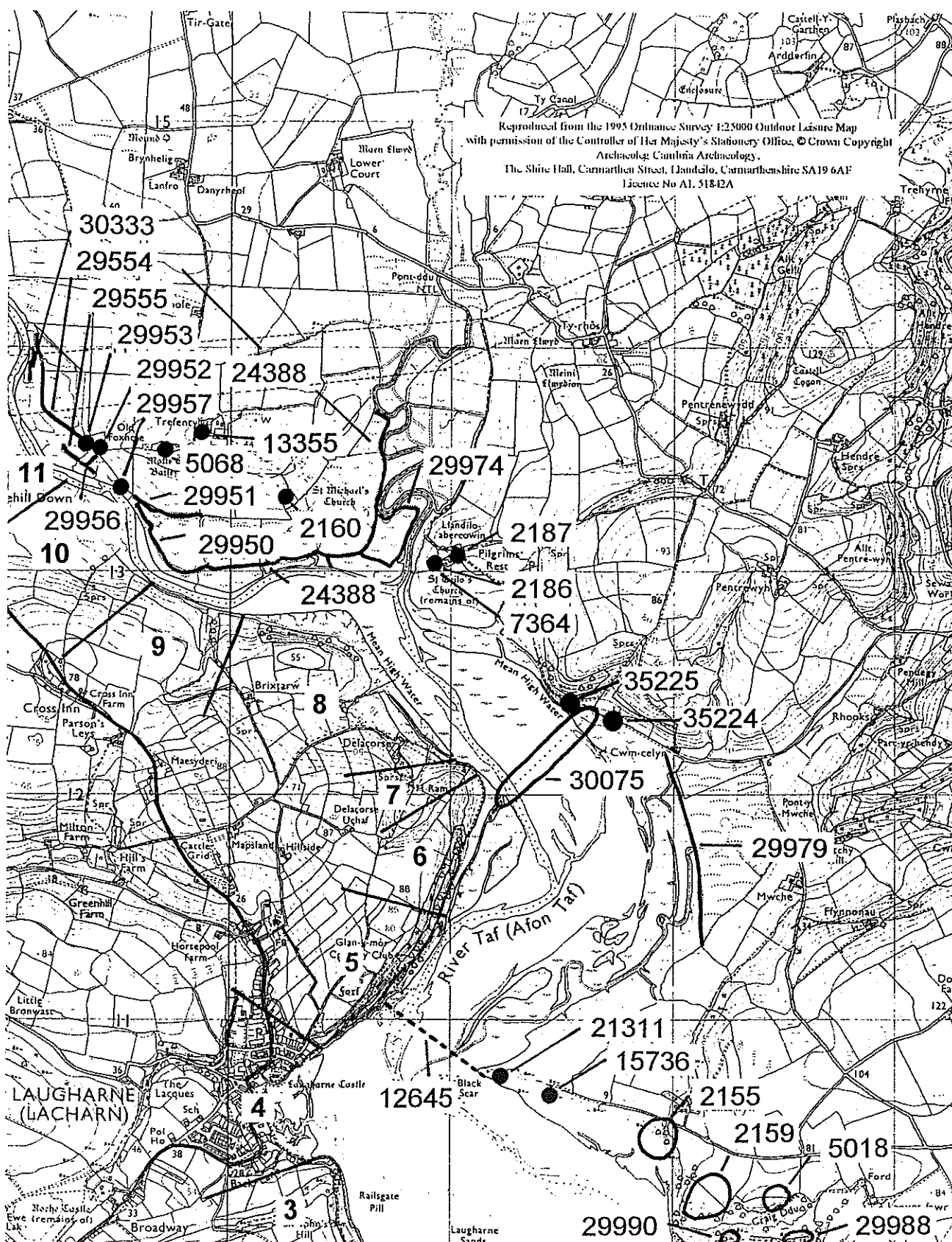
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition			Threats		Action
Importance										
Erosion class										
Status										
2155	SN 31971050	St. Teilo's Chapel	Chapel	Medieval	U	E	1			
2159	SN 322102	Hillfort, Craig Ddu	Earthwork	Iron Age	E	E	1			
2160	SN 30261333	Llanfihangel Abercywyn	Church/Building	Med	D	A	1	SAM	Vegetation	Survey
2186	SN 30931304	St. Teilo's Church	Building	Med/PMed	C	A	1	SAM	Vegetation	Survey
2187	SN 30931304	Tower House	Building	Medieval	R	B	1			
5018	SN 322102	Craig Ddu	Monolith	Unknown	U	E	1			
5068	SN 29681355	Trefenty motte and bailey castle	Mound	Medieval	C	A	1	SAM	Vegetation and animal burrowing.	
7364	SN 30931304	Celtic Dedication St. Teilo Church	Unknown	Unknown	U	E	1			
12645	SN 3010	Llanstephan-Laugharne ferry	Ferry crossing	Medieval	U	D	5			
	SN 3110			Post Med						
13355	SN 29101399	Taf/Cowyn Flood defences	Linear Bank	Post Med	C	C	3			
	SN 29091383									
15736	SN 31481064	Lime Kiln, Black Scar	O.Struct	Post Med	C	C	1		Vegetation	Survey
21311	SN 31231075	Ferry House, Black Scar	Building	Post Med	A	D	1			
				Modern						
24388	SN 2015	Cywyn & Taf Flood Prevention	Bank linear	Post Med	C	C	3			
29950	SN 29711303	Taf & Cywyn Flood Defences	Linear-Bank	Post Med	C	C	3			
29951	SN 29551334	Taf/Cywyn Flood Defences	Linear Bank	Post Med	C	C	3			
29952	SN 29411356	Pump, Old Foxhole	O/Struct	Post Med	E	D	1			
29953	SN 29371358	Shuice/Pond, Old Foxhole			E	D	1			
29954	SN 29131406	Taf/Cywyn Flood Defences	Linear Bank	Post Med	C	C	3			
29955	SN 29111400	Taf/Cywyn Flood Defences	Linear Bank	Post Med	C	C	3			
29956	SN 29241356	Taf/Cywyn Flood Defences	Linear Bank	Post Med	C	C	3			
29957	SN 29451342	Taf/Cywyn Flood Defences	Linear Bank	Post Med	C	C	3			
29974	SN 30581358	Cywyn & Taf Flood Defences	Linear Bank	Post Med	C	C	3			
29979	SN 31961221	Taf Flood Defences	Linear Bank	Post Med	C	C	3			
29988	SN 325101	Lime Kiln	Building	Post Med	U	E	1			
29990	SN 322100	Black rocks, Pond	Pond	Post Med	U	E	1			
30075	SN 3112	Taf River Crossing/Stone & Wood	O/Struct	Unknown	C	C	5			
30333	SN 29101399	Taf/Cywyn Flood Defences	Linear Bank	Post Med	C	C	3			
35224	SN 31721335	Limekiln	Limekiln	Post Med	U	C	3			
35225	SN 31521340	Limekiln	Limekiln	Post Med	U	C	3			

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
3	1km	cliff	pasture	mud	1	5033
4	0.75km	man-made wall	man-made structure	marsh	1	5033
5	1km	cliff	woodland	mud	1	N/A
6	1km	cliff	woodland	marsh	1	N/A
7	0.12km	cliff	woodland	mud	1	N/A
8	1.37km	alluvial/marine mud	pasture	marsh	1	N/A
9	0.5km	alluvial/marine mud	pasture	mud	1	N/A
10	0.75km	alluvial/marine mud	pasture	marsh	1	N/A
11	0.5km	alluvial/marine mud	pasture	mud	1	N/A



Map 5:

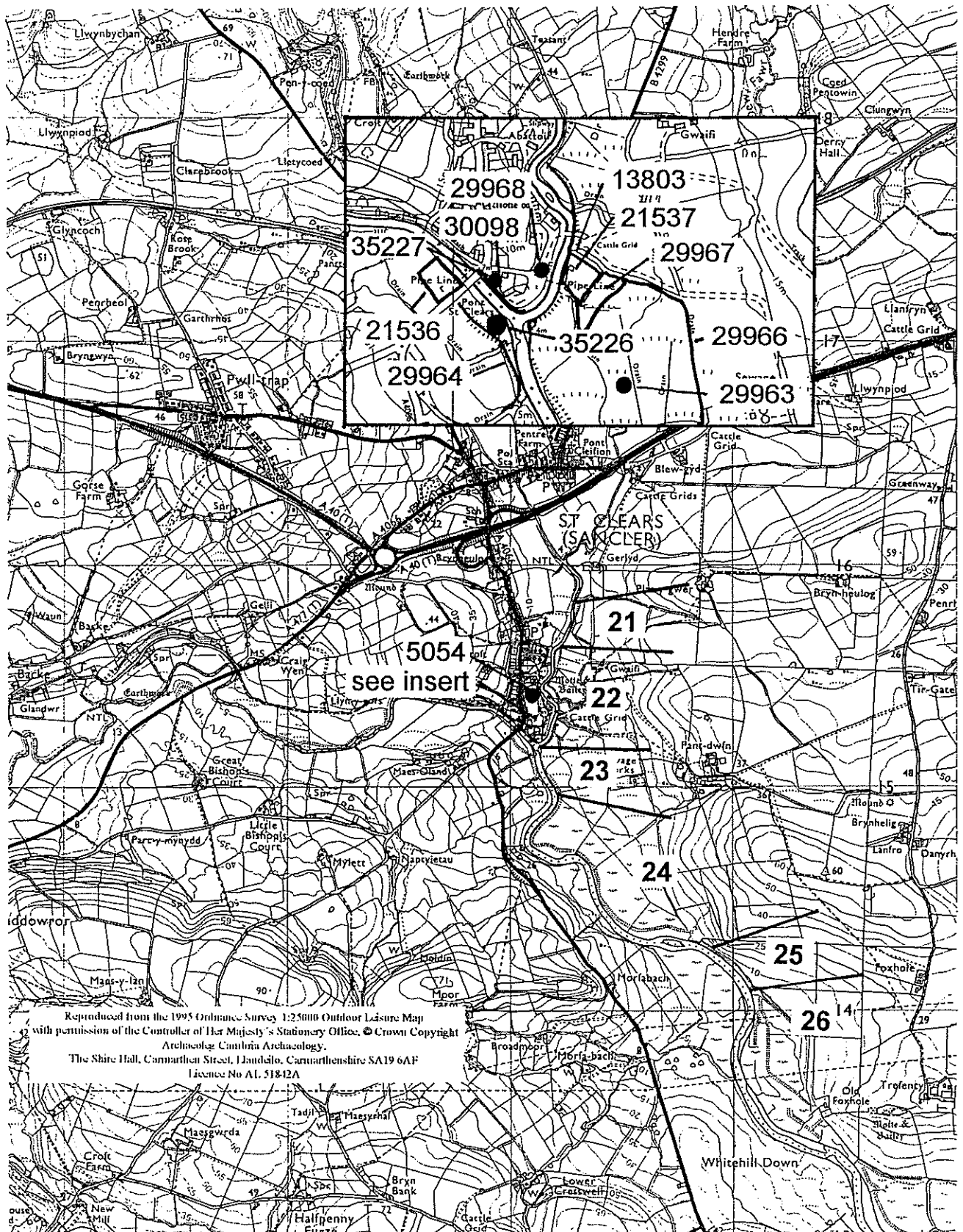
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition	Importance			Threats	Action
Erosion class										
Status										
5054	SN 28101541	St. Clears Castle	Motte and bailey	Med	C	A	1	SAM		
13803	SN 282152	Open Wharf, Common Land	Earthwork	Med /PMed	U	D	2		Trampling	
21536	SN 27951525	Brickworks. The remains of a square structure. Very overgrown.	Building	Post Med	D	C				
21537	SN 28231527	Stone & Brick Rect. Structure. Old brick works.	Building	Post Med	D	C	2		Collapse	Surv/Excav
29963	SN 288143 SN 283158	Tafflood dfences	Linear bank	Post Med	D	D	1			
29964	SN 28021521	Pont St Clears	Linear Bank	Post Med	B	D	1			
29966	SN 28231532	Taf/Cynyn Flood Defence	Linear Bank	Post Med	C	C	1		Trampling	
29967	SN 28281524	St.Clears Clay Pit	Unknown	Post Med	E	E	2			
29968	SN 28161528	bank of 4 lime kilns, no longer exists	O. Struct	Post Med	E	E	1			
30098	SN 28101520	Quay, St Clears	O. Struct	Post Med	C	C	1			
35226	SN 28081520	Metal post used for turning ships at St Clears Quay	Post	Post Med	A	D	2			
35227	SN 28061525	Lime kiln, no longer exists	Lime kiln	Post Med	E	D	1			

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
21	0.25km	man-made bank	improved pasture	mud	1	N/A
22	0.5km	man-made bank	improved pasture	mud	2	N/A
23	0.25km	man-made bank	pasture	mud	2	N/A
24	1.25km	alluvial/marine mud	rough pasture	mud	2	N/A
25	0.37km	alluvial/marine mud	pasture	mud	2	N/A
26	4.5km	man-made bank	pasture	marsh	1	N/A



Map 6:

