

Nomination of the
BLAENAVON
INDUSTRIAL LANDSCAPE
for inclusion in the
WORLD HERITAGE LIST



TORFAEN
COUNTY
BOROUGH



BWRDEISTREF
SIROL
TORFAEN



CADW

WELSH HISTORIC MONUMENTS



FOREWORD



At the beginning of April 1999 the Government announced that the Blaenavon Industrial Landscape and the Pont-Cysyllte Aqueduct, near Wrexham, were among the twenty-five cultural and natural sites to be included on the United Kingdom's new Tentative List of sites for future nomination for World Heritage status. Seventeen sites from the United Kingdom and the Overseas Territories have already been inscribed on the World Heritage List including, from Wales, the great thirteenth century castles built by King Edward I at Caernarfon, Conwy, Harlech and Beaumaris and the associated town walls at Caernarfon and Conwy.

The Blaenavon Industrial Landscape is the first site from the United Kingdom's new Tentative List to be nominated for World Heritage status. South Wales played a fundamental role in the development of the world's first Industrial Revolution and nowhere is this role better illustrated than in the area around Blaenavon. Here we have one of the finest examples in the world of a landscape created by coalmining and ironmaking in the late eighteenth and nineteenth centuries. When built in 1789, Blaenavon Ironworks with its three blast furnaces was one of the largest ironworks in the world. The rapid industrialisation which followed is still tangible in the extensive landscape which served the ironworks, created by generations of men, women and children who dug coal and iron, quarried limestone, planned primitive railways and canals, and established new communities in this previously barren setting. Later, in 1878, it was at Blaenavon that Sidney Gilchrist Thomas and his cousin, Percy Carlyle Gilchrist, discovered a way of eliminating phosphorus from iron ore to make steel, thus playing a major part in creating the modern world, opening up vast reserves of phosphoric ore to steel production.

The United Kingdom Government is fully committed to the World Heritage Convention and it is particularly appropriate that the timing of this nomination, which has my full support, coincides with the creation of the new National Assembly for Wales, a momentous landmark in the political and cultural development of our nation.

Finally, I would like to thank Torfaen County Borough Council for all the work which they have put into preparing this nomination document.

The Right Hon. Alun Michael
Secretary of State for Wales

PREFACE

From the mid 18th Century the people who lived in and around Blaenavon played a leading role in the United Kingdom iron and coal industries and helped change the world through the Industrial Revolution.

As representatives of the people and of leading heritage bodies in Wales, we are committed to work together to provide effective stewardship of the Blaenavon Industrial Landscape so that this unique experience will be conserved for future generations to appreciate in the new millennium.

Increasing recognition of its extraordinary past is helping to change the perception of our community. This is greatly assisting in the sensitive regeneration of the area which suffered so badly, both economically and socially, following the decline of the iron and coal industries. Our proposals for the area have been developed by a wide partnership of interests in close consultation with local people.

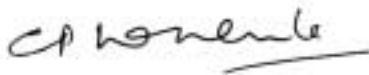
We hope that this nomination for World Heritage Site Status will be looked upon favourably by UNESCO and provide international appreciation of Blaenavon's past and encouragement for its future.



B E Smith
Leader
Torfaen County Borough Council



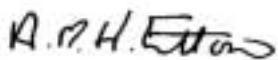
A Southall
Director
National Museums & Galleries of Wales



C P W White
Leader
Monmouthshire County Council



P Broomhead
Director
National Trust, Wales



A M H Fitton
National Park Officer
Brecon Beacons National Park

Blaenavon Industrial Landscape



Blaenavon Industrial Landscape - Area of early mineral extraction at Pen-fford-goch
©Crown Copyright: RCAHMW

This document has been prepared by Torfaen County Borough Council, with expert contributions by Cadw: Welsh Historic Monuments, the Royal Commission on the Ancient and Historical Monuments of Wales, and Dr Barrie Trinder of the University of Northampton. The assistance of the other members of the Blaenavon Partnership is also gratefully acknowledged.

WORLD HERITAGE LIST

Nomination Form

Convention concerning the protection of the world cultural and natural heritage

Under the terms of the Convention concerning the Protection of the World Cultural and Natural Heritage, adopted by the General Conference of UNESCO in 1972, the Intergovernmental Committee for the Protection of the World Cultural and Natural Heritage, called 'the World Heritage Committee' shall establish, under the title of 'World Heritage List', a list of properties forming part of the cultural and natural heritage which it considers as having outstanding universal value in terms of such criteria as it shall have established.

The purpose of this form is to enable States Parties to submit to the World Heritage Committee nominations of properties situated in their territory and suitable for inclusion in the World Heritage List.

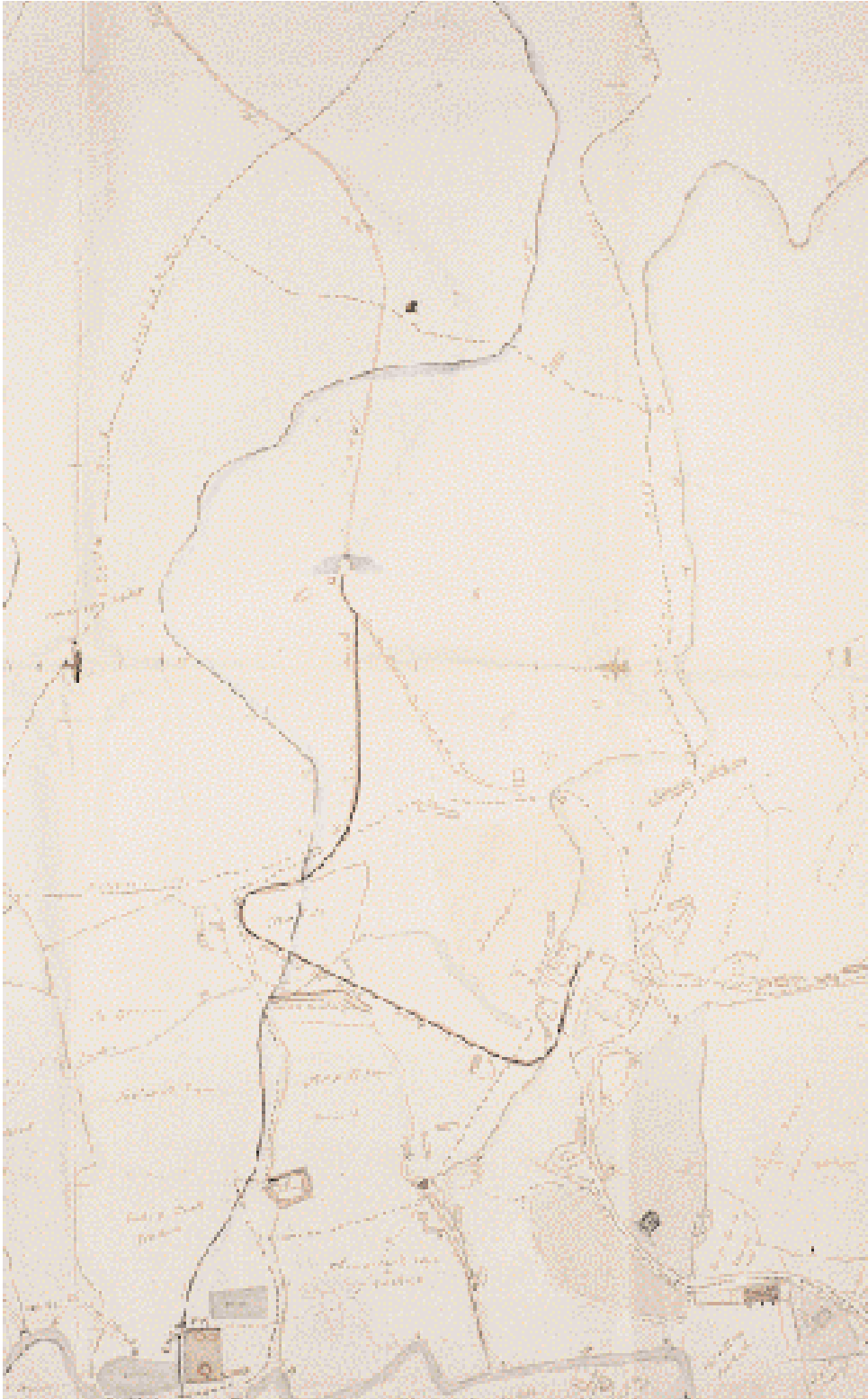
This 'Nomination Document' has been prepared in accordance with the 'Format for the nomination of cultural and natural properties for inscription on the World Heritage List' issued by UNESCO.