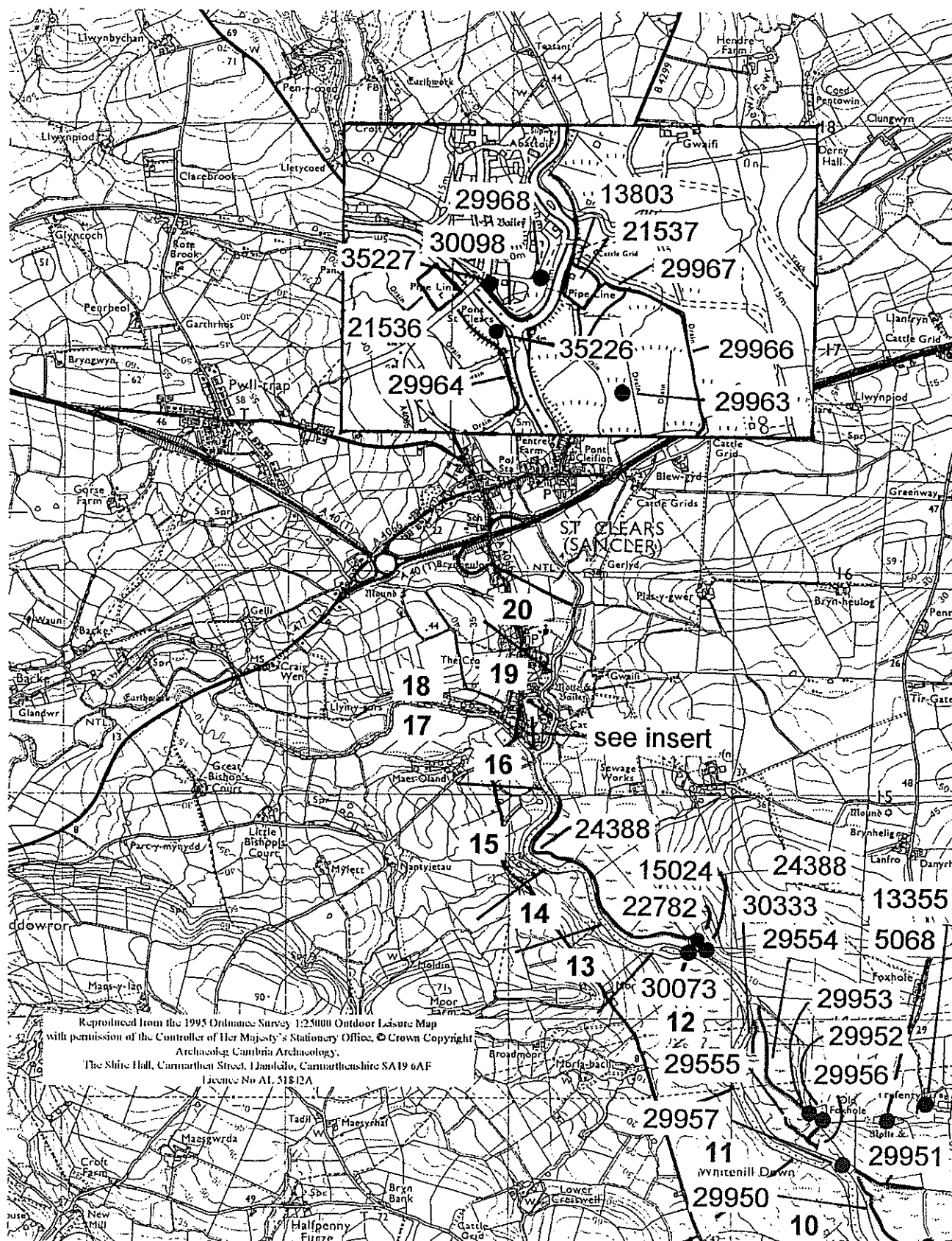
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition	Importance	Erosion class	Status	Threats	Action
15024	SN 28851435	Lime Kiln	O. Struct	Post Med	D	D	1		Vegetation	Survey
22782	SN 28891432	Parc y Craig, Cottage	Building	Post Med	D	D	1		Vegetation	
24388	SN 2015	Taf/Cywyn Flood Prevention	Linear Bank	Post Med	B	C	1			
29950	SN 29571330	Taf/Cywyn Flood Defences	Linear Bank	Post Med	C	C	3			
29951	SN 29551334	Taf/Cywyn Flood Defences	Linear Bank	Post Med	C	C	3			
29952	SN 29411356	Pump, Old Foxhole		Post Med	E	E	1			
29953	SN 29371358	Sluice/Pond, Old Foxhole			E	E	1			
29954	SN 29131406	Taf/Cywyn Flood Defences	Linear Bank	Post Med	C	C	3			
29955	SN 29111400	Taf/Cywyn Flood Defences	Linear Bank	Post Med	C	C	3			
29956	SN 29241356	Taf/Cywyn Flood Defences	Linear Bank	Post Med	C	C	3			
29957	SN 29451342	Taf/Cywyn Flood Defences	Linear Bank	Post Med	C	C	3			
29963	SN 288143	Taf/Cywyn Flood Defence	Linear Bank	Post Med	C	C	3			
30073	SN 28771430	Possible shipwreck site in mid channel.	Shipwreck.	Post Med	U	E	5			
			Documents only.							
30333	SN 29101399	Taf/Cywyn Flood Defences	Linear Bank	Post Med	C	C	3			
5068	SN 29681355	Trefentny motte and bailey castle.	Mound	Medieval	C	A	1	SAM	Vegetation and animal burrowing.	
13355	SN 29101399 SN 29091383	Taf/Cowyn Flood defences	Linear Bank	Post Med	C	C	3			
13803	SN 282152	Open Wharf, Common Land	Earthwork	Med /PMed	U	D	2		Trampling	
21536		Brickworks. The remains of a square structure. Very overgrown.	Building	Post Med	D	C				
21537	SN 28231527	Stone & Brick Rect. Structure. Old brick works.	Building	Post Med	D	C	2		Collapse	Surv/Excav
29963	SN 288143 SN 283158	Taf flood dfences	Linear bank	Post Med	D	D	1			
29964	SN 28021521	Pont St Clears	Linear Bank	Post Med	B	D	1			
29966	SN 28231532	Taf/Cynyn Flood Defence	Linear Bank	Post Med	C	C	1		Trampling	
29967	SN 28281524	St. Clears Clay Pit	Unknown	Post Med	E	E	2			
29968	SN 28161528	Lime Kiln no longer exists	O. Struct	Post Med	E	E	1			
30098	SN 28101520	Quay, St Clears	O. Struct	Post Med	C	C	1			
35226	SN 28081520	Metal post used for turning ships at St Clears Quay	Post	Post Med	A	D	2			
35227	SN 28061525	Lime kiln	Lime kiln	Post Med	E	D	1			

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
10	0.75km	alluvial/marine mud	pasture	marsh	1	N/A
11	0.5km	alluvial/marine mud	pasture	mud	1	N/A
12	1km	alluvial/marine mud	pasture	marsh	2	N/A
13	0.25km	alluvial/marine mud	pasture	mud	2	N/A
14	0.5km	alluvial/marine mud	pasture	marsh	2	N/A
15	0.62km	alluvial/marine mud	pasture	mud	1	N/A
16	0.25km	man-made bank	pasture	marsh	1	N/A
17	0.17km	man-made wall	man-made structure	mud	1	N/A
18	0.25km	man-made bank	other, carpark	mud	1	N/A
19	0.25km	man-made bank	man-made structure	mud	1	N/A
20	0.3km	man-made bank	pasture	mud	1	N/A



Map 7:

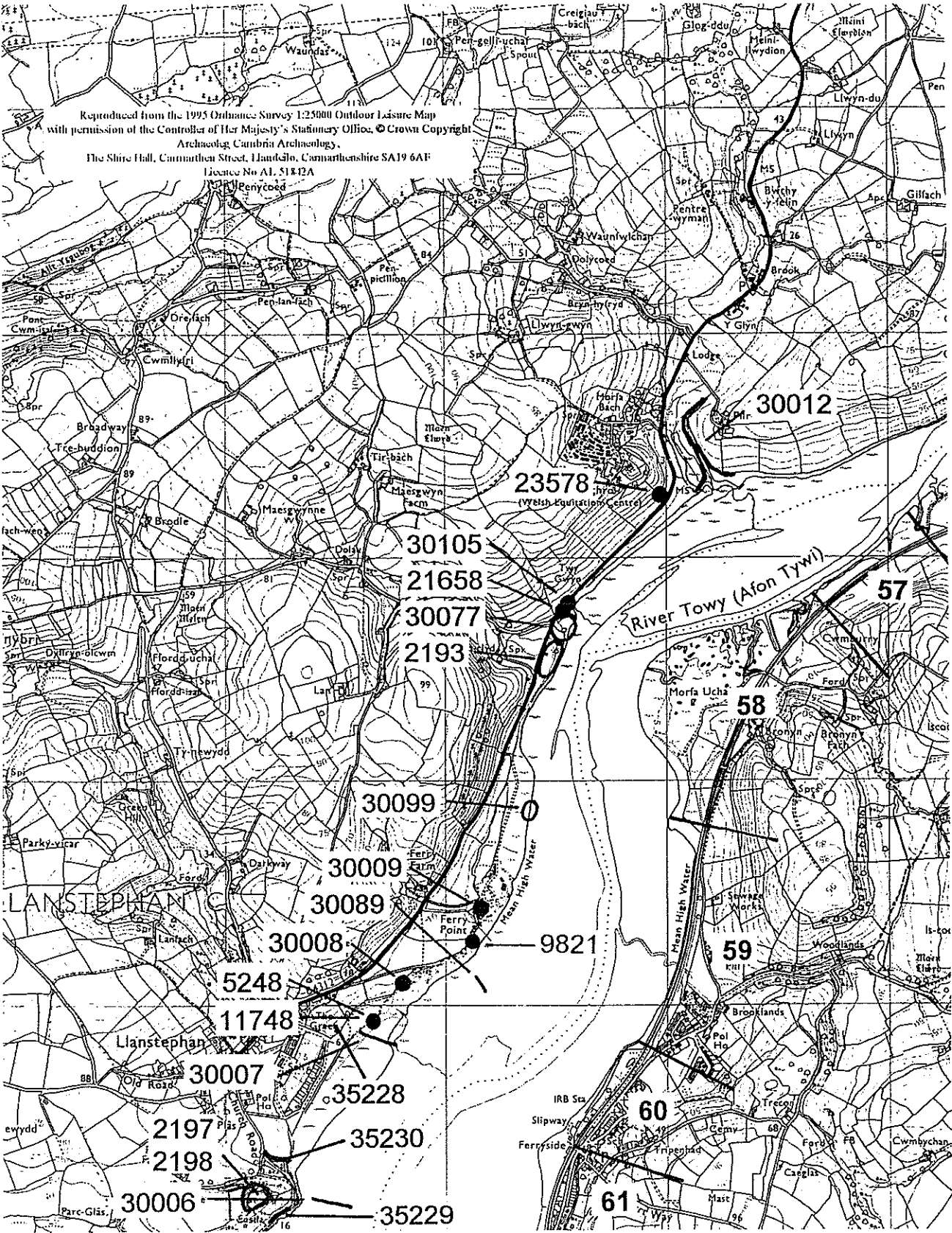
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition			Threats		Action
Importance										
Erosion class										
Status										
2193	SN 364125	A low mound recorded by RCAHMD in 1912.	Unknwon	Unknown	U	U	U			
2197	SN 35151017	Llanstephan Castle	Castle	Medieval	R	A	1	GAM		
2198	SN 35151017	Llanstephan Castle Hillfort	Hillfort	Iron Age	B	A	1	GAM		
5248	SN 35701092	Carreg Fawr Nant Jack	Standing stone	Bronze Age	E	E	3			
9821	SN 361112	Bronze socketed hammer recovered from Llanstephan beach.	Finds		U	U	3			
11748	SN 35701092	Carreg Fach Nant Jack	Standing stone	Bronze Age	E	E	3			
30006	SN 35401025		Landing place	Post Med	U	D	5			
	SN 35531018									
30007	SN 35581090		Landing place	Post Med	U	D	5			
30008	SN 358111	Placename, Ferry Point.	Ferry?	Post Med	U	U	3			
30089	SN 351111		O.Struct.	Post Med	D	D	5			
30099	SN 3611	Wooden shipwreck	Shipwreck	Post Med	D	C	5			Survey
30012	SN 3713	Flood defences	Linear bank	Post Med	B	D	3			
23578	SN 39851031	Cottage.	Building	Post Med	U	U	1			
30105	SN 36551277	Wooden shipwreck	Shipwreck	Post Med	D	C	5			Survey
30077	SN 365127	A waiting and partial unloading point for ships waiting to enter Crmarthen.	Anchorage	Medieval?	U	D	5			
				Post Med?						
				Modern						
30009	SN 361114		Ferry?	Post Med	U	U	3			
21658	SN 36551277	Pil Glas limekiln.	Limekiln	Post Med	C	D	2		Vegetation is sriously affecting the structure of the kiln.	Survey
35228	SN	The Green, reclaimed land and planted housing	Topog.	Modern	A	C	1			
35229	SN	The Sticks, viewing platform	O.Struct.	Modern	B	D	1			
35230	SN	The Sticks, old coal road down to the shore, also a tourist walk	Topog.	Post Med	A	D	1			
				Modern						

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
57	0.75km	man-made wall	man-made structure	mud	2	N/A
58	2.25km	man-made wall	man-made structure	marsh	2	N/A
59	1km	man-made wall	man-made structure	mud	1	N/A
60	0.6km	man-made bank	man-made structure	sand	1	N/A
61	2.5km	man-made wall	man-made structure	mixed	1	5836



Map 8:

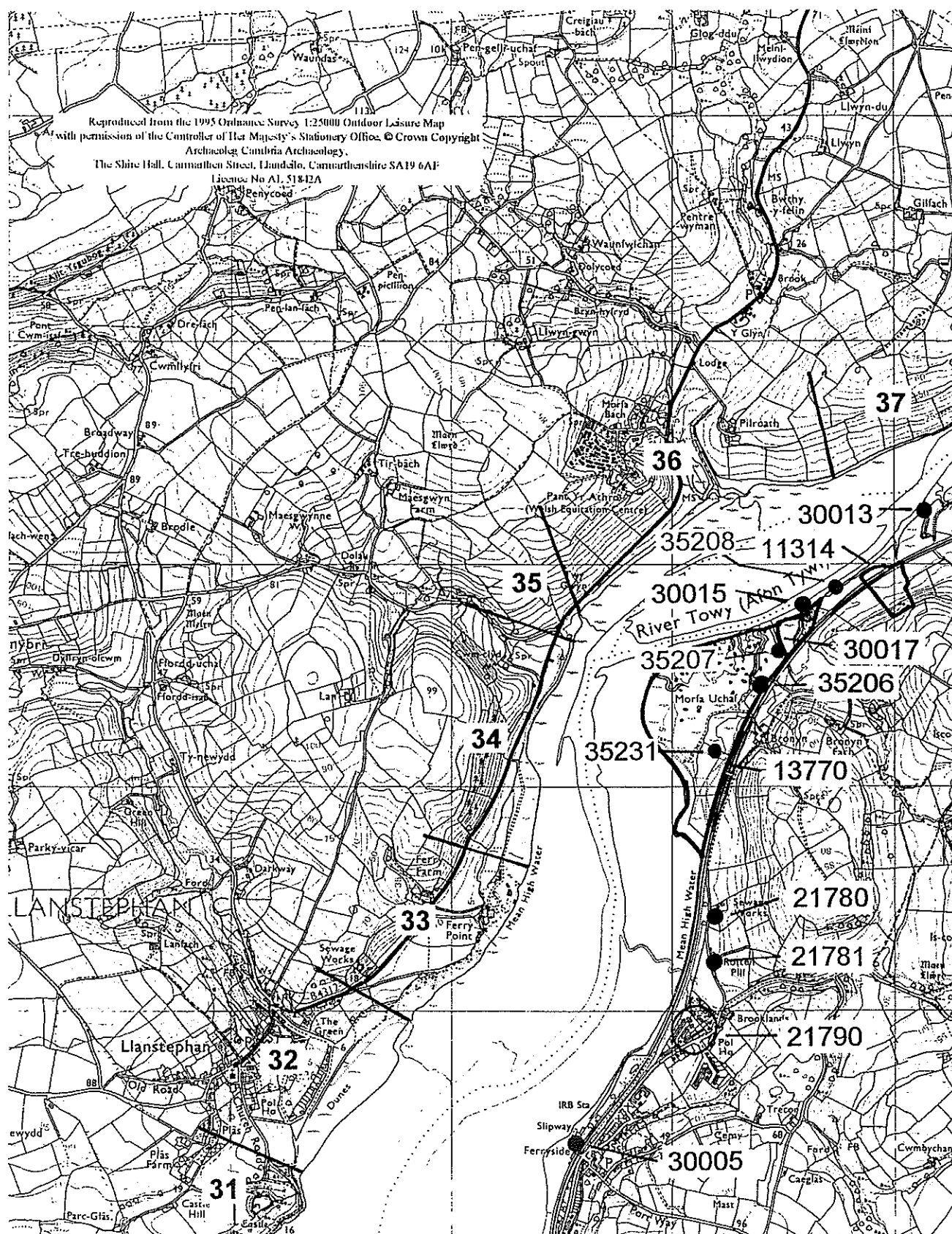
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition	Threats	Action
Importance							
Erosion class							
Status							
11314	SN 380129	Placename, Park Tyr Glebe.	Glebe land	Medieval?	U	E	1
13770	SN 372125		Common land	Post Med	U	E	1
21780	SN 37181145		Cottage	Medieval?	E	U	1
21781	SN 37201120		Farmstead	Post Med	B	D	1
21790	SN 370109		Brickworks	Post Med	E	D	1
30005	SN 36561040	Modern breeze-block construction.	Lifeboat House	Post Med	A	D	1
30013	SN 38131325		Navigation marker	Modern	E	E	2
30015	SN 35781285		Navigation marker	Post Med	E	E	2
30017	SN 37521249		Linear bank	Post Med	C	D	2-3
	SN 37471275						
35206	SN 37331245	Wooden Revet. Hazel Wattling	O.Struct	Post Med	C	D	3
35207	SN 37501260	Wooden shipwreck	Shipwreck	Post Med	D	D	5
35208	SN37451285	A series of uprights on the dge of the main river channel.	Fishtraps	Post Med?	D	D	5
35231	SN 37201215	4" Coastal Gun Battery	Blockhouse	Modern	B	C	1

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
31	4.37km	cliff	pasture	sand	1	5038
32	1km	man-made wall	other, carpark	sand	1	N/A
33	1km	man-made wall	man-made structure	sand	1	N/A
34	1.25km	alluvial/marine mud	pasture	mud	1	N/A
35	0.2km	alluvial/marine mud	pasture	marsh	2	N/A
36	2.25km	alluvial/marine mud	pasture	marsh	2	N/A
37	1km	alluvial/marine mud	pasture	mud	3	N/A