The form has been completed in English and is sent in three copies to:-

The Secretariat
World Heritage Committee
Division of Cultural Heritage
UNESCO
7 Place de Fontenoy
75352 Paris 07 SP
France

UNITED NATIONAL EDUCATIONAL SCIENTIFIC AND CULTURAL ORGANISATION

Blaenavon Industrial Landscape



A detail from Thomas Deacon's 1819 map of Blaenavon. The Ironworks' furnaces are shown by numbers in the lower part of the map with mineral workings above.
Gwent Records Office

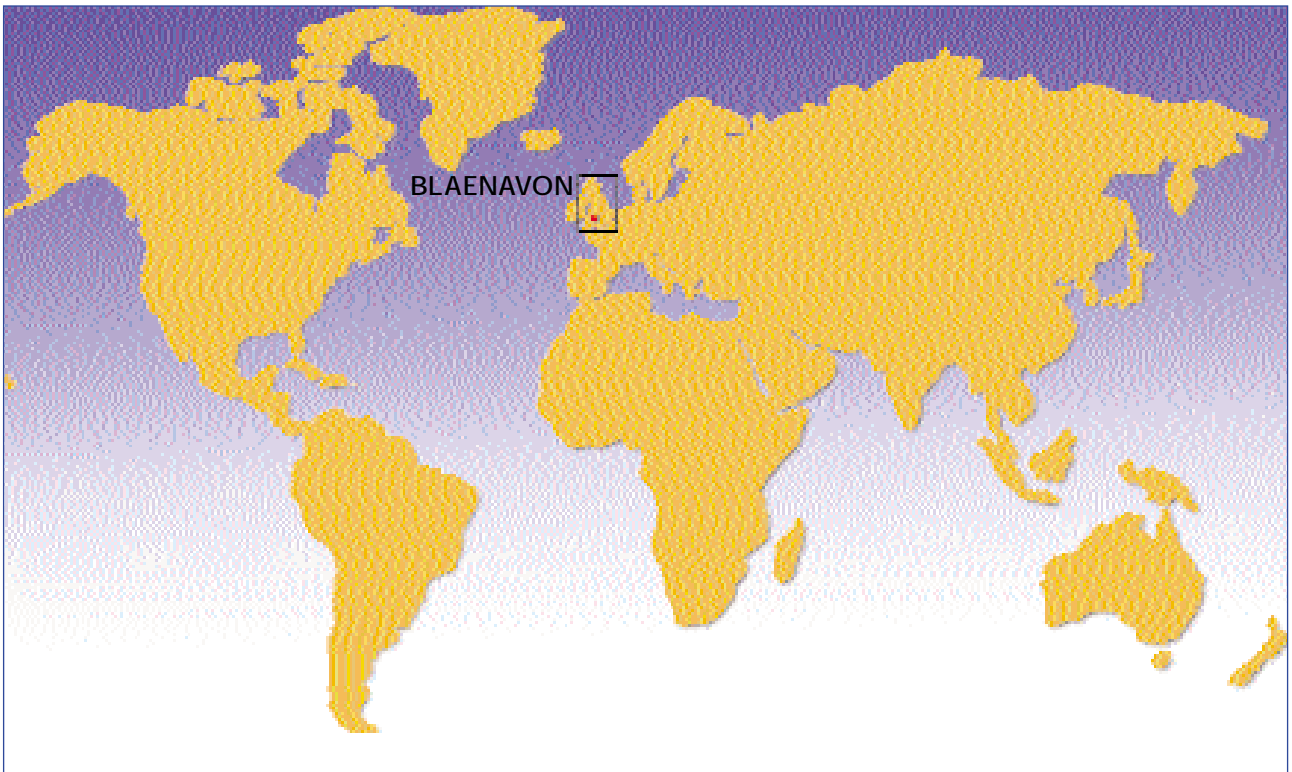
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1 IDENTIFICATION OF PROPERTY

1(a) Country: UNITED KINGDOM

1(b) State/Province or Region: WALES

1(c) Name of Property: BLAENAVON INDUSTRIAL LANDSCAPE



Blaenavon Industrial Landscape in the world

Blaenavon Industrial Landscape

1(d) Location

The Blaenavon Industrial Landscape, on the north eastern rim of the South Wales Coalfield, is located some forty kilometres north east of Cardiff, the capital city of Wales.

The nominated site 'Blaenavon Industrial Landscape' takes its name from the town of Blaenavon, the main settlement within the heritage landscape. Blaenavon (translated from the Welsh as 'head of the river') is, as the name suggests, at the head of the Afon Lwyd, or grey river.

Blaenavon Industrial Landscape is a mountain landscape showing evidence of extensive coal mining and ironmaking during the Industrial Revolution. There are two major preserved sites: Blaenavon Ironworks, which is a Scheduled Ancient Monument in state care, and Big Pit, an historic coal mine and museum in the care of the National Museums and Galleries of Wales. These sites are set in a relict or fossil landscape of inter-dependent mineral extraction, manufacturing, transport and settlement. The total landscape includes a range of Scheduled Ancient Monuments of National Importance, many Listed Buildings of Special Architectural or Historic Interest and the Blaenavon and Cwmavon Conservation Areas. There are also four Sites of Special Scientific Interest, declared because of their ecological significance. All of these enjoy statutory protection.