Map 9

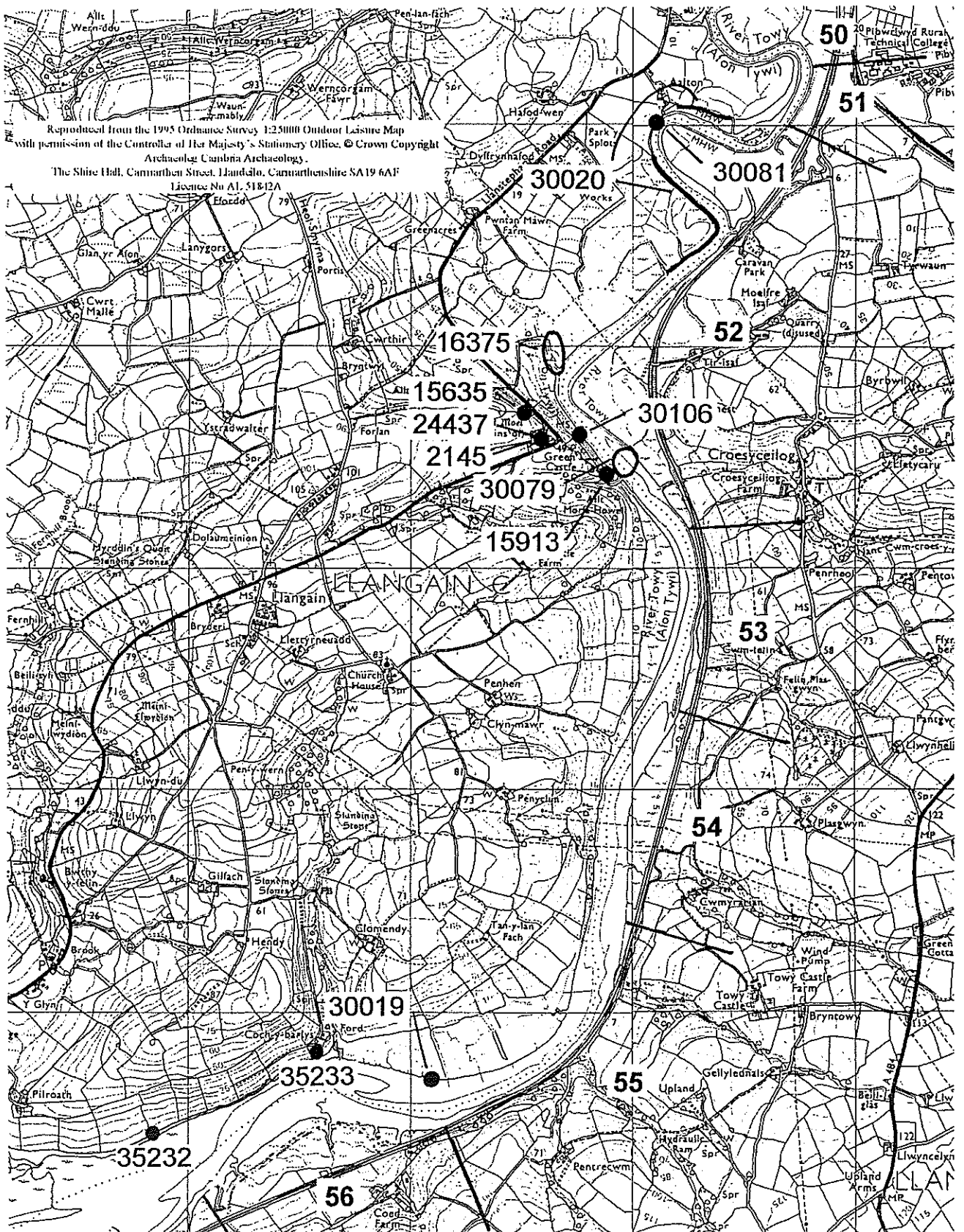
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition	Importance	Erosion class	Status	Threats	Action
2145	SN 39641658	Green Castle/Castell Moel	Building	Med/P Med	D	B	1		Vegetation	Survey
15635	SN 39531672	Quarry	Earthwork	Post Med	A	D	1			
15913	SN 391164	Quarry	Earthwork	Post Med	A	D	1			
16375	SN 396169	Blackpool Harbour	Harbour	Post Med	U	D	5			
24437	SN 39601657	Green Castle Farmhouse	Building	Med/PMed	A	B	1			Survey
30019	SN 39101370	Navigation Marker	O. Struct.	Modern	U	D	4			
30020	SN 4017		Flood defences	Post Med	C	D	2			
	SN 4018									
30079	SN 39851650	Anchorage, Black Pool	O. Struct	Med/P Med	U	C	5			
30081	SN 401180	Anchorage for ships waiting for tides to enter Carmarthen	Anchorage	Post Med	U	C	5			
			Area of maritime activity							
30106	SN 397166	Landing Place	O. Struct.	Post Med	U	D	5			
35243	SN 39921640	Wooden shipwreck	Shipwreck	Post Med	D	E	5			Survey
35232	SN 37871347	Lime Kiln	Lime Kiln	Post Med	U	D	1			
35233	SN 38601382	Park yr odin	placename	Post Med	U	D	1			

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
50	2km	man-made bank	pasture	mud	1	N/A
51	0.5km	man-made bank	rough pasture	mud	1	N/A
52	3.5km	man-made wall	man-made structure	marsh	2	N/A
53	1km	man-made wall	man-made structure	mud and marsh	2	N/A
54	1km	man-made wall	man-made structure	marsh	2	N/A
55	1.3km	man-made wall	man-made structure	mud	2	N/A
56	1.25km	man-made wall	man-made structure	marsh	2	N/A



Map 10:

Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition	Threats	Action
					Importance	Erosion class	Status
23044	SN 397138		Cottage	Post Med	U	U	1
23080	SN 406172	Pibwren	Dwelling	Post Med	E	D	1
23083	SN 402 167	Tir Nest Homestead	Homestead	Post Med	A	D	1
23089	SN 4016	Placename, Llan Ucha; llan fawr; Llan Fach	Church Land	Post Med	U	U	1
23155	SN 399139	Placename, waun Yr Odyn	Kiln?	Post Med	U	U	1
23160	SN 4015	Placename, Parc Yr Odyn Uchaf	Kiln?	Post Med	U	U	1
30013	SN 38131325		Navigation marker	Post Med	E	E	2
30014	SN 38461349	Wooden post with orange plastic globe on top.	Navigation marker	Post Med	A	D	2
30016	SN 385175		Navigation maker	Post Med	U	E	2
30018	SN 382171	Low spread bank. Breached in several places. Good grass cover.	Sea defence	Post Med	C	D	1
31575	SN 389173	Swausea - Carmarthen railway	railway	Modern	A	D	1
	SN 3817						
	SN 4022						

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
36	2.25km	alluvial/marine mud	pasture	marsh	2	N/A
37	1km	alluvial/marine mud	pasture	mud	3	N/A
38	1.62km	alluvial/marine mud	pasture	marsh	2	N/A
39	2.5km	alluvial/marine mud	pasture	mud	3	N/A
40	0.62km	rock with drift cover	woodland	mud	3	N/A
41	1.25km	man-made bank	pasture	marsh	2	N/A
42	1km	man-made bank	pasture	mud	2	N/A
43	0.37km	man-made bank	rough pasture	mud	2	N/A
44	0.5km	man-made bank	pasture	marsh	2	N/A
45	1.25km	man-made bank	arable	mud	2	N/A



Map 11

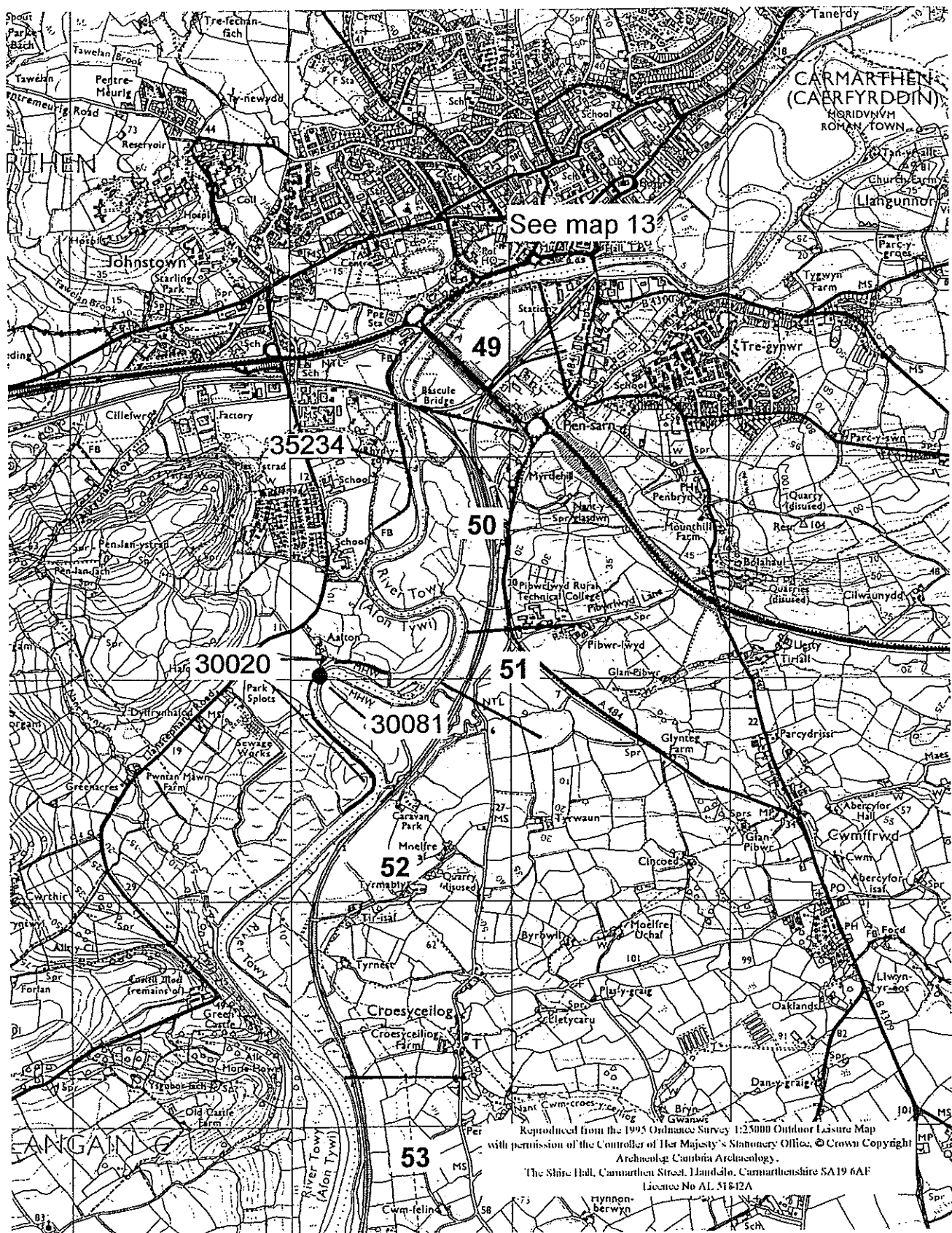
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition	Importance	Erosion class	Threats	Action
							Status		
30020	SN 4017		Flood defences	Post Med	C	D	2		
	SN 4018								
30081	SN 401180	Anchorage for ships waiting for tides to enter Carnarthen	Anchorage Area of maritime activity	Post Med	U	C	5		
35234	SN 40351867 SN 40501945	Flood bank and footpath	Flood defences	Post Med Modern	R	C	1		

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
49	1km	man-made bank	improved pasture	mud	1	N/A
50	2km	man-made bank	pasture	mud	1	N/A
51	0.5km	man-made bank	rough pasture	mud	1	N/A
52	3.5km	man-made wall	man-made structure	marsh	2	N/A
53	1km	man-made wall	man-made structure	mud and marsh	2	N/A



Map 12: SN41NW

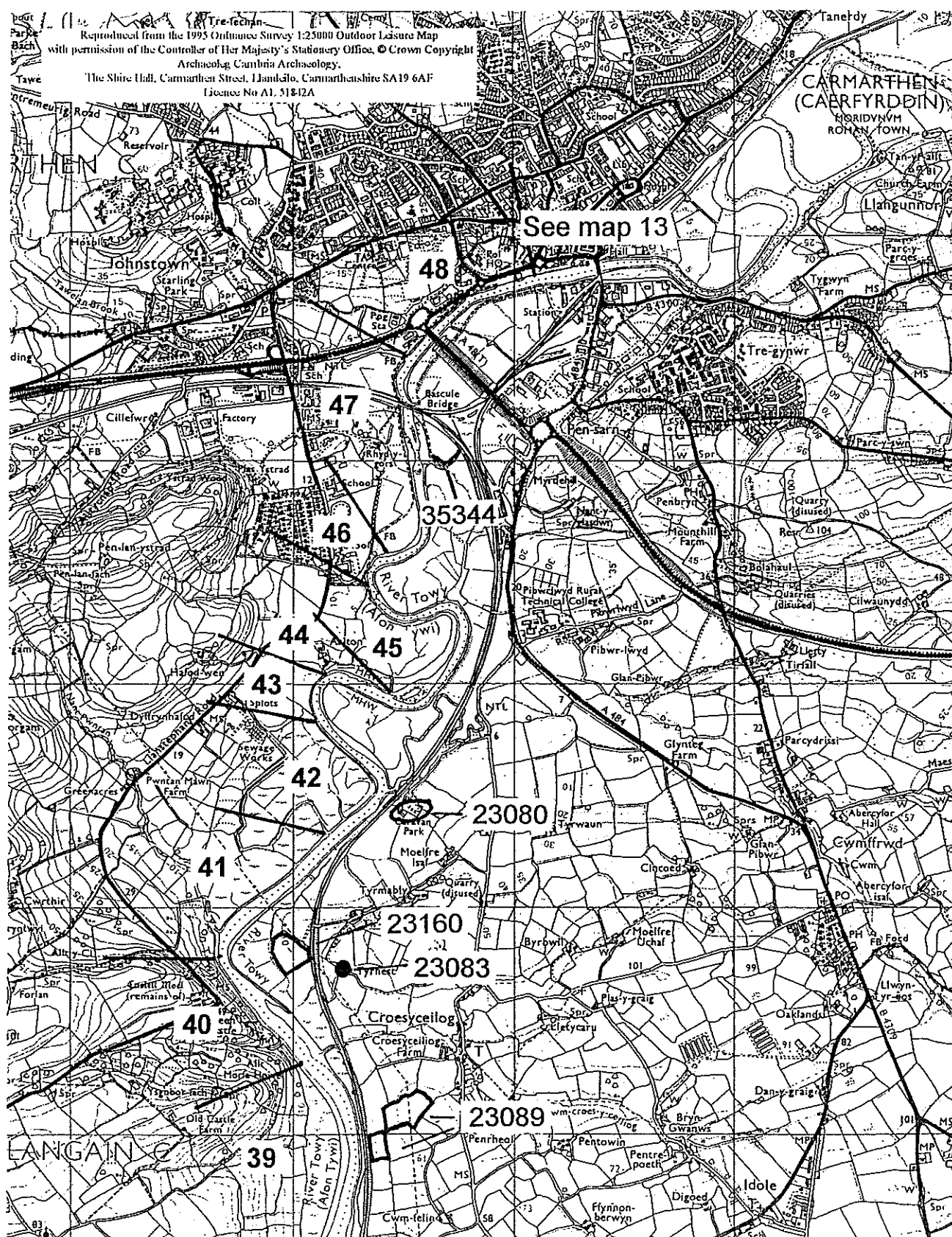
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition			Threats	Action
Importance									
Erosion class									
Status									
23080	SN 406172	Pibwren	Dwelling	Post Med	E	D	1		
23083	SN 402 167	Tir Nest Homestead	Homestead	Post Med	A	D	1		
23089	SN 4016	Placename, Llan Ucha; llan fawr; Llan Fach	Church Land	Post Med	U	U	1		
23160	SN 4015	Placename, Parc Yr Odyn Uchaf	Kiln?	Post Med	U	U	1		
35344	SN 40621902 SN 40751905	Short length of flood bank	Flood defence	Post med	B	D	2		

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
39	2.5km	alluvial/marine mud	pasture	mud	3	N/A
40	0.62km	rock with drift cover	woodland	mud	3	N/A
41	1.25km	man-made bank	pasture	marsh	2	N/A
42	1km	man-made bank	pasture	mud	2	N/A
43	0.37km	man-made bank	rough pasture	mud	2	N/A
44	0.5km	man-made bank	pasture	marsh	2	N/A
45	1.25km	man-made bank	arable	mud	2	N/A
46	0.25km	man-made bank	pasture	mud	2	N/A
47	1.25km	man-made bank	rough pasture	mud	1	N/A
48	1km	man-made wall	man-made structures	mud	1	N/A