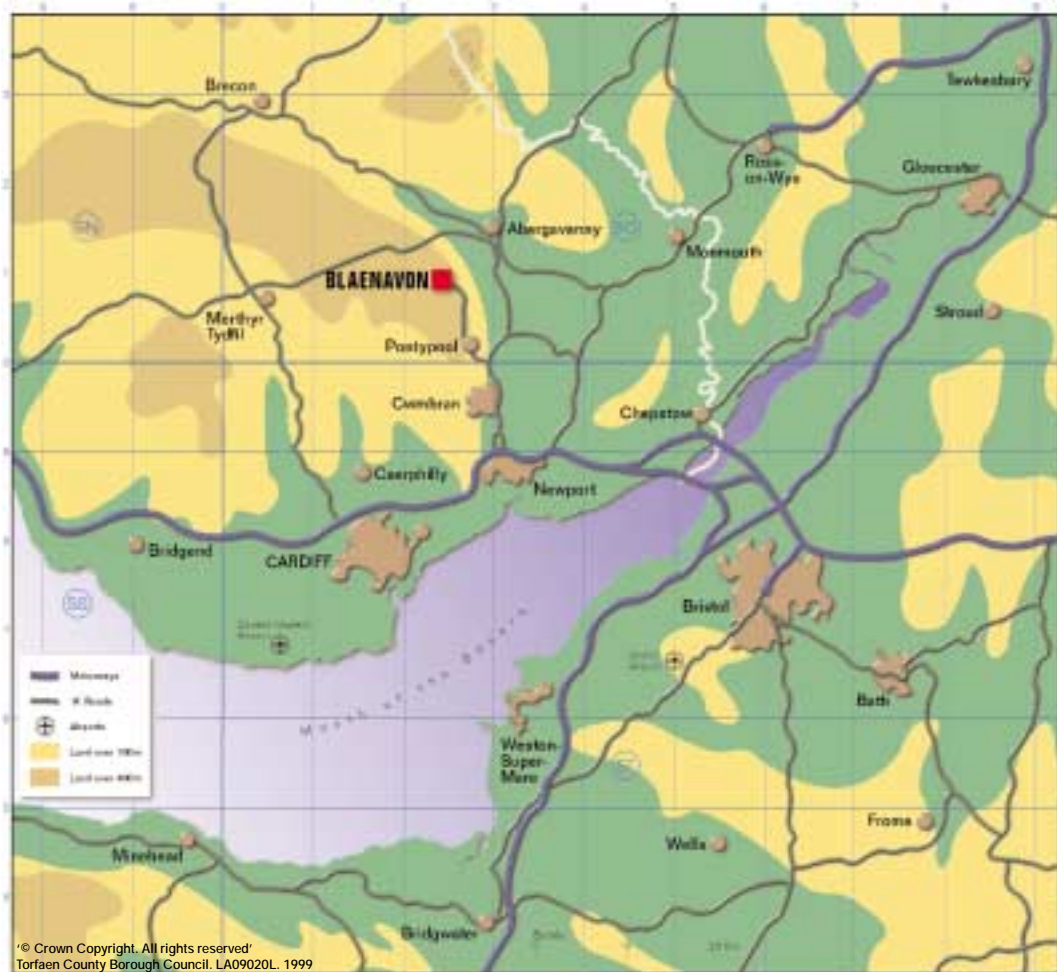


Blaenavon in United Kingdom context

Nomination Document

The geographical co-ordinates and national grid references of the main features of the industrial landscape are:

	Geographical			National Grid
• Blaenavon Ironworks	Latitude	51°	46' 35"	SO 249 093
	Longitude	3°	5' 17"	
• Big Pit Mining Museum	Latitude	51°	46' 22"	SO 238 088
	Longitude	3°	6' 13"	
• Blaenavon Town Centre (Workmen's Hall and Institute)	Latitude	51°	46' 20"	SO 252 088
	Longitude	3°	5' 5"	
• Garn-Ddyrys Forge	Latitude	51°	48' 3"	SO 258 118
	Longitude	3°	4' 36"	
• Brecknock and Abergavenny Canal (Llanfoist Wharf)	Latitude	51°	48' 7"	SO 285 130
	Longitude	3°	2' 16"	



Blaenavon in regional context

1(e) *Boundary of Nominated Site*

The boundaries of the site represent the full extent of the historic landscape associated with Blaenavon Ironworks. This is defined principally by the boundaries of land historically leased or purchased to provide the minerals, energy and infrastructure for the Ironworks, and by additional land used in direct association with the Ironworks or its communities. The boundary has been modified where appropriate to conform to identifiable landscape features or to exclude areas of land which have suffered loss of authentic features or were not utilised by the Ironworks. This fulfils the boundary criteria for a cultural landscape to be included on the World Heritage List, that its extent should be large enough to represent the totality of the cultural landscape that it illustrates. As this is a large landscape in which all main features can be viewed in context, no additional buffer zones are proposed.

The leasehold and freehold boundaries of the Ironworks' properties (shown on page 22) are followed on the east of the site from Cwmavon to the Bloreng, with the addition of a narrow incursion at Carn-y-gorfydd. At the north-east the site extends to include the Brecknock and Abergavenny Canal, on which the Ironworks leased two wharves for the transportation of its goods, at Llanfoist and Govilon. The canal bank, and then the road from Govilon across Cwm Llanwenarth, form the northern boundary, rising to meet the northern extent of land leased by the company at Gilwern Hill. At the west the boundary continues southwards following the historic lease boundary then an access road to exclude Ryan's tip, which has been subject to recent re-working. From here, the boundary follows the track past the Whistle Inn which was traditionally regarded as the normal working limits of the Blaenavon enterprise. At the south-west, the boundary is the ridge-top of Coity Mountain, beyond which land leased by the company was not exploited for Blaenavon Ironworks.

1(f) *Area of Nominated Site*

The nominated site measures approximately eight kilometres north to south and six kilometres east to west. The area of the nominated site is 32.9 square kilometres.

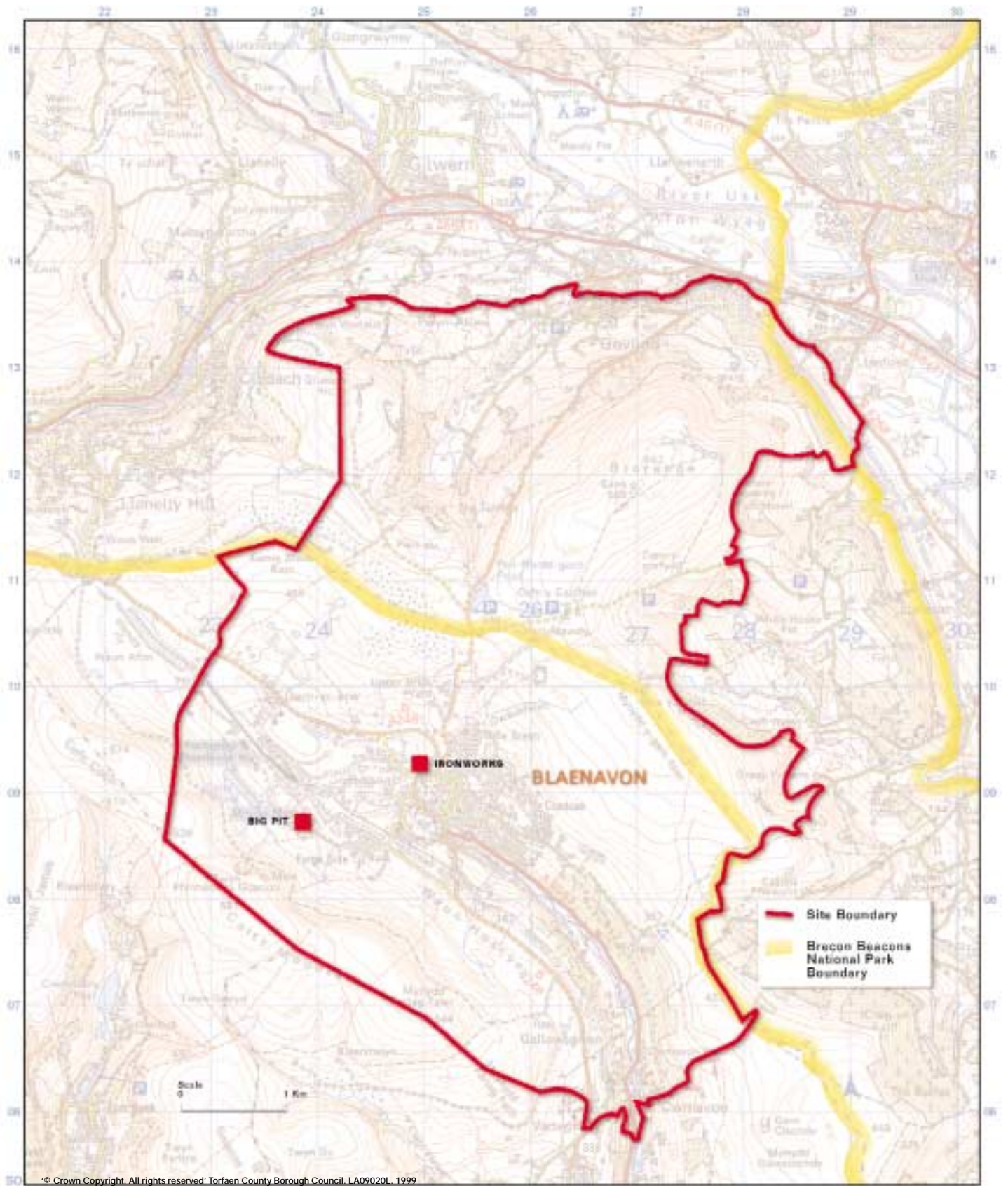
The site includes extensive areas of mountain land. The highest points are Coity Mountain (581 metres), Bloreng Mountain (559 metres) and Gilwern Hill (441 metres). The lowest levels of the site are below the Brecknock and Abergavenny Canal at Llanfoist (70 metres) and in the Afon Lwyd valley at Cwmavon (225 metres).