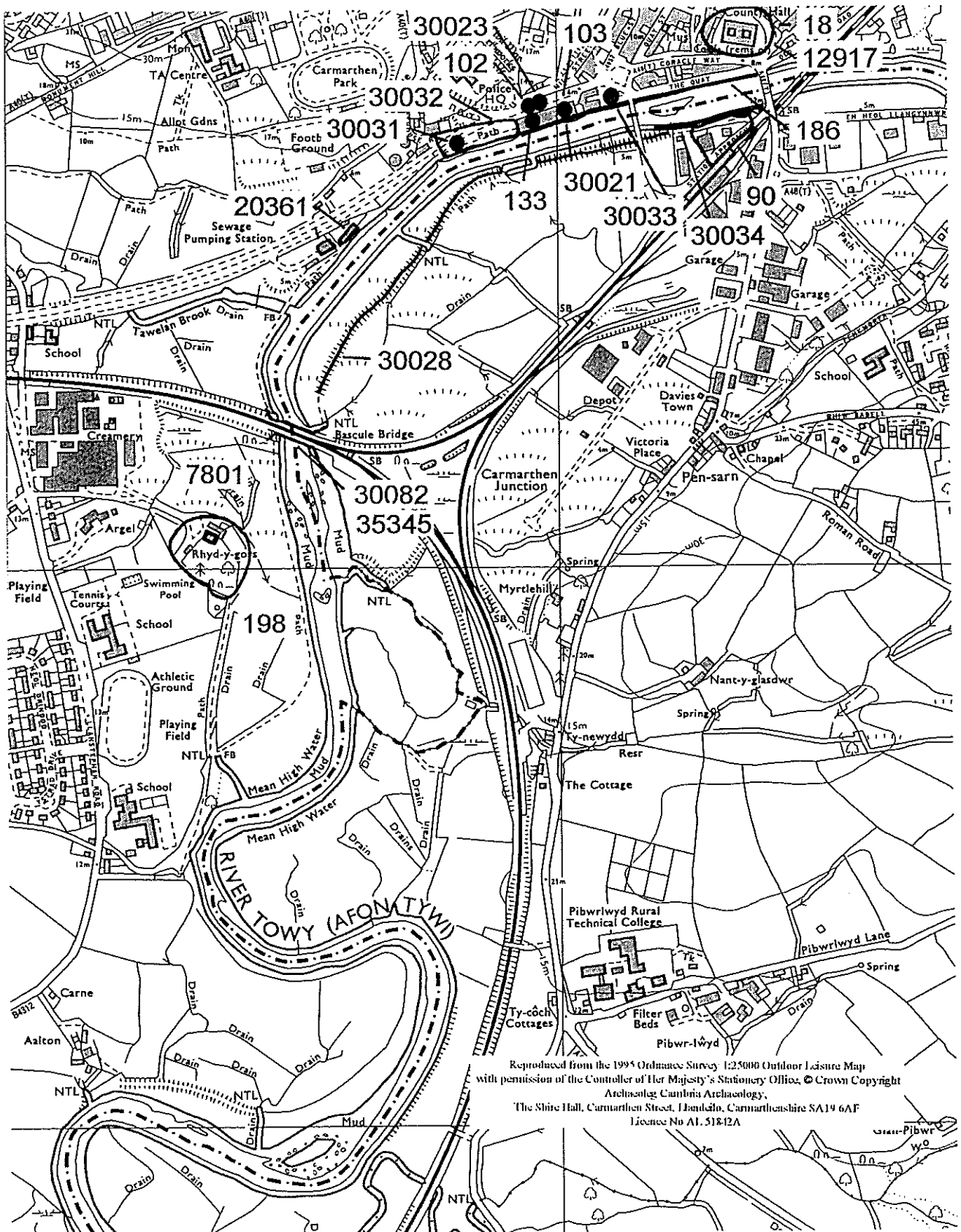


Map 13:

Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition	Importance	Erosion class	Status	Threats	Action
18	SN 41351995	County Gaol	Finds	Roman	U	U	1			
90	SN 41301977	Bridge Wharf Saw Mill	Saw mill	Post Med	B	D	1			
102	SN 40961983		Pottery	Post Med	E	E	1			
103	SN 41021982	St David's Saw Mill	Saw mill	Post Med	E	E	1			
133	SN 09511980	Warehouse WCA Building	Building	Post Med	E	E	1			
186	SN 41201985	Quay		Post Med	A	B	1			
198	SN 40401905	Rhyd Y Gors, Dwelling	Building	Med/P.Med	E	E	1			
7801	SN 40401905	Rhyd Y Gors, Dwelling	Building	Post Med	E	E	1			
12917	SN 413199	Carmarthen Castle	Finds	Unknown	U	U	1			
20361	SN 406196		Saw Mill	Post Med	E	E	1			
30021	SN 40931978	Tywi Wharf	Wharf	P.Med/Mod	E	E	1			
	SN 41041981									
30023	SN 40951984		Tin Mill	Post Med	E	E	1			
30028	SN 40551931	Tywi Flood Defences	Linear bank	Post Med	R	D	1			
	SN 41211976									
30031	SN 40831976		Timberyard	Post Med	E	E	1			
30032	SN 40881978	Saw Mill		Post med	U	U	1			
30033	SN 41091983	Tywi Crane	Crane	Modern	E	E	1			
30034	SN 41211978	Tywi Wharf	Wharf	Modern	A	D	1			
	SN 41361981									
30082	SN 40521925	Bascule Bridge	O.Struct	Modern	B	A	1			Listing
35345	SN 40521925	Wooden piers from Brunel's bridge, the predecessor of the Bascule Bridge.). Struct.	Post Med	C	A	3			



Map 14:

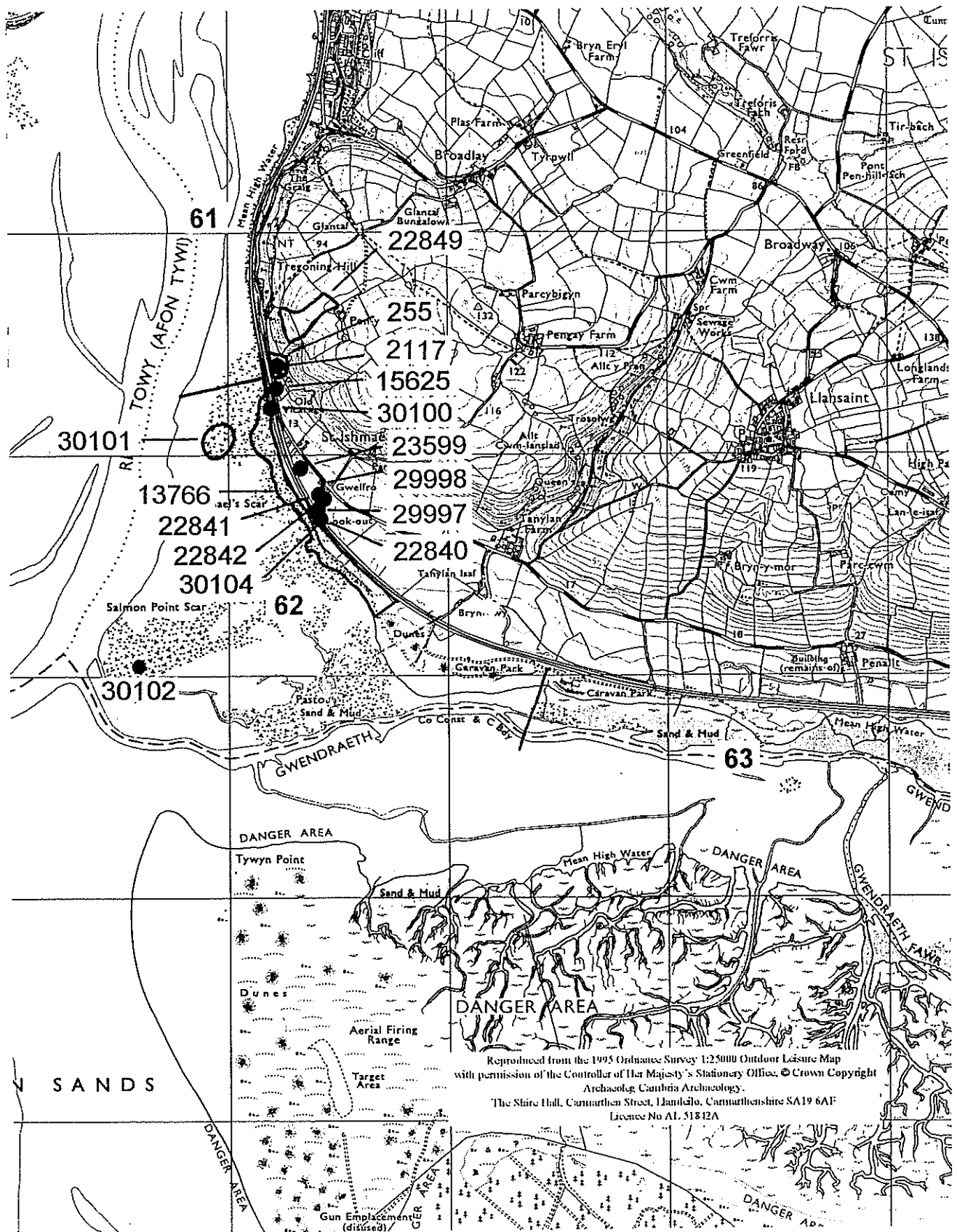
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition			Threats	Action
Importance									
Erosion class									
Status									
255	SN 363084	St.Ishmael's Churchyard	Cemetery	Post Med	A	A	1	Trampling by visitors Vandalism	
2117	SN 36220840	St.Ishmael's Church	Building	Med./P.Med	A	A	1		
2121	SN 362093	Finds	Finds	Prehistoric	U	U	5		
13766	SN 363078	The Burrows	Common land	Medieval	C	D	5		
				Post Med					
15625	SN 36160838	Vicarage	Building	Post Med	A	D	1		
22842	SN 36460783	Danylan Cottage	Building	Post Med	A	D	1		
22849	SN 363086		Cottage	Post Med	U	U	1		
23599	SN 36330797		Sand Pit	Post Med	U	U	1		
29997	SN 36400775	Lookout	Building	Modern	A	D	1		
29998	SN 36370777	Linear Trackway	Trackway	Modern	A	D	1		
30100	SN 36180820	Lookout--Concrete & Brick-built	Building	Modern	B	C	1		
30101	SN 359080	St Ishmaels Scar Fishtrap or Training wall	Fishtrap Training wall	Post Med?	D	C	5		
30102	SN 35600705	Fishtrap, currently besanded	Fishtrap	Medieval? Post Med?	C	C	5		

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
61	2.5km	man-made wall	man-made structure	mixed	1	5836
62	2.5km	drift, blown sand	pasture, caravan parks	mud	2	5060
63	3.35km	man-made wall	man-made structure	marsh/mud	2	5062



Map 15:

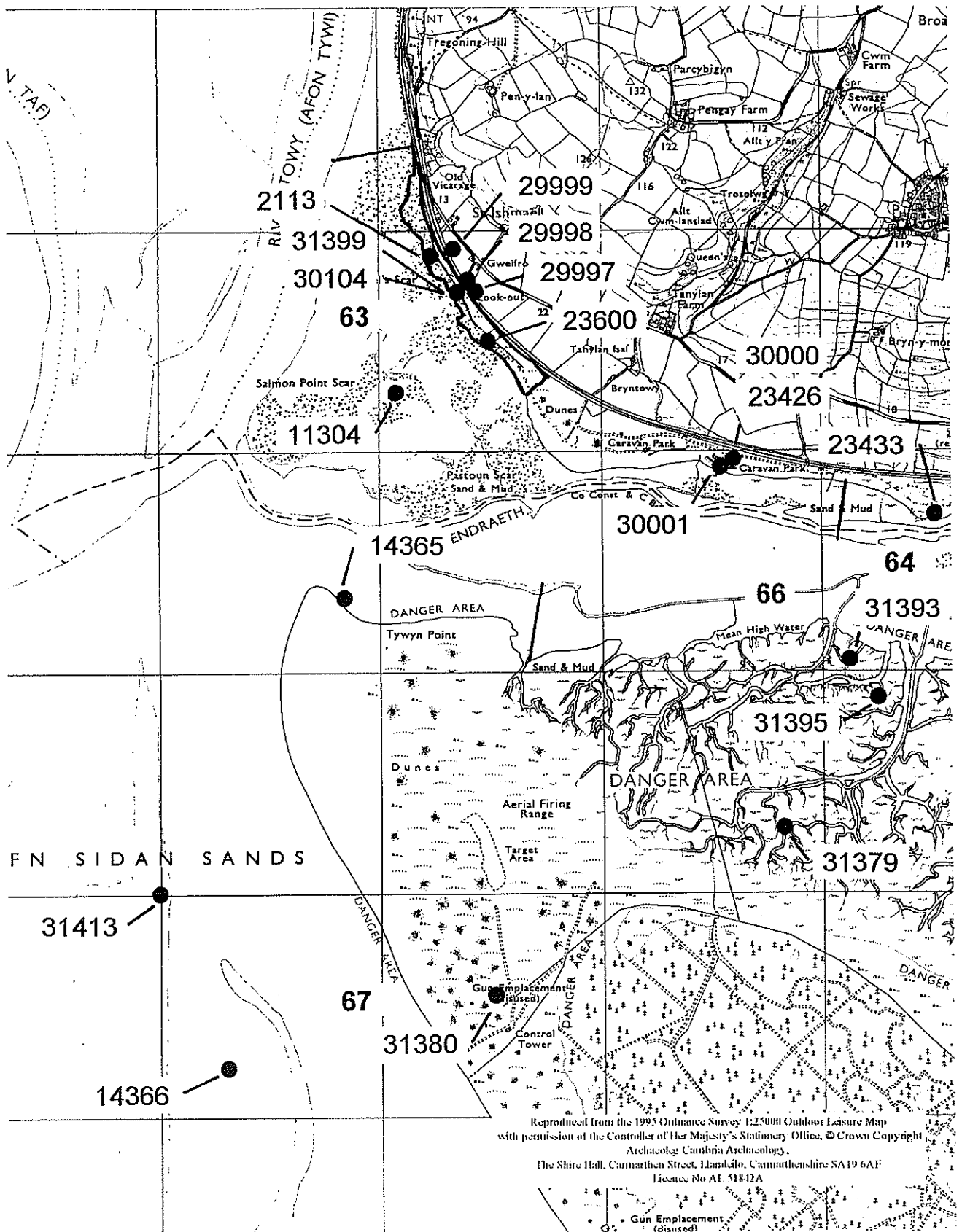
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition			Importance		Threats	Action
Erosion class											
Status											
2113	SN 36300775	St.Ishmael's DMV	DMV	Medieval	D	B	5		Metal Detectorists	Survey and monitoring	
11304	SN 36080792		Finds	Roman	U	U	5				
14365	SN 36200650	Shipwreck, <i>The Paul</i>	Shipwreck	Post Med	D	D	5				
14366	SN 35300420	Shipwreck, <i>The Teviotdale</i>	Shipwreck	Post Med	D	D	5				
23426	SN 376049	Bertwyn	Farmstead	Post Med	U	U	1				
23433	SN 385067		Quay	Post Med	E	E	5				
23600	SN 36520750		Gun	Modern	E	E	2				
			Emplacement								
29997	SN 36400775	Lookout	Building	Modern	A	D	1				
29998	SN 36370777	Linear Trackway	Trackway	Modern	A	D	1		Trampling by visitors		
29999	SN 36350790		Sand Pit	Modern	E	E	1				
30000	SN 376049	Bertwyn	Farmstead	Post Med	U	U	1				
30001	SN 374069		Sea defences	Post Med	E	E	1				
				Modern							
30104	SN 36350775		Sea defences	Modern	D	D	5				
31379	SN 37780528	Wreckage of a Wellington Bomber that crashed on a training flight from nearby Pembrey Airfield.	Aircraft	Modern	D	U	4				
31380	SN 36500454	Cocrete base	Gun Emplacement	Modern	C	C	1				
31393	SN 38130606	Shipwreck shown on AP. Site now covered by saltmarsh.	Shipwreck	Post Med	U	U	3				
31395	SN 38240587	A series of wooden uprights visible on AP. Site now covered by saltmarsh.	Unknown	Post Med?	U	U	3				
31399	SN 36340774		Shell midden	Post Med	D	D	4		Trampling by visitors		
31413	SN 35000500	Metal posts, remains of barbed wire lines.	Beach defences	Modern	C	U	5				