The site lies at the north east corner of the South Wales Coalfield, where coal, iron ore, fireclay and sandstone are found overlaying carboniferous limestone. The limestone outcrops at the edge of the coalfield, beyond which a scarp slope falls rapidly to the lowlands of the Usk Valley. The proximity of these minerals has provided all of the essential raw materials for iron making, and has resulted in a diverse and visually impressive topography.

The focus of the site is the head of the Afon Lwyd river. This includes the major preserved items of Blaenavon Ironworks and Big Pit together with Blaenavon town and the oldest areas of iron and coal extraction between Blaenavon and Pwll-Du.

The site extends over the mountain which defines the Brecon Beacons National Park boundary into the valley of the River Usk. Bloreng Mountain has remains of limestone quarries, primitive railways and Garn-Ddyrys forge on its flanks. Gilwern Hill had quarries which provided limestone, an essential material in the iron making process. Between Bloreng Mountain and Gilwern Hill lies Cwm Llanwenarth, a deeply cut valley which exhibits a pattern of smallholdings, farms and fields which predate the Industrial Revolution.

Nomination Document



Proposed World Heritage Site Boundary

Blaenavon Industrial Landscape

The nominated site falls within two Unitary Council administrative areas:-

Torfaen County Borough Council	1804	hectares
Monmouthshire County Council	1486	hectares
Total	3290	hectares

The Brecon Beacons National Park is the statutory planning authority for 1458.5 hectares of the Monmouthshire administrative area. Therefore, approximately 45% of the nominated site benefits from the special status and protection conferred by National Park designation.



Blaenavon Ironworks in August 1798. The engraving was made from a drawing by Sir Richard Colt Hoare and appeared in Coxe's 'An Historical Tour of Monmouthshire', published in 1801.

©Cadw

2 JUSTIFICATION FOR INSCRIPTION

2(a) Significance of the Blaenavon Industrial Landscape

Iron and Coal were characteristic materials of the Industrial Revolution, and the principal products of the South Wales Valleys, where many settlements came into being with the establishment of mines, ironworks, canals and railways in the eighteenth and nineteenth centuries. The collieries and ironworks of South Wales were for more than 150 years of prime international significance. Through the establishment of a series of carefully planned new ironworks in the late eighteenth and early nineteenth centuries, South Wales became the largest single iron producing region in Britain. The output of pig iron grew from 39,600 tons in 1796 to 666,000 tons in 1852. Iron from Welsh furnaces and forges was employed on railways and for countless other purposes in five continents, while Welsh coal was loaded on to steamships as fuel in numerous distant ports. Skilled migrants took their knowledge and expertise of mining and iron working technology all over the world, together with aspects of the distinctive culture which had evolved in the valleys.

The area around Blaenavon is one of the best examples in the world of a landscape created by coal mining and ironmaking in the late eighteenth century and the early nineteenth century. The parallel development of these industries was one of the principal dynamic forces of the Industrial Revolution. In the major preserved sites of Blaenavon Ironworks and Big Pit, together with the outstanding relict landscape of mineral exploitation, manufacturing, transport, and settlement which surrounds them, can be seen evidence of all the crucial elements of the industrialisation process. These include continued technological advance, the conversion from organic to mineral materials, sustained growth in output, increasing capitalisation of production, regional specialisation, urbanisation, and changing social relations.

The main focus of the area is Blaenavon Ironworks, a site in state care, where there are remains of a works with six blast furnaces in which, from 1789 until 1902, ore was smelted to produce pig iron. When the works was established, it was decided confidently to put into practice the latest technology and industrial organisation. Unlike almost all previous ironworks it was built with three blast furnaces from the start, operated with steam power. It was immediately one of the largest ironworks in the world. With its exceptional range of surviving structures, Blaenavon Ironworks is the best preserved blast furnace complex of its period and type in the world.



*Blaenavon Ironworks,
Furnaces Nos 2, 4 & 5
©Cadw*

Blaenavon Industrial Landscape

The entrepreneurs who established Blaenavon Ironworks in 1789 controlled and exploited an extensive landscape in order to provide the minerals, energy and infrastructure needed for a new ironmaking enterprise which would put into practice the latest methods of the Industrial Revolution. Within a short distance of the Ironworks can

be seen evidence of the sources of all its raw materials. Big Pit, also in state care, is a coal mine sunk by the Blaenavon Company about 1860 which operated until 1980. It is one of only two coal mines in Britain where it is possible for visitors to see authentic underground workings. On the hills north of Blaenavon, extensive evidence can be seen of the methods used to extract iron ore and coal during the first decades of the operation of the ironworks, together with the monumental quarry faces from which the owners of the ironworks obtained limestone. Linking the Ironworks, the ore workings, the quarries and wharves on the Brecknock and Abergavenny Canal is a network of daringly engineered primitive railways, constructed at a time of imaginative innovation in railway technology, which includes Pwll-Du tunnel (2400m long), completed about 1817, the longest railway tunnel built at that date. The area includes the sites of three forges, at Garn-Ddyrys, Cwmavon and Forgeside, at which pig iron from the Blaenavon works was converted to wrought iron. Blaenavon's principal contribution to ironworking technology came in the late 1870s when Percy Gilchrist and Sidney Gilchrist Thomas perfected there a process for making mild steel from pig iron smelted from phosphoric ores.

There was no extensive settlement in the area before the establishment of the Ironworks in 1789. In the town of Blaenavon, south of the

Ironworks, there remain many buildings which are eloquent evidence of the area's industrial past. To be found are the homes of ironmasters and the working community, a church and a school built by the owners of the Ironworks, chapels founded by English-speaking and Welsh-speaking congregations, shops, public houses, and the impressive Workmen's Hall and Institute built in 1894, financed by a levy on the wages of miners and ironworkers. Blaenavon is no longer shrouded in smoke and illuminated by flames and molten metal, but its landscape continues to reflect the whole human experience of industrialisation - capitalist enterprise, philanthropy and exploitation, technological innovation, the drudgery of labour, the determination of workers to establish trades unions, political parties, religious congregations, choirs and sports clubs. Local people appreciate the importance of their history and are involved in its recording, protection and presentation.



*Blaenavon Ironworks. Foundry
and Cast House
©Cadw*

Nomination Document



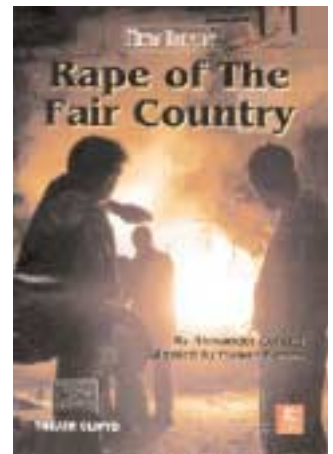
*Foundry workers at
Blaenavon, c1910
copy photograph F Keen*

Blaenavon's historic landscapes and features are extensively protected by statutory means and are actively conserved and interpreted. There is no better place in the world for understanding the social, economic and technological process of industrialisation.

Blaenavon's historical significance is demonstrated by the wide range of published studies of its industrial past (listed in the Bibliography), some written by local authors for local people, and some by distinguished academic scholars from Wales and elsewhere. The popular writer Alexander Cordell (1915-1997) drew inspiration from this area and its iron and coal communities. This socialist novelist, who wrote so passionately about the struggles of Welsh working families, was born into an English colonial family in Sri Lanka. His most famous novel *The Rape of the Fair Country* is set in the Blaenavon landscape and describes the life of an early nineteenth century iron making family during times of social upheaval which culminated in the Chartist uprising in 1839.

Blaenavon's archaeological heritage has received international recognition. In December 1994 it was one of 27 industrial archaeological sites recommended to the World Heritage Assembly by the experts on the Board of TICCIH (The International Committee for the Conservation of the Industrial Heritage), and the integrated industrial area and its canal warehouses have both been included on lists of sites of international importance drawn up by panels of experts on behalf of TICCIH and ICOMOS in order to make recommendations to the World Heritage Committee.

Blaenavon's importance is therefore widely recognised, by local people, by the statutory authorities in Wales, by writers of fiction, by historians and archaeologists, and by the international body that concerns itself with the industrial heritage.



*Programme for 'Rape of the
Fair Country', Cardiff 1998
©Theatr Clwyd*

2(b) *Comparative Analysis: National Context*

The South Wales Valleys form a distinct industrial region. Most of the area was sparsely populated until the latter part of the eighteenth century when ironworks using coal as their fuel were established near to sources of iron ore and limestone at the heads of the Valleys. For a generation or so this was one of the world's principal iron-producing regions. Iron production tended to diminish as supplies of ore became exhausted, and in the latter part of the nineteenth century new works using imported ores were established on the coast, while the Valleys saw a boom in the production of steam coal, which was exported to many countries for firing locomotives and ships. In the 1920s and 1930s the area was characterised by widespread poverty and unemployment, and the closure of many ironworks and collieries. The twentieth century has seen the construction of large steel plants on the coast but ironworking and coal mining has almost completely ceased in the Valleys, only one deep mine and several open cast sites remaining in production. The people of the Valleys developed a distinctive culture, incorporating chapels, choirs, rugby clubs, trades unions, and strong traditions of self-education and political activity.

There are remains of blast furnaces built in the late eighteenth century or the early nineteenth century at several sites in South Wales including those at Cyfarthfa (Merthyr), Clydach, Aberdare, Neath Abbey and Hirwaun. At none of these sites are the remains of the ironworks as complete as at Blaenavon, and none of them is so actively conserved and interpreted. There are four museums of coal mining in the Valleys, but only at Big Pit is it possible for visitors to enter historic underground workings, and only at Big Pit are the surface structures of a mine conserved in their entirety. Limestone quarries and evidence of iron ore extraction by scouring and patching can be observed at several places at the heads of the Valleys, but none provides the quality of evidence which can be observed at Blaenavon. Similarly there are remains of primitive railways throughout the region, but nowhere is it possible to see such a complete or so dramatic a system as Hill's Tramroad. Few settlements in South Wales provide as much tangible evidence of the culture and social life of the region as the town of Blaenavon. Within its region Blaenavon retains the most complete range of physical evidence of the social and economic structures created by large-scale industrialisation, and provides an unparalleled opportunity to understand the historical and geographical inter-relationship of all its features.

*Hill's Tramroad drawing by
Michael Blackmore, published
in 'Portraits of the Past'*

©Blorenge Books



Nomination Document

The reasons for the primacy of Blaenavon within its region may be summarised thus:

- the archaeological quality of the Ironworks and its historical importance, its links with the development of the Gilchrist Thomas process for making steel, its statutory protection, the active conservation and interpretive policies pursued at the site;
- the exceptionally complete range of structures remaining at Big Pit, the access to underground workings, the statutory protection of the site, the active management policies pursued by the Museum Trust and the National Museums and Galleries of Wales;
- the extensive evidence of the sources of coal, iron ore and limestone, with due statutory protection of the most important sites, and active programmes of interpretation, through literature and guided walks;
- evidence of the transport systems of the first 60 years of the ironworks, which are themselves important evidence of the evolution of transport history, and which are duly protected by listing and scheduling, accessible by designated public footpaths, and interpreted through literature and published walks;
- evidence of the management of water resources for application in prospecting for and extracting minerals, and in power and transport systems;
- evidence of vertical integration of the forging side of the iron industry, and the legislative protection accorded to the key site at Garn-ddyrys, which is a Scheduled Ancient Monument;
- the surviving dwellings of ironworkers and coal miners, the most important examples of which are accorded legislative protection through Listing, Scheduling and Conservation Area status;
- the town of Blaenavon, illustrating the social and cultural context of ironmaking and coalmining, which has also been accorded extensive legislative protection;
- the integrated system of management, through partnership between many organisations which have interests in the area.

Elsewhere in Britain the Ironbridge Gorge, already a World Heritage Site, is a coalfield landscape which developed gradually from the sixteenth century, reached a peak of activity between 1750 and 1800 when it was the scene of many innovations and much scientific excitement, and then settled into a period of decline. Blaenavon grew rapidly, making use on a new and comprehensive scale of the latest industrial technology. In many respects its experiences were more representative of industrial developments generally. It illustrates the consequences of the application of the forms of technology and organisation developed at Ironbridge and elsewhere during the Industrial Revolution, and its designation would be a logical complement to the designation of the Ironbridge Gorge.

Other surviving blast furnaces of the Industrial Revolution period in England, Scotland and other parts of Wales are isolated. Several furnaces remain in Shropshire, several in the Sheffield area, at Moira in Leicestershire, at Duddon and Backbarrow in Cumbria, at Bonawe in Argyll and at Dyfi Furnace on the mid-Wales coast. None stands within a historical landscape comparable with that of Blaenavon.