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
63	3.35km	man-made wall	man-made structure	marsh/mud	2	5062
64	2.25km	man-made wall	man-made structure	marsh/mud	2	5001
66	4.75km	man-made wall	other, airfield	marsh	1	5015
67	19.12km	drift, blown sand	woodland	sand	3	5018



Map 16:

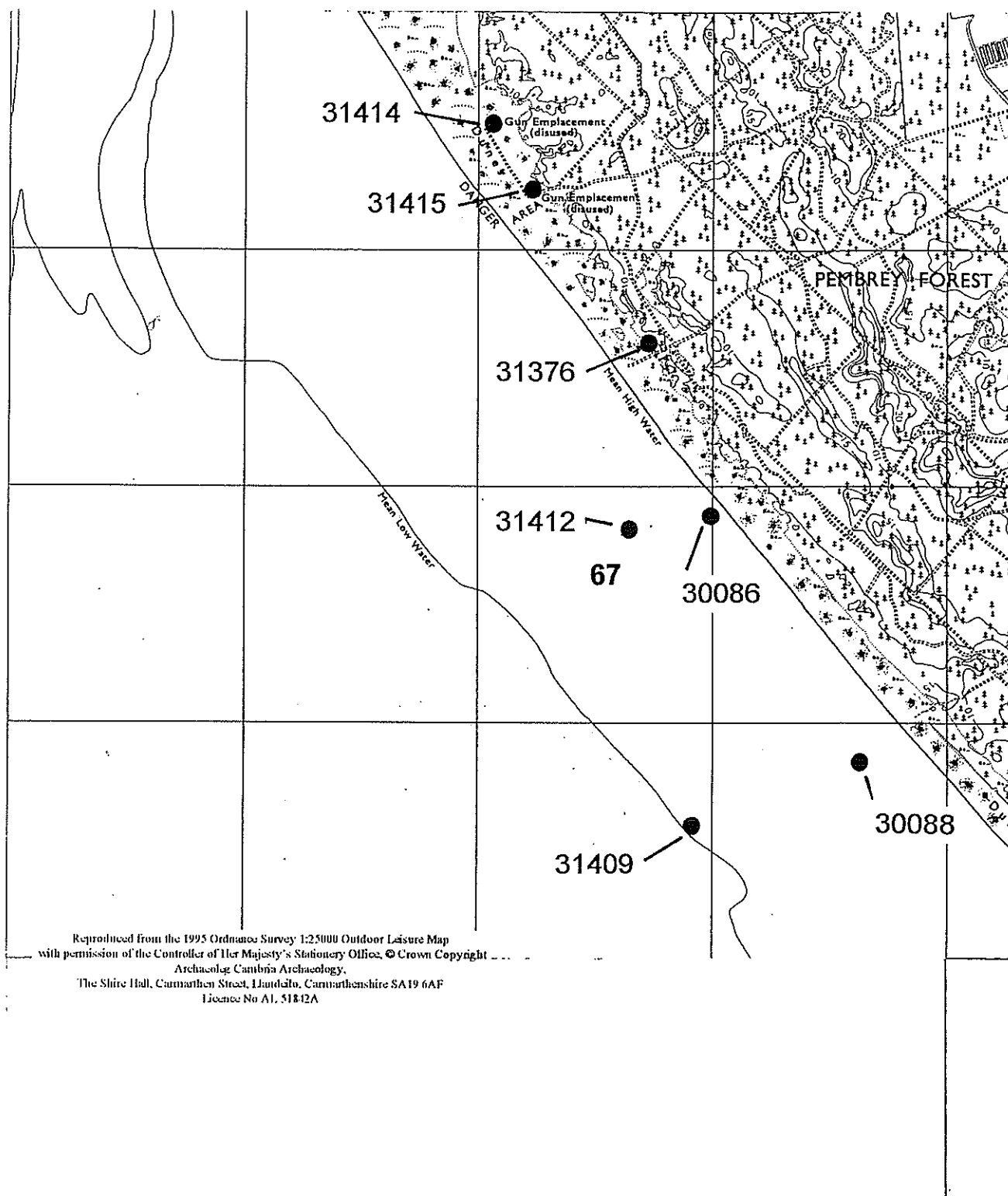
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition			Threats	Action
Importance									
Erosion class									
Status									
30086	SN 38000290	Wooden shipwreck	Shipwreck	Post Med	D	D	5		
30088	SN 38650088	Wooden shipwreck,	Shipwreck	Post Med	D	D	5		
31312	SN 37600185	Wooden shipwreck, The <i>Old Dan</i>	Shipwreck	Post Med	D	D	5		
31376	SN 37740262	WWII gun emplacement.	Gun emplacement	Modern	D	D	2		
31409	SN 37900060	Structure made up of wooden and metal posts. Part of the WWII defences.	Beach defences	Modern	D	D	5		
31414	SN 37070345	WWII gun emplacement.	Gun emplacement	Modern	D	D	2		
31415	SN 37240326	WWII gun emplacement.	Gun emplacement	Modern	D	D	2		

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
67	19.12km	drift, blown sand	woodland	sand	3	5018



Map 17:

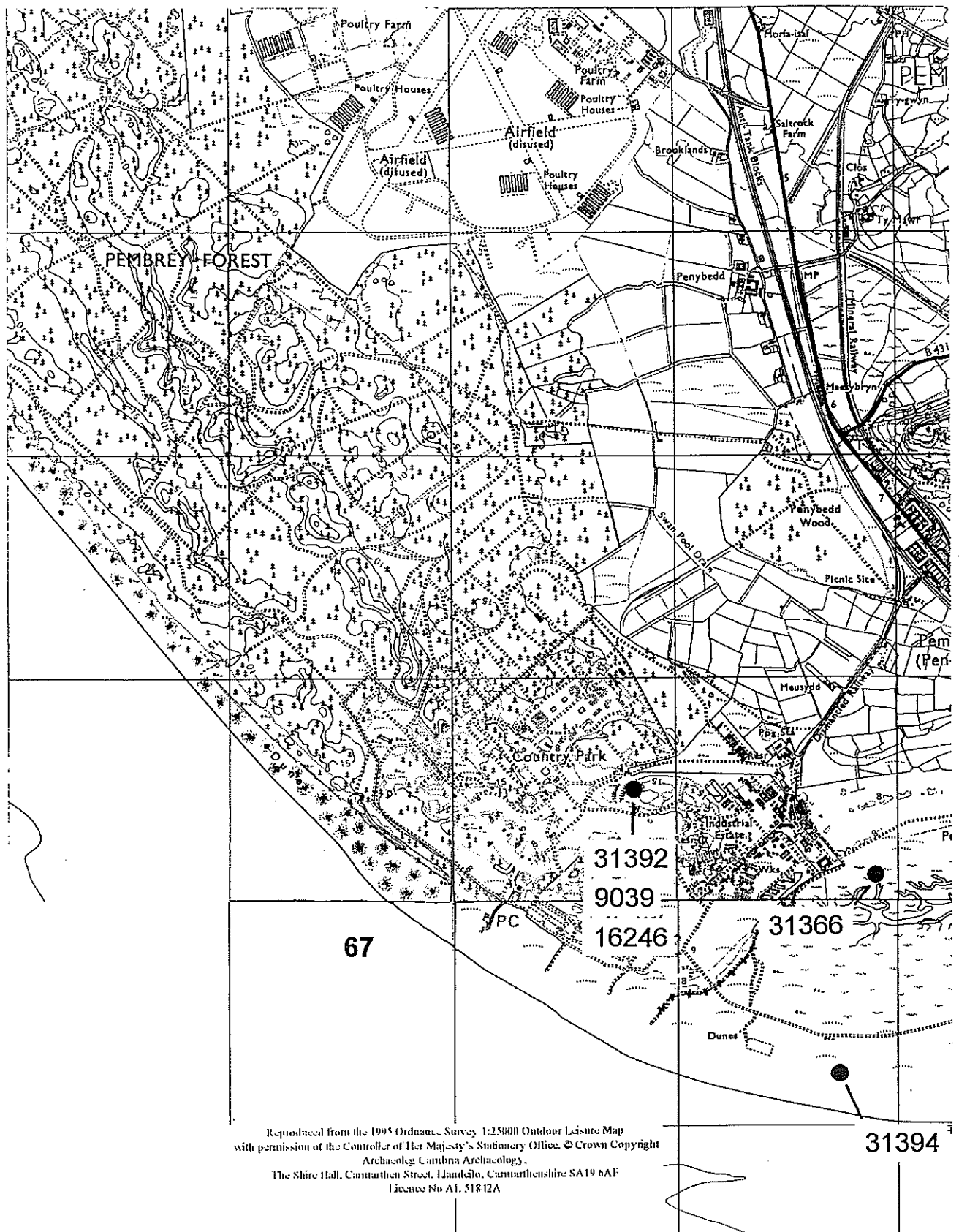
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition			Threats	Action
Importance									
Erosion class									
Status									
9039	SN 40800050	Nobel Explosives Company	Factory	Post Med	E	E	1		
16246	SN 40300010	Royal Ordnance Factory. Replaced the Nobel Explosives works.	Factory	Post Med	E	E	1		
31366	SN 41890013	Type 24.	Pillbox	Modern	B	D	1		
31392	SN 40800050	Pembrey Country Park, built on the site of the old Nobel Explosives works and the later Royal Ordnance Factory. The park still contains some structures and railway lines from earlier factories.	Park	Modern	-	-	1		
31394	SN 41749024	A possible shipwreck site visible on AP. Site now covered by saltmarsh and blown sand.	Shipwreck	Post Med	U	U	4		

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
67	19.12km	drift, blown sand	woodland	sand	3	5020



Map 18:

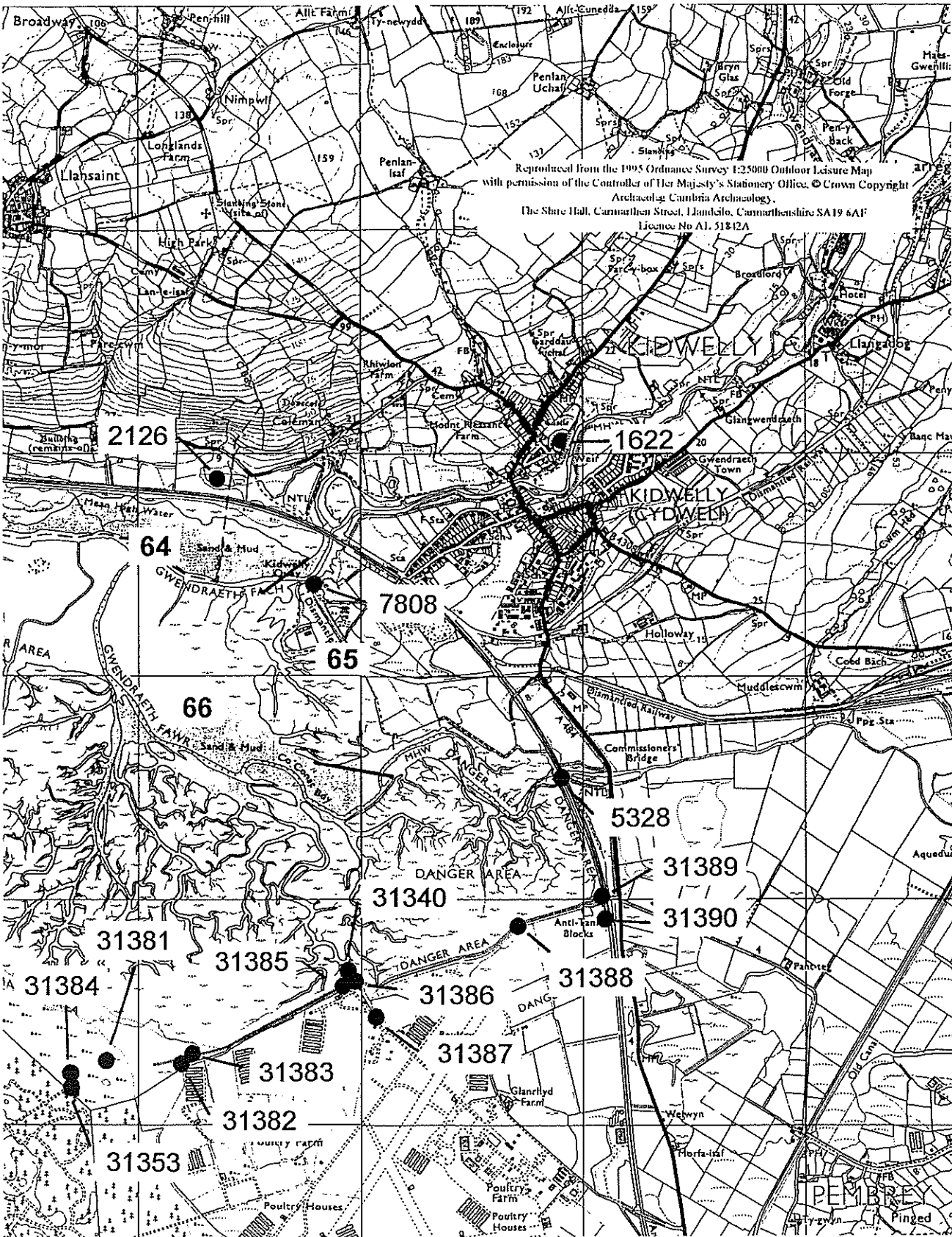
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition			Importance		Threats	Action
								Erosion class	Status		
1622	SN 40900705	Kidwelly castle	Castle	Medieval	R	A	1		GAM		
2126	SN 394069		Boundary Cross	Medieval	E	E	1				
			Boundary mound								
5328	SN 40900555	Gwendraeth Fawr Railway Bridge	Bridge	Post Med	A	C	1				
7808	SN 39760640	Kidwelly Quay.	Quay	Post Med	R	C	1				
31340	SN 39950468	Sea defence.	Linear bank	Post Med	B	D	2				
31353	SN 38700420	Enclosure and building shown on 1944 AP.	Building	Modern	E	E	2				
31381	SN 38860428	Type 23.	Earthwork								
31382	SN 39180424		Pillbox	Modern	E	E	2				
			Pond	Modern	D	E	3			Cattle trampling	
31383	SN 39240430	Small square hollow. Possibly the former site of a military building.	Earthwork	Modern	E	E	1			Cattle trampling	
31384	SN 38700424	Earthwork enclosure.	Earthwork	Post Med	C	D	1				
31385	SN 39900466	A concrete chute and hopper construction. Presumably for loading vessels that used to sail up Pill Towyn.	O.Struct.	Post Med?	B	D	2				
31386	SN 39960464	Type 23. Brick-faced.	Pillbox	Modern	B	D	1				
31387	SN 40060444	A row of four wooden uprights and one cross piece.	O.Struct.	Post Med?	D	D	5			Cattle trampling	
31388	SN 40700490	Type 23. Brick-faced	Pillbox	Modern	B	D	1				
31389	SN 41060500	Type 24.	Pillbox	Modern	B	D	1				
31390	SN 41100494	A short line of concrete blocks.	Anti-tank cubes	Modern	A	D	1				

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
64	2.25km	man-made wall	man-made structure	marsh/mud	2	5001; 5062
65	2.75km	man-made bank	man-made structure	marsh	1	5005
66	4.75km	man-made wall	other, airfield	marsh	1	5010; 5015



Map 19:

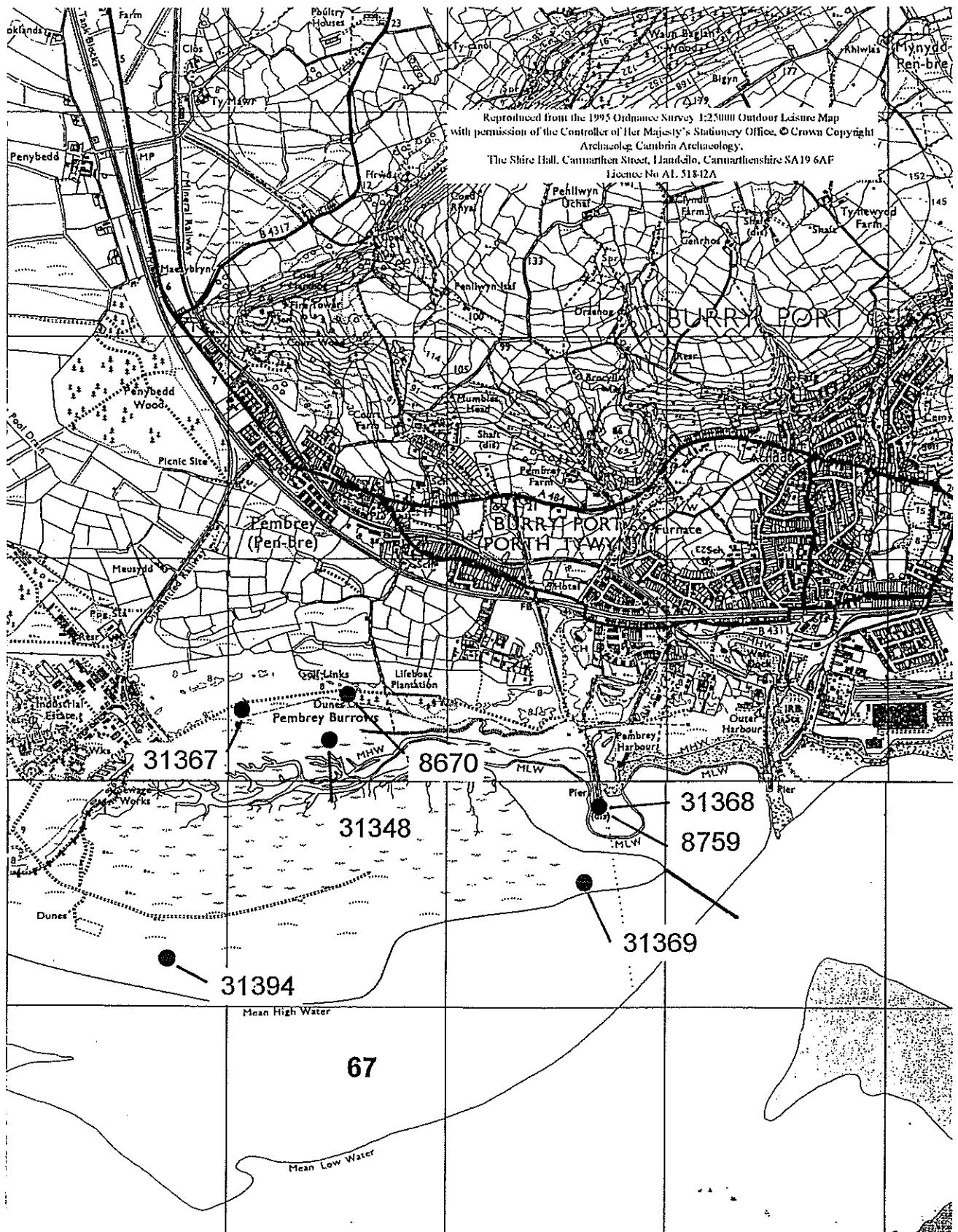
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition			Importance	Erosion class	Threats	Action
											Status
8670	SN 425001	Pembrey Dynamite Works	Tramway	Post Med	E	E	1				
8759	SN 43700990	Tramway	Lighthouse	Post Med	E	E	1				
31348	SN 42450020	A complex of slit trenches in the dunes overlooking the Loughor Estuary. Possibly a WWII command post.	Earthwork	Modern	D	D	1			Trampling by walkers and erosion by cycles and motorcycles	Trampling by walkers and golfers
31367	SN 42020034	Possible shell midden on the edge of a footpath through the golf course.	Shell Midden	Post Med	D	D	1				
31368	SS 43659990	Type 24.	Pillbox	Modern	E	E	4				
31369	SS 4365 9955	Three parallel rows of wooden uprights. Partially besandes.	Breakwater?	Post Med	C	D	4				
31394	SN 41749024	A possible shipwreck site visible on AP. Site now covered by saltmarsh and blown sand.	Shipwreck	Post Med	U	U	4				

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
67	19.12km	drift, blown sand	woodland	sand	3	5020; 5022; 5024; 5845; 5026; 5028; 5030; 5032;



Map 20:

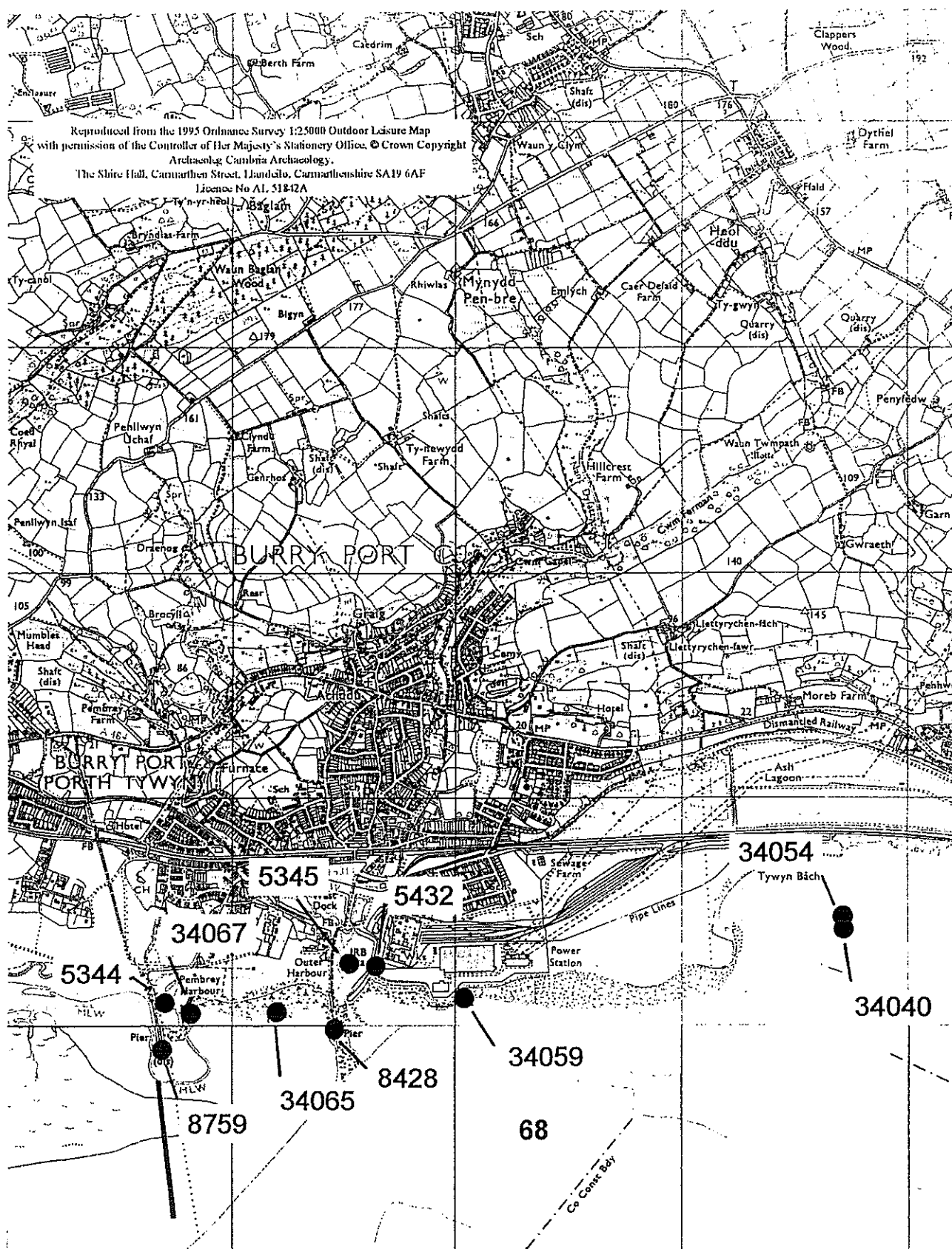
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition	Threats	Action
Importance							
Erosion class							
Status							
5344	SN 43720010	Pembrey Old harbour	Harbour	Post Med	B	B	2
8759	SN 43709900		Lighthouse	Post Med	E	E	1
5345	SN 44520030	Burry Port harbour. Replaced Pembrey Harbour when the latter silted up during the mid 19th century.	Harbour	Post Med	B	B	2
5342	SN 44650028		Lifeboat House	Post Med Modern	A	D	1
8428	SN 44450003		Lighthouse	Post Med	A	B	1
34067	SN 43830007		Groyne?	Unknown	C	D	3
34065	SN 44200007	Line of stones leading into a channel of the Loughor.	Fish wier?	Post Med	D	D	5
34059	SN 45040014		Groyne?	Unknown	U	U	4
34054	SN 47300075		Navigation marker	Unknown	U	U	4
34040	SN 46730045		Fishtrap?	Unknown	U	U	4

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
68	13.5km	man-made wall/bank	man-made structures	mud	5	5022; 5024; 5845; 5026; 5028; 5030; 5032; 5034; 5036;



Map 21:

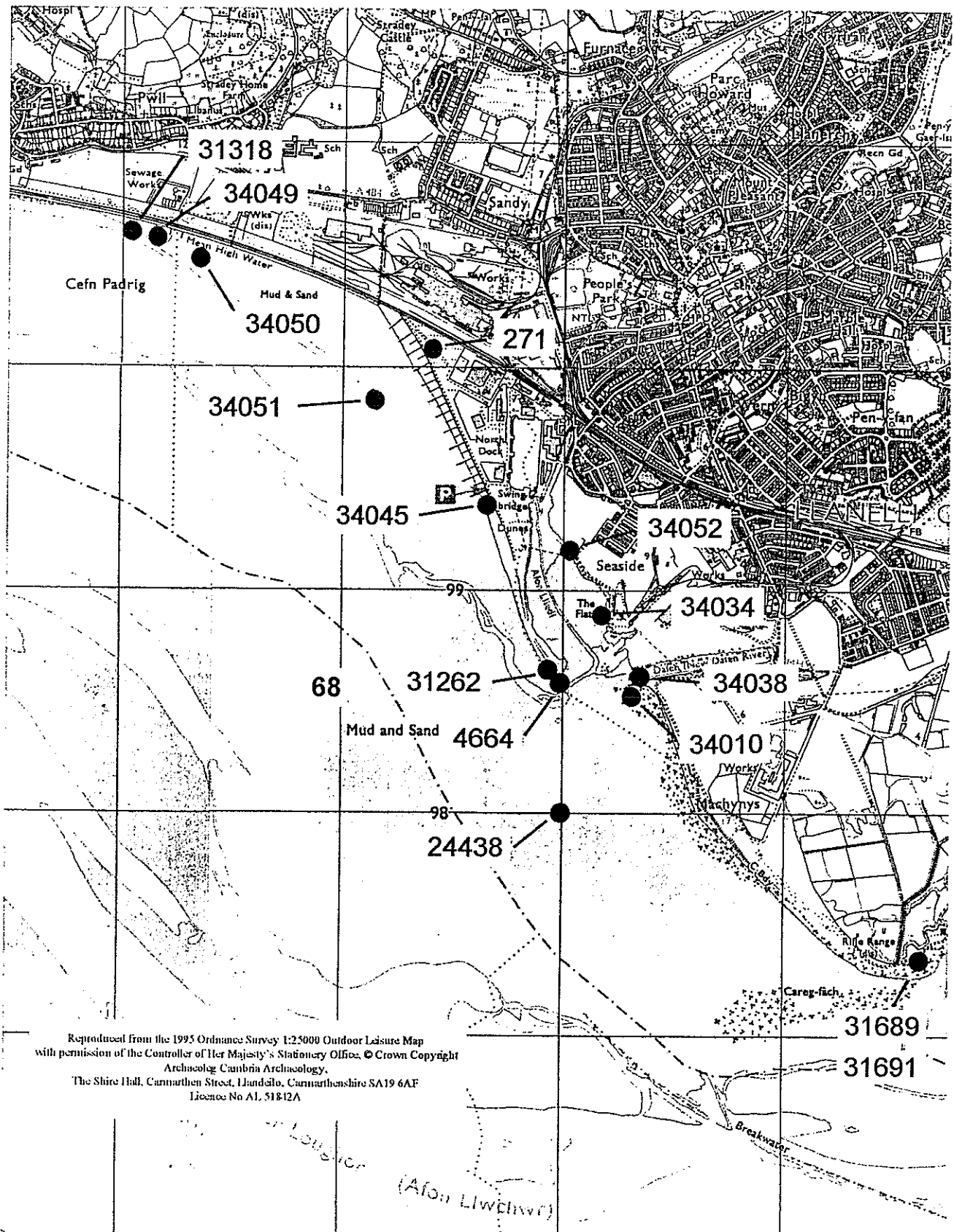
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition	Importance	Erosion class	Status	Threats	Action
271										
4664	SS 50009857	Ship channel	Harbour light	Post Med	B	D	1			
24438	SS 5098		Earthwork	Post Med	U	U	5			
31262	SS49949863		Groyne	Post Med	U	U	5			
31318	SN 48000064		Submerged forest	Neolithic?	D	B	5			Survey and environmental sampling
31689	SS 51729749	Rifle butt	O.Struct.	Modern	C	D	2			
31691	SS 51629737	Rifle butt	O.Struct.	Modern	C	D	2			
34010	SS 50309857	Possible shipwreck site, not visible during survey.	Breakwater	Post Med	U	U	2			
34034	SS 50149892		Shipwreck	Post Med	U	U	2			
34038	SS 50149859		Harbour	Post Med	C	D	2			
34045	SS 49629940		Groyne	Post Med	D	D	3			
34049	SN 48150060		Groyne	Post Med	C	D	5			
34050	SN 48350051		Fishtrap	Unknown	C	D	5			
34051	SN 49179985		Fishtrap	Unknown	C	D	5			
34052	SN 50259922		Building	Post Med	U	U	1			

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
68	13.5km	man-made wall	man-made structures	mud	5	5038; 5052; 5850; 5042; 5851; 5044; 5046; 5048; 5050; 5053; 5054; 5055; 5056; 5057; 5058; 5059; 5060; 5061; 5062; 5063; 5064; 5065; 5066



Map 22:

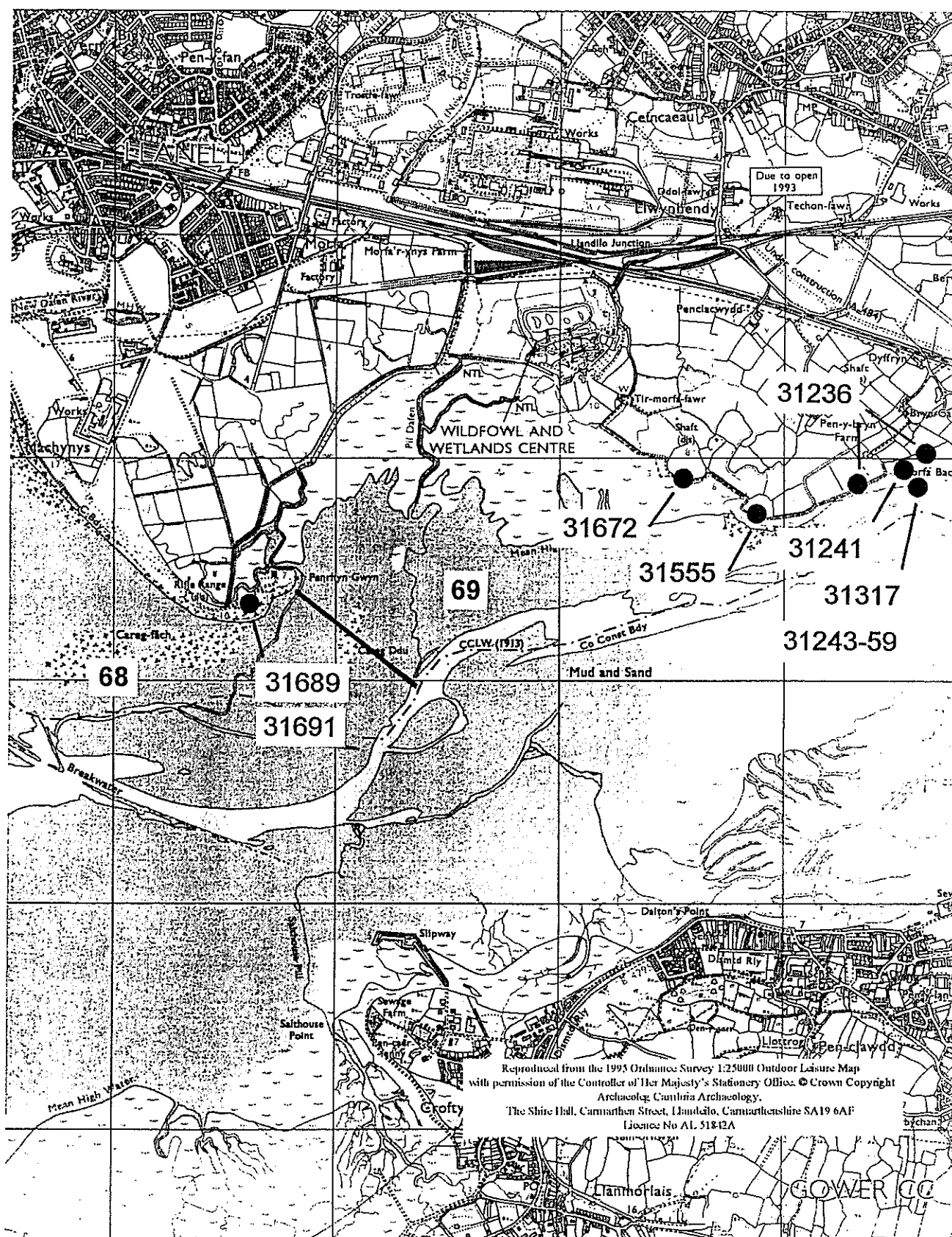
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition	Importance	Erosion class	Status	Threats	Action
31236	SS 500999	Sea defence	Linear bank	Post Med	R	D	2			
31241	SS 54479793	Bacas canal	Canal	Post Med	C	C	2			
31243	SS 54499781	part of large peat layer, includes 31245 and 31246	Peat shelf	Neolithic	D	B	5			
31244	SS 54369775		Fishtrap	Post Med	D	C	5			
31245	SS 54299769		Peat shelf	Neolithic	D	B	5			
31246	SS 54199770		Peat shelf	Neolithic	D	B	5			
31247	SS 54229769		Fishtrap	Post Med	D	C	5			
31248	SS 54239771		Fishtrap	Post Med	D	C	5			
31249	SS 54229772		Fishtrap	Post Med	D	C	5			
31250	SS 54439774		Fishtrap	Post Med	D	C	5			
31251	SS 54249772		Fishtrap	Post Med	D	C	5			
31252	SS 54359773		Fishtrap	Post Med	D	C	5			
31253	SS 54349773		Fishtrap	Post Med	D	C	5			
31254	SS 54339772		Fishtrap	Post Med	D	C	5			
31255	SS 54319771		Fishtrap	Post Med	D	C	5			
31256	SS 54329772		Fishtrap	Post Med	D	C	5			
31257	SS 54299770		Fishtrap	Post Med	D	C	5			
31258	SS 54229766		Fishtrap	Post Med	D	C	5			
31259	SS 54269773		Fishtrap	Post Med	D	C	5			
31317	SS 54199771	Submerged forest	Peat shelf	Neolithic	D	B	5			
31555	SS 53929775		Lime Kiln	Post Med	E	E	1			
31672	SS 53559792	Sea defence	Linear bank	Post Med	R	D	2			
31689	SS 51729749	Rifle butt	O.Struct.	Modern	C	D	2			
31691	SS 51629737	Rifle butt	O.Struct.	Modern	C	D	2			

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
68	13.5km	man-made wall/bank	man-made structures	mud	5	5061; 5062; 5063; 5064; 5065; 5066
69	7.37km	man-made wall/bank	man-made structure	marsh	4	5067; 5068; 5069; 5070; 5074; 5080



Map 23:

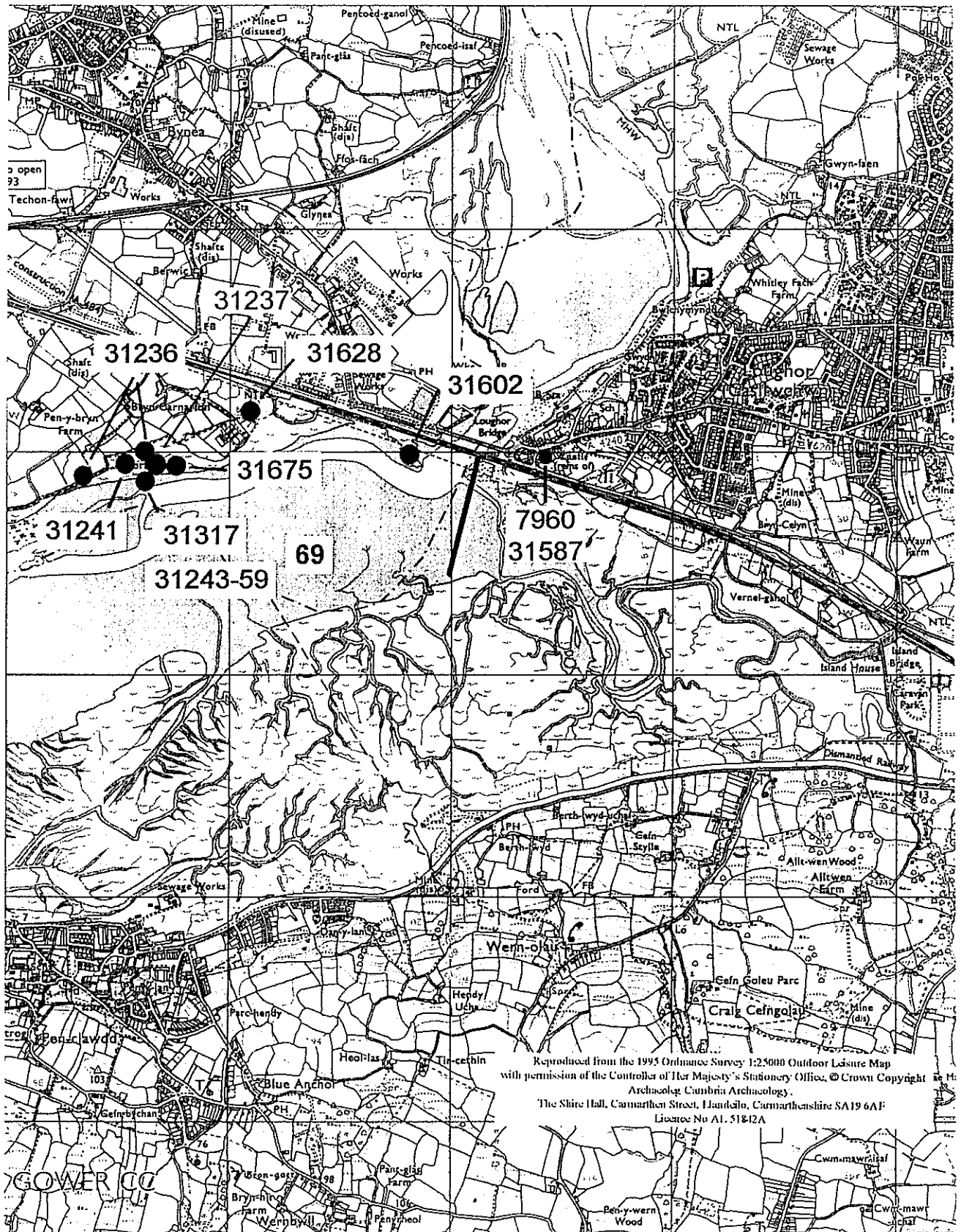
Archaeological sites

Bold PRNs = new sites

PRN	NGR	Description	Type	Period	Condition			Threats	Action
Importance									
Erosion class									
Status									
7960	SN 56409800	Site of Roman fort	Fort	Roman	E	A	1	SAM	
31236	SS 500999	Sea defence	Linear bank	Post Med	R	D	2		
31237	SS 54879793	shell midden containing	refuse midden	prehistoric	D	B	5		monitoring and removal of material liable to loss through tide action survey
31241	SS 54479793	Bacas canal	Canal	Post Med	C	C	2	The canal is being used as a dump for debris from demolished buildings	
31243	SS 54499781		Peat shelf	Neolithic	D	B	5		
31244	SS 54369775		Fishtrap	Post Med	D	C	5		
31245	SS 54299769		Peat shelf	Neolithic	D	B	5		
31246	SS 54199770		Peat shelf	Neolithic	D	B	5		
31247	SS 54229769		Fishtrap	Post Med	D	C	5		
31248	SS 54239771		Fishtrap	Post Med	D	C	5		
31249	SS 54229772		Fishtrap	Post Med	D	C	5		
31250	SS 54439774		Fishtrap	Post Med	D	C	5		
31251	SS 54249772		Fishtrap	Post Med	D	C	5		
31252	SS 54359773		Fishtrap	Post Med	D	C	5		
31253	SS 54349773		Fishtrap	Post Med	D	C	5		
31254	SS 54339772		Fishtrap	Post Med	D	C	5		
31255	SS 54319771		Fishtrap	Post Med	D	C	5		
31256	SS 54329772		Fishtrap	Post Med	D	C	5		
31257	SS 54299770		Fishtrap	Post Med	D	C	5		
31258	SS 54229766		Fishtrap	Post Med	D	C	5		
31259	SS 54269773		Fishtrap	Post Med	D	C	5		
31317	SS 54199771	Submerged forest	Peat shelf	Neolithic	D	B	5		
31587	SN 56409800	Loughor Castle	Castle	Medieval	C	A	1	SAM	
31602	SS 55809800	Sea defence	Linear bank	Post Med	E	E	4		
31628	SS 51499813		Canal?	Post Med	U	U	1		
31675	SS 54749791		Drainage	Post Med?	D	D	5		

Coastal units

No.	Length	Coast edge type	Land edge type	Foreshore type	Erosional class	WLGLS code
69	7.37km	man-made wall	man-made structure	marsh	4	5082; 5084



APPENDIX ONE: WELSH OFFICE GENERAL LEVEL OF SERVICE SURVEY

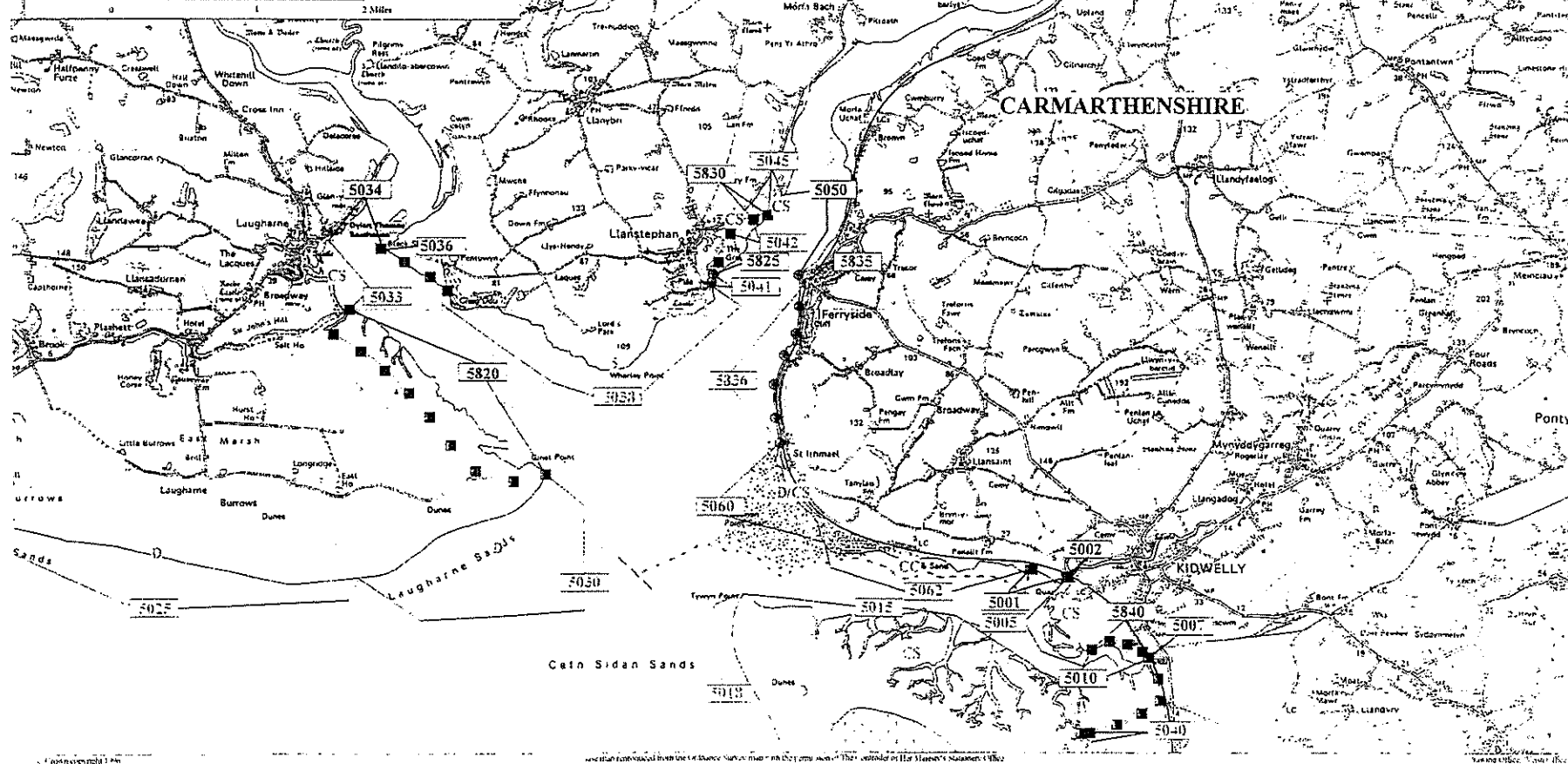
W.21.5030	35	Laugharne Burrows	M	SN 3083/0663 3220/0792	2,900	Dunes	S	Med	G	D	E
W.21.5820	35	Ginst Point to Railgate point	M?	SN 3220/0792 3073/1000	3,200	Embankment Clay/silt shore	SD	Lw	G	D	E
W.21.5033	35	Laugharne	P	SN 3073/1000 3047/1087	800	Clay/silt shore	S	Lw	C	C	E
W.21.5034	35	River Taf Sch.4 Bdy.		SN 3047/1087 3113/1077	700						
W.21.5036	35	Black Scar to Pentwyn	P	SN 3113/1077 3197/1024	1,000	Embankment	SD	Lw	F	E	E
W.21.5038	35	Wharley Point	P	SN 3197/1024 3530/1030	3,400	Soft rock shore	H	Med	D	E	E
W.21.5041	35	Llanstephan, South	D/P	SN 3530/1030 3534/1044	150	Sea Wall	CP	Lw	B	C	D
W.21.5825	35	Llanstephan	D	SN 3534/1044 3556/1095	500	Embankment Revetment	SD	Lw	B	C	D
W.21.5042	35	Llanstephan, North	P	SN 3556/1095 3610/1136	300	Clay/silt shore	S	Lw	D	E	E
W.21.5045	35	Ferry Point 2		SN 3600/1120 3610/1136	250	Clay/silt shore	S				
W.21.5050	35	River Towy Sch.4 Bdy.		SN 3610/1136 3654/1050	960						
W.21.5835	35	Ferryville Village	D	SN 3654/1050 3652/1030	150	Revetment Groynes	CP	Med	B	C	D
W.21.5836	35	Ferryville to St Ishmaels	R	SN 3652/1030 3618/0831	2,000	Revetment	CP	Hi	B	C	D
W.21.5060	35	St Ishmaels	P	SN 3618/0831 3673/0707	1,300	Dunes Clay/silt shore	S	Hi	A	E	D
W.21.5062	35	St Ishmaels Caravan Site	P	SN 3673/0707 3938/0672	2,600	Clay/silt shore	S	Med	C	E	D