Big Pit is one of three national museums of coalmining in the United Kingdom, the others being Caphouse Colliery in Yorkshire, and Lady Victoria Colliery at Newtongrange, near Edinburgh, Scotland. The three are

Blaenavon Industrial Landscape



*Big Pit Mining Museum,
pit head winding gear*
©Crown Copyright: RCAHMMW

essentially complementary. Lady Victoria is a very large colliery of the closing years of the nineteenth century, adjacent to an extensive, purpose-built village where its miners were accommodated. There is no underground access. Caphouse is comparable in size and date with Big Pit, but reflects the distinctive traditions of the Yorkshire coalfield. Access to underground workings is currently suspended but funding has been made available for its restoration. The other principal monuments of coalmining in the United Kingdom comprise isolated structures such as headstocks, pithead baths, and engine houses, which have been accorded statutory protection and are interpreted; and parts of the Black Country, Blists Hill and Beamish open air museums, in which in situ features are combined with exhibits moved from elsewhere. Big Pit is typical of many collieries, in that it was, in spite of its name, relatively small. Its surface installations, always modest in scale and undemonstrative in style, were built and rebuilt over the whole 120-year life of the mine as was the case at most collieries. It is one of the key elements in the industrial landscape of Blaenavon, and also one of the essential features in the interpretation of the history of coalmining in the United Kingdom.

The various forms of statutory protection accorded to the industrial landscape of Blaenavon represent substantial changes in attitudes to the conservation of industrial monuments in the United Kingdom during the past 40 years. The area suffered severely from poverty, unemployment and lack of both private and public investment in the 1920s and 1930s. Planners in the 1940s expected that Blaenavon and similar isolated mining communities in South Wales, and in west Durham and other coalfields, would be evacuated. A forecast in 1943 anticipated that ‘the rather bleak area of Blaenavon... should gradually be liquidated’. The inhabitants of one particularly isolated group of cottages were indeed moved to Llanfoist, at the foot of the Bloreng, and the houses demolished. However the strength and persistence of local people as well as changing attitudes to planning have now ensured the survival of Blaenavon. At the same time, new attitudes to historic industrial landscapes have led to the protection and interpretation of Blaenavon’s monuments, and have drawn in increasing numbers of visitors from other parts of the United Kingdom and from overseas.

Comparative Analysis: International Context

There are currently less than twenty industrial sites on the World Heritage List. Potosi in Bolivia, Guanajuata in Mexico, Rammelsberg (Goslar) in Germany, Banská Stiavnica in the Slovak Republic, Røros in Norway and Falun in Sweden relate to non-ferrous metal mining; Wieliczka in Poland and Arc-et-Senans in France to saltworking; Crespi d’Adda in northern Italy to textiles and hydro-electric power, and Verla in Finland to timber processing. The Canal du Midi in France and the Germany quays at Bergen in Norway can also be regarded as industrial monuments. Only the Ironbridge Gorge in the United Kingdom, Engelsberg in Sweden and Völklingen in Germany relate to ironmaking.

The Ironbridge Gorge, as argued above, represents a different kind of industrial landscape from Blaenavon. Both were concerned with coal-mining and ironmaking, but the settlements in the Ironbridge Gorge grew gradually over more than two centuries, whereas industry came suddenly to Blaenavon. The Ironbridge Gorge’s technological pre-eminence in the late eighteenth century was marked by the construction of the Iron Bridge, opened on New Year’s Day 1781. This was just seven years before Thomas Hill, Thomas Hopkins and Benjamin Pratt began to build Blaenavon Ironworks to apply the new methods of the Industrial Revolution in a fresh and geographically rich environment.

Engelsberg is the most perfectly preserved example of the traditional Swedish bruk of the seventeenth and eighteenth centuries, a settlement devoted to the smelting of iron ore and the forging of pig iron into wrought iron. Charcoal was used as fuel in both processes, and the local forest economy was geared to the supply of wood which could be burned to make charcoal. The settlement at Engelsberg includes a blast furnace, a forge, workers’ housing and the owner’s mansion. It is an amazingly complete and quite beautiful landscape, but one from a wholly different period and culture to that of Blaenavon.

Völklingen in the Saarland is a huge and largely complete blast furnace complex, the earliest parts of which date from the late nineteenth century. It represents the vastly larger scale of operation which came to characterise twentieth century iron and steelworks.

Blaenavon is essentially complementary to the Ironbridge Gorge, Engelsberg and Völklingen. While the four sites are all concerned with ironworking, they represent different chronological periods, different forms of technology, and distinctive cultural traditions. Of its type and period, the Blaenavon Industrial Landscape provides the most instructive and best preserved remains in the world.

Blaenavon has many international links. Many Irish migrants were employed at its mines and ironworks in the 1840s, 1850s and 1860s. Workers came from as far as northern Italy. At times of economic depression in the 1820s and 1840s many skilled workers from Blaenavon sought their fortunes in the United States, some of

Blaenavon Industrial Landscape

them taking valuable skills to American ironmasters. In one week in 1848 no less than fifty people left Blaenavon for the United States. In the 1850s Australia came to rival America as a destination for migrants.

From the 1860s rails from Blaenavon were being supplied to railway companies in Russia, Finland, India and Canada. In about 1860 the Blaenavon Company negotiated with the French firm of Petin, Gudet et Cie to use their patent process in a mill to roll



Blaenavon's links to the world

iron for weldless tyres. In the 1880s, as local supplies of iron ore were becoming exhausted, the Blaenavon Company began to import Spanish ore which was shipped from Bilbao, and carried up the valley by rail from Newport docks. The most significant international connections of this period came through the transfer of the steelmaking process developed at Blaenavon by Percy Gilchrist and Sidney Gilchrist Thomas, which was publicly announced in London in March 1878. Within four years it was being used at works in France, Belgium, Germany, the Habsburg Empire and Russia, and the American steel magnate Andrew Carnegie paid 250,000 dollars for the right to use the process in the United States.

Some Blaenavon people worked in Russia in the late nineteenth century and the early twentieth century. Thomas Caddick, son of a blacksmith, was married at Odessa in 1886 to a bride whose father was a puddler from Blaenavon, and spent 28 years working in

Original Marriage Certificate of Thomas Caddick and Mary Ann Taylor, Taganrog, Odessa, 1886

©D G Caddick

When Thomas Caddick returned to Blaenavon in 1891, he invented the 'dognail' which was used universally on the railways. He became known as 'Dognail Caddick' and his employers rewarded him with a guarantee of employment for as long as he could walk to work. He held a responsible position at Big Pit until the age of 82.



Nomination Document

Russia, before returning to Blaenavon, where he worked at Big Pit, and coached local rugby teams. He and his wife's kinsmen worked for the New Russia Ironworks, established in the Donetsk basin in 1869 by the Welshman John Hughes. The town around his Russian works came to be known as Hughesovska, but its name was changed to Stalino in 1924, and subsequently to Donetsk. International connections have continued in the twentieth century. Belgian refugees worked in shell factories at Blaenavon during World War One, and the Canadian Army provided expertise for the development of open cast mining during World War Two, part of a programme which contributed significantly to the British war effort.



*Colliery and coke ovens,
Hughesovka Works,
near Odessa, 1919
©NMGW*

Given the importance of British technological and organisational development during the Industrial Revolution and its place in the international transfer of technology, the significance of Blaenavon extends far beyond the bounds of the South Wales Valleys, of Wales or of the United Kingdom.

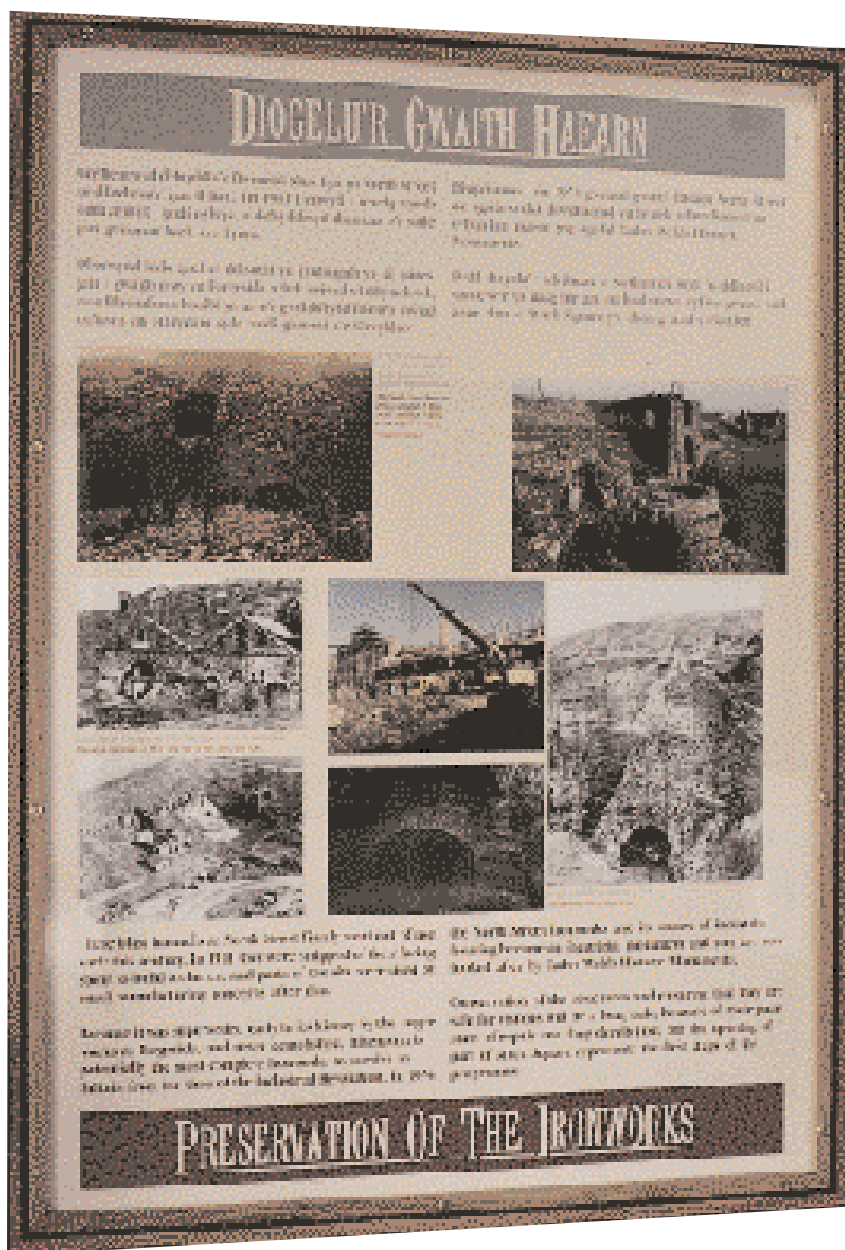


*Henry Taylor (left) with
group of workers at
Hughesovka c1895
©NMGW*

2(c) Authenticity and Integrity

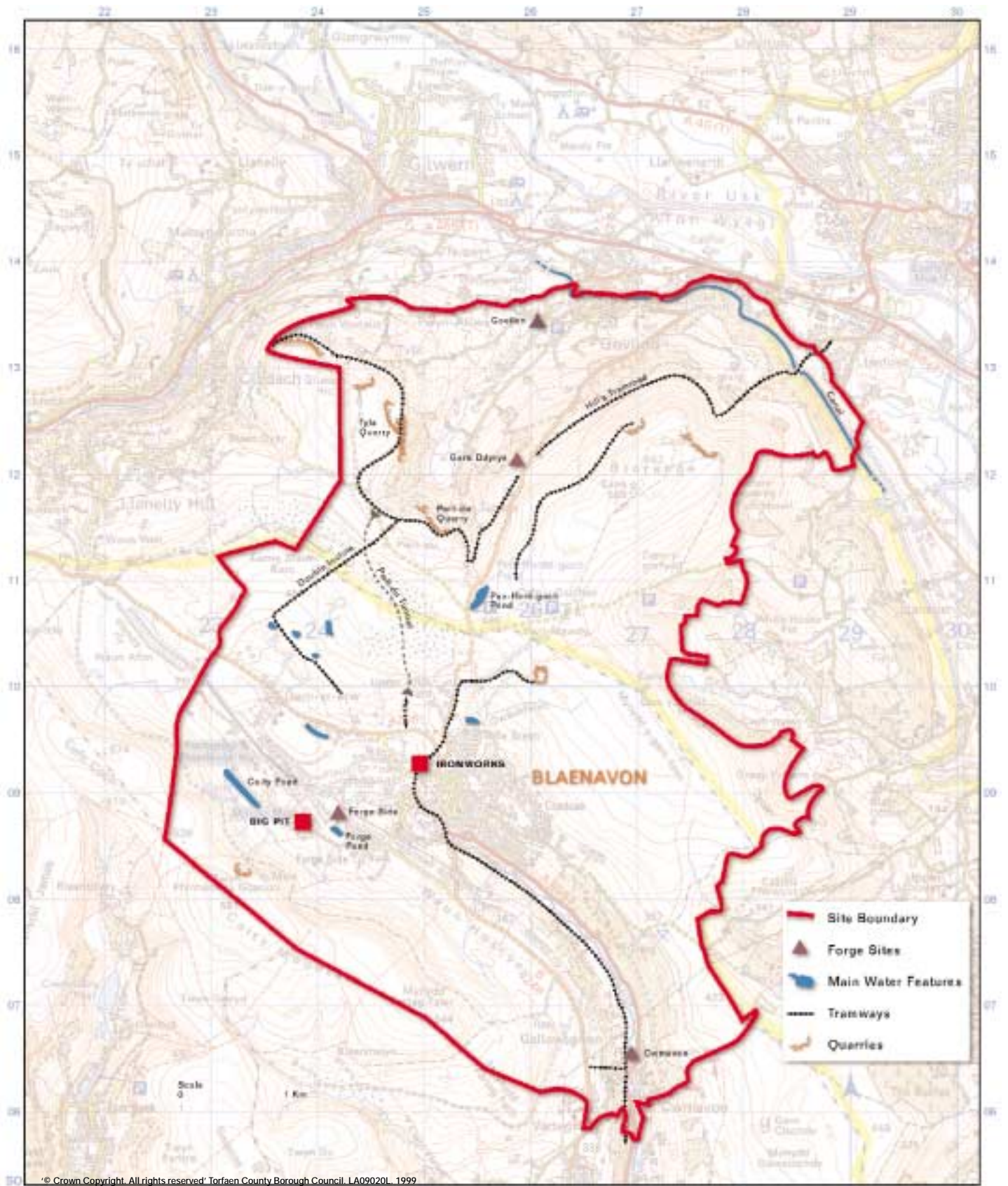
Blaenavon fulfils all the criteria for authenticity in relation to World Heritage Sites set out in the declaration of the conference organised by UNESCO, ICCROM and ICOMOS at Nara, Japan, in 1994. Its landscape represents powerfully a particular stage of human development, the large scale industrialisation of the late eighteenth century and the early nineteenth century, the human achievements and sufferings of that period, and the cultural values which were developed as communities evolved. The paper on ‘Authenticity in the Industrial Heritage’ at the Nara Conference argues that the essence of the industrial landscape is the co-existence within it of heroic and mundane structures, which is precisely what can be observed at Blaenavon.