COASTAL SURVEY - WALES

SHEET 35

Soft natural coast		Coast Protection	③ ③ ③ ③
Dunes	D	Breakwater	=====
Shingle bank	SB	Sea Defence	■ ■ ■ ■
Clay/silt shore	CS	Unitary Authority Boundary	=====
Clay cliff	CC		
Hard natural coast			
Soft rock	S		
Hard rock	H		

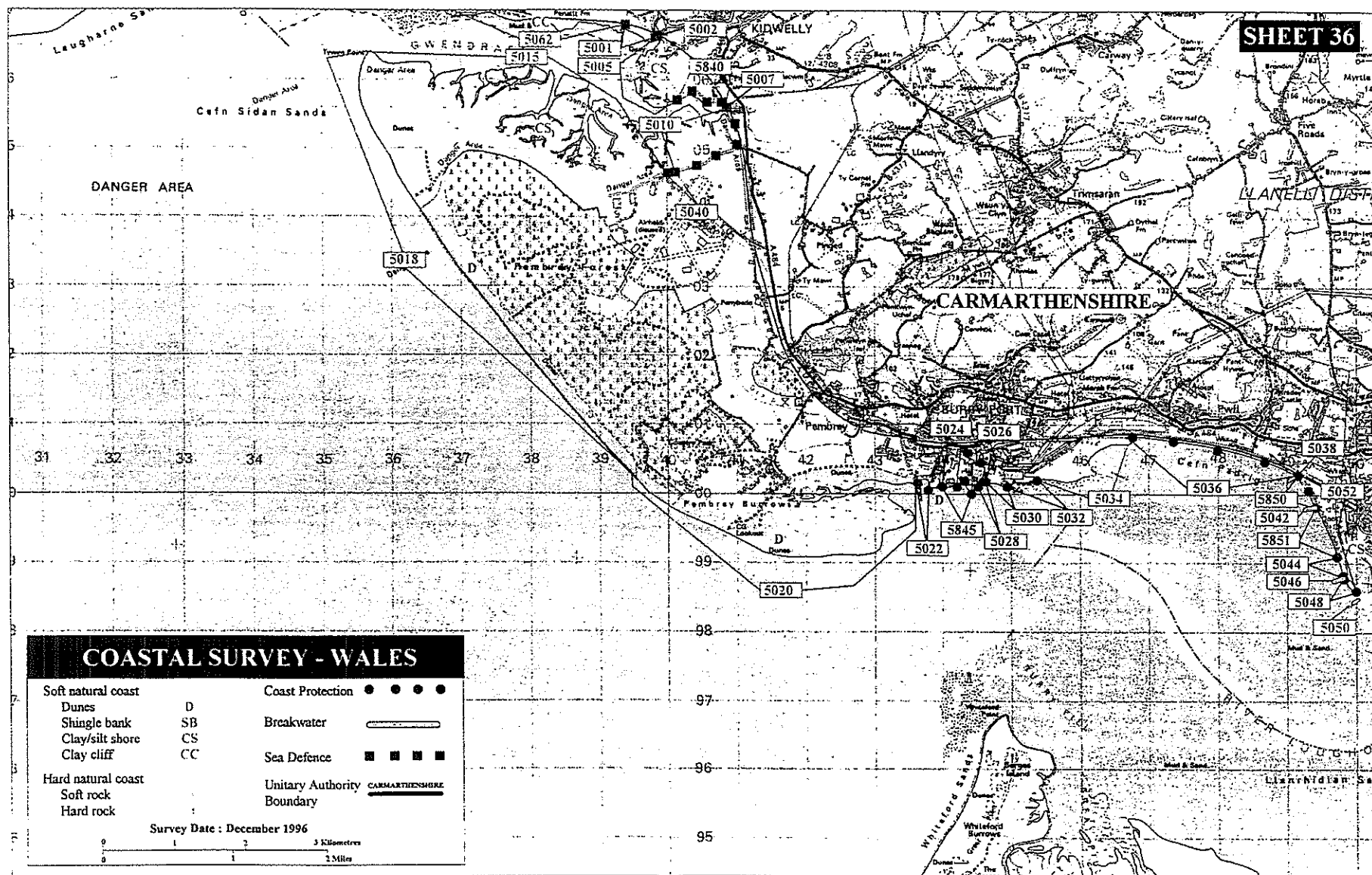
0 1 2 3 Kilometres
0 1 2 Miles



Coastal Survey 1997-98: Carmarthen Bay, Ginst Point to Longhor

GENERAL LEVEL SERVICE FOR CARMARTHENSHIRE

Code	Map No.	Location	Owner	Grid reference start finish	Length (m)	Type of protection	Class	Degree of exp.	Land type	Prop. at risk Dmst. Comm.
W.24.5001	35	Kidwelly Quay	D	SN 3938/0672 3983/0663	500	Embankment	SD	Lw	D	E E
W.24.5002	36	Gwendraeth Fach Outfall	P	SN 3983/0663 3986/0662	60	Sea Wall	SD	Lw	D	
W.24.5005	36	Kidwelly Marsh	P	SN 3986/0662 4015/0570	1,600	Clay/silt shore	S	Lw	E	E E
W.24.5840	36	Kidwelly Gwendraeth Fawr	N/T	SN 4015/0570 4086/0560	660	Embankment Sea Wall	SD	Lw	C	D D
W.24.5007	36	Gwendraeth Fawr outfall	N?	SN 4087/0560 4088/0558	30	Sea Wall	SD	Lw	C	D D
W.24.5010	36	Gwendraeth Marsh	P	SN 4088/0558 4012/0465	1,200	Clay/silt shore Embankment	SD	Lw	E	E E
W.24.5040	36	Pembrey Sea Outfall	N	SN 4012/0465 4001/0464	30	Embankment	SD	Lw	C	C C
W.24.5015	36	Gwendraeth Saltings	P	SN 4001/0464 3568/0640	5,000	Clay/silt shore	S	Lw	E	E E
W.24.5018	36	Pembrey Forest	M	SN 3568/0640 3947/0029	7,300	Dunes	S	Hi	F	E E
W.24.5020	36	Pembrey Dunes and Country Park	D	SN 3947/0029 4360/0014	4,700	Dunes Clay/silt shore	S	Hi	E	E E
W.24.5022	36	Pembrey Harbour (disused)	D	SN 4360/0014 4379/0005	350	Revetment Sea Wall	CP	Lw	G	E E
W.24.5024	36	Pembrey Harbour Dunes	D	SN 4379/0005 4400/0011	250	Dunes	S	Med	E	E E
W.24.5845	36	Burry Port, West of Harbour	D	SN 4400/0011 4443/0000	510	Revetment Dunes	CP	Med	B	B C
W.24.5026	36	Burry Port, Harbour	D	SN 4443/0000 4453/0010	800	Sea Wall Revetment	CP	Lw	C	C C
W.24.5028	36	Burry Port, East Pier	D	SN 4453/0010 4464/0018	150	Revetment	CP	Med	C	C C
W.24.5030	36	Burry Port, Chemical Works	D	SN 4464/0018 4495/0010	320	Revetment Sea Wall	CP	Med	B	E C
W.24.5032	36	Burry Port, Old Power Station	D	SN 4495/0010 4540/0020	500	Revetment	CP	Med	B	E C
W.24.5034	36	Twyn Bach	C?	SN 4540/0020 4673/0080	1,800	Soft rock shore	H	Med	B	D E
W.24.5036	36	Cefn Padrig Railway Wall	R	SN 4673/0080 4915/0028	2,450	Sea Wall Apron	CP	Med	A	C C
W.24.5038	37	Northern Bastion	D	SN 4915/0028 4917/0023	40	Breakwater	CP	Med	B	E A
W.24.5850	37	South Beach Llanelli 1	D	SN 4917/0023 4940/9980	500	Sea Wall Recharge	CP	Med	B	E A
W.24.5042	37	Northern Breakwater	D	SN 4940/9980 4941/9978	40	Breakwater	CP	Med	B	E A
W.24.5851	37	South Beach Llanelli 2	D	SN 4941/9978 4973/9910	800	Sea Wall Recharge	CP	Med	B	E A
W.24.5044	37	South Beach Llanelli 3	D	SN 4973/9910 4985/9875	300	Dunes Recharge	CP	Med	B	E A
W.24.5046	37	Southern Breakwater	D	SN 4985/9875 4986/9874	40	Breakwater	CP	Med	B	E A
W.24.5048	37	South Beach Llanelli 4	D	SN 4986/9874 4997/9859	300	Dunes Recharge	CP	Med	B	E A
W.24.5050	37	Southern Bastion	D	SN 4997/9859 4998/9857	40	Breakwater	CP	Med	B	E A

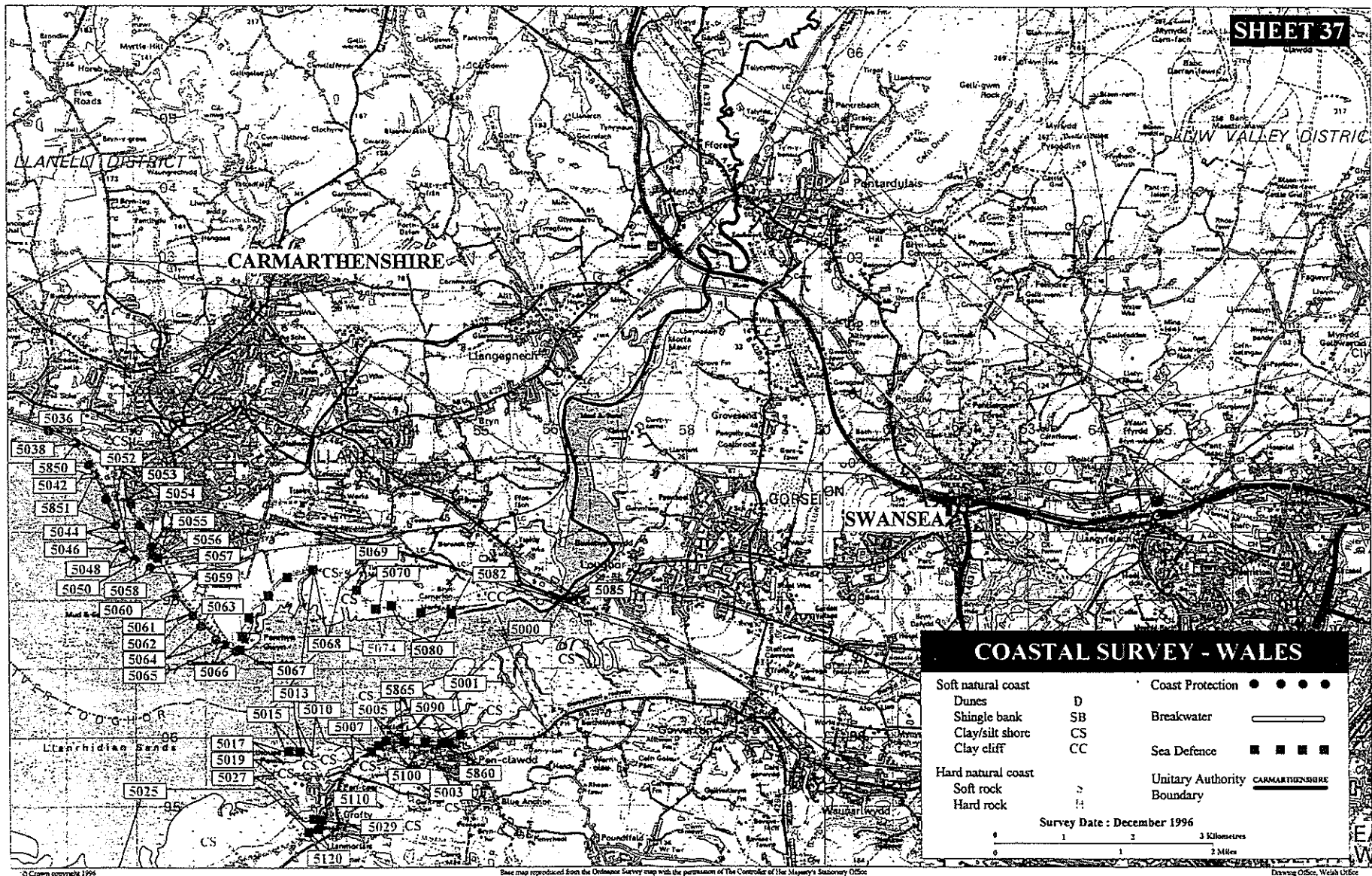


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Drawing Office, Welsh Office

W.24.5052	37	Afon Lliedi Flats	D	SN 4998/9857 4885/9940	900	Clay/silt shore	S	Lw	B	E	A
W.24.5053	37	North Dock Entrance		SN 4885/9940 4895/9940	100						
W.24.5054	37	Seaside	D	SN 4895/9940 5020/9880	700	Revetment	CP	Lw	B	B	B
W.24.5055	37	Llanelli Haven	D	SN 5020/9880 5035/9862	280	Revetment	CP	Lw	B	B	B
W.24.5056	37	Afon Dafen	D	SN 5035/9862 5038/9862	15	Other artif. ptn.	SD	Lw	B	B	B
W.24.5057	37	Dafen Training Wall	D	SN 5038/9862 5032/9857	110	Sea Wall	CP	Med	A	A	B
W.24.5058	37	Training Wall Bastion	D	SN 5032/9857 5034/9857	20	Breakwater	CP	Med	A	A	B
W.24.5059	37	Machynys Park	D	SN 5034/9857 5055/9810	660	Recharge Other artif. ptn.	CP	Med	A	A	B
W.24.5060	37	Machynys A Breakwater	D	SN 5055/9810 5056/9800	30	Breakwater	CP	Med	A	A	B
W.24.5061	37	Penrhyn Park 1	D	SN 5056/9800 5081/9777	410	Recharge Other artif. ptn.	CP	Med	A	A	B
W.24.5062	37	Machynys B Breakwater	D	SN 5081/9777 5083/9776	40	Breakwater	CP	Med	A	A	B
W.24.5063	37	Penrhyn Park 2	D	SN 5083/9776 5095/9762	120	Recharge Revetment	CP	Lw	B	B	C
W.24.5064	37	Penrhyn Park 3	D	SN 5095/9762 5117/9742	400	Revetment	CP	Lw	B	B	C
W.24.5065	37	Penrhyn Gwyn Bastion	D	SN 5117/9742 5119/9740	30	Breakwater	CP	Lw	B	B	C
W.24.5066	37	Penrhyn Point	D	SN 5119/9740 5136/9732	200	Revetment	CP	Lw	B	B	C
W.24.5067	37	Machynys Sea Wall	N	SS 5136/9732 5258/9845	1,600	Sea Wall Embankment	SD	Lw	B	A	A
W.24.5068	37	Machynys to Lwyn Hendy Central	N	SS 5258/9845 5298/9820	440	Clay/silt shore	S	Lw	B	A	A
W.24.5069	37	Tir Morfa Fawr	P	SS 5298/9820 5318/9816	200	Clay/silt shore	S	Lw	B	A	A
W.24.5070	37	Machynys- LLwynhendy	N	SS 5318/9816 5349/9800	330	Sea Wall Embankment	SD	Lw	B	A	A
W.24.5074	37	Ty'r Morfa	P	SS 5349/9800 5367/9793	200	Soft rock shore	H	Lw	B	A	A
W.24.5080	37	Machynys, Pen-y-bryn Farm	N	SS 5367/9793 5456/9780	960	Sea Wall Embankment	SD	Lw	B	A	A
W.24.5082	37	Morfa Bacas, LLwynhendy	P	SS 5456/9780 5600/9803	1,420	Clay/silt shore	S	Lw	B	A	A
W.24.5085	37	Llougher Bridge Sch.4 Bdy.		SS 5600/9803 5614/9798	150						



APPENDIX TWO: RECIPIENTS OF THIS REPORT

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Mr. H. T. Morgan, Secretary, Carmarthen Bay Coastal Engineering Group, Assistant Director of Environment, Llanstephan Road, Johnstown, Carmarthen SA31 3LZ.

Mr C. Delaney, Carmarthenshire County Museums Officer, Carmarthen Museum, Bishop's Palace, Abergwili. SA31 2JG.

Mrs J. Gammon, Carmarthen Library, Reference Section, St Peter Street, Carmarthen.

Mr. G. Phillips, Project Director, Millenium Coastal Park Project, North Dock, Llanelli SA15 2LF.

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Royal Commission on Ancient and Historic Monuments for Wales

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