Blaenavon Ironworks, interpretative panel explaining conservation work
©Cadw



The Blaenavon Industrial Landscape is a relict landscape in which exceptional evidence of past activities survives. All of the key components within the landscape benefit from statutory protection as Scheduled Ancient Monuments, Listed Buildings or Conservation Areas, and the whole of the area is protected by specific planning policies. Nearly half the site lies within the Brecon Beacons National Park. The two most important individual assets, Blaenavon Ironworks and Big Pit, have been actively conserved for more than two decades. Value has been placed on authenticity, and best practices of conservation have been followed. No reconstruction has been carried out except where necessary for the structural integrity of monuments and where appropriate conservation standards can be applied. None of the important features of the Blaenavon Industrial Landscape are replicas. As a living landscape, some areas have experienced new development and some buildings have been adapted for continued use. Thorough documentation of the features within the landscape, by aerial mapping, measured survey, photogrammetry, and written records, enables the condition of all aspects of the landscape to be monitored and informs conservation strategies.

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Locations of selected features of the Blaenavon Industrial Landscape

2 (d) *Criteria under which this inscription is proposed and justification for inscription under these criteria:*

In *Operational Guidelines for the Implementation of the World Heritage Convention*, paragraph 24 states that a site which is nominated for inclusion on the World Heritage List will be considered to be of *outstanding universal value* if it meets one or more of the six criteria set out. It is considered that the Blaenavon Industrial Landscape satisfies four of the criteria :-

Criterion (ii): The site should exhibit an important interchange of human values, over a span of time or within a cultural area of the world on developments in architecture or technology, monumental arts, town planning or landscape design.

The pattern of community at Blaenavon provides valuable evidence of the beginnings of a kind of human experience which can be seen in industrial regions in all five continents. The technology of the multi-furnace coke-fuelled ironworks, of steam-powered blowing engines, deep mines, and primitive railways, were among many developments put into practice at Blaenavon which became characteristic of the Industrial Revolution and were exchanged with regions in many parts of the world. Blaenavon was associated with the discovery in the 1870s by Percy Gilchrist and Sidney Gilchrist Thomas of the means of making mild steel from pig iron smelted from phosphoric ores, a technique subsequently adopted in many countries. The rapid growth of population at Blaenavon produced new settlement and land use patterns which contrasted sharply with the existing rural settlement structure and were characteristic of rapidly industrialised communities in many countries.

Criterion (iii): The site should bear a unique or at least exceptional testimony to a cultural tradition or to a civilisation which is living or which has disappeared.

Blaenavon is a monument to the working class culture which emerged from the Industrial Revolution in the South Wales valleys, and flourished in the later decades of the nineteenth century and early twentieth century. It has many points of contact with the culture of such industrial areas as the Ruhrgebiet, the coal fields of northern France or the cities of northern Italy, and mining and metalworking settlements throughout the world. The tensions between employer and employee, the Established Church and Dissent, the Welsh speaker and English speaker, can be observed in many features of the site. The wide extent and unusually complete survival of the landscape of work and society created at Blaenavon provide an exceptional testimony to early industrialised culture.

Criterion (iv): The site should be an outstanding example of a type of building or architectural or technological ensemble or landscape which illustrates a significant stage(s) in human history.

Blaenavon illustrates with clarity the early formative stages of the Industrial Revolution with respect to the crucial developments which took place in ironmaking and coal mining in the late eighteenth and early nineteenth centuries. The value of technological monuments, like the blast furnaces, the lift tower and the coal mine (Big Pit) is vastly enhanced by the survival in the surrounding landscape of evidence of the exploitation of resources and the creation of an infrastructure for industrialisation which included transport systems, mineral extraction, and developing industrial and urban communities. All of the crucial elements of the Industrial Revolution can be observed, including continuing technological advance, the conversion from organic to mineral materials, sustained growth in output, increasing capitalisation of production, regional specialisation, urbanisation and changing social relations.

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Criterion (v): The site should be an outstanding example of a traditional human settlement or land use which is representative of a culture (or cultures) especially when it has become vulnerable under the impact of irreversible change.

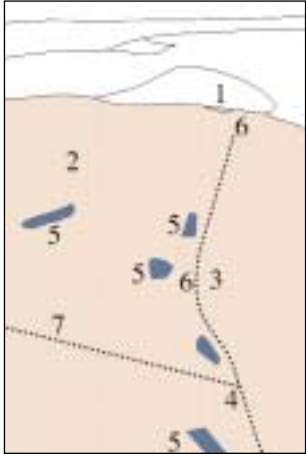
The Blaenavon landscape was the product of the human creativity of many individuals, entrepreneurs, technologists, engineers and workers, over several generations. It is an outstanding example of characteristic forms of human settlement and the exploitation of mineral and energy resources associated with the coal and iron industries in the first phases of the Industrial Revolution. With de-industrialisation and new patterns of development, land use, and living standards in the twentieth century, similar landscapes elsewhere have proved both fragile and vulnerable to the pressures of land reclamation, redevelopment and decay. The high degree of survival of land use and settlement patterns at Blaenavon is now complemented by appropriate means taken to afford their protection and conservation for the future.

Blaenavon as a cultural landscape

The *Operational Guidelines for the Implementation of the World Heritage Convention* set out guidelines in paragraph 35 in respect of cultural landscapes. Blaenavon conforms to criteria laid down by UNESCO and ICOMOS for cultural landscapes. The Ironworks, in their bleak mountain setting, and their associated transport systems and settlements, certainly represent a *combined work of nature and man*. The development of the landscape historically was specifically in response to the geological conditions and resources available and the constraints of the isolated upland environment. The patterns of exploitation still visible provide exceptional evidence of *the evolution of human society and settlement over time, under the influence of the physical constraints and /or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal*. The landscape of Blaenavon falls into category (ii) of cultural landscapes: *organically evolved landscape* which result from an *initial social and economic imperative and have developed their present form by association with and in response to the natural environment*. It combines elements of both a *relict or fossil* landscape in which the evolutionary process of industrialisation came to an end leaving significant distinguishing features visible in material form, and a *continuing landscape* with significant evidence of its evolution over time.



*View across Cwm Llanwenarth towards Gilwern Hill
Drawing by Michael Blackmore, published in 'Portraits of the Past'
©Blorange Books*

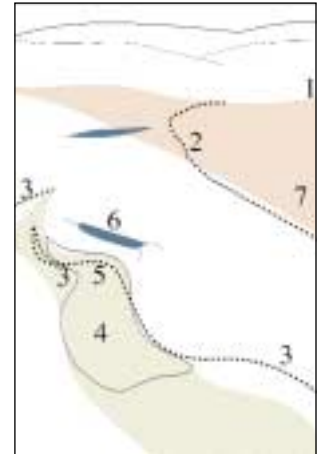


Hill's Pits

The mountain north of Blaenavon Ironworks (1) is dense with man-made features from mineral exploration. Scours and adit mines are visible to the east (2). Shaft mines sunk in the western area include Hill's Pits of 1844 (3), Balance Pit and New Pit (4) with their larger tips, associated settlement remains, and reservoirs for steam engines and water balances. Ponds and contour watercourses can be seen throughout the landscape (5). The primitive railway from Hill's Pits (6) and the counterbalanced incline built c1850 to improve the Company's connection across the mountain are clearly visible (7).

The area shaded brown indicates the extent of the Coal Measures.

*View from west, looking towards Blaenavon
©Crown Copyright: RCAHMW*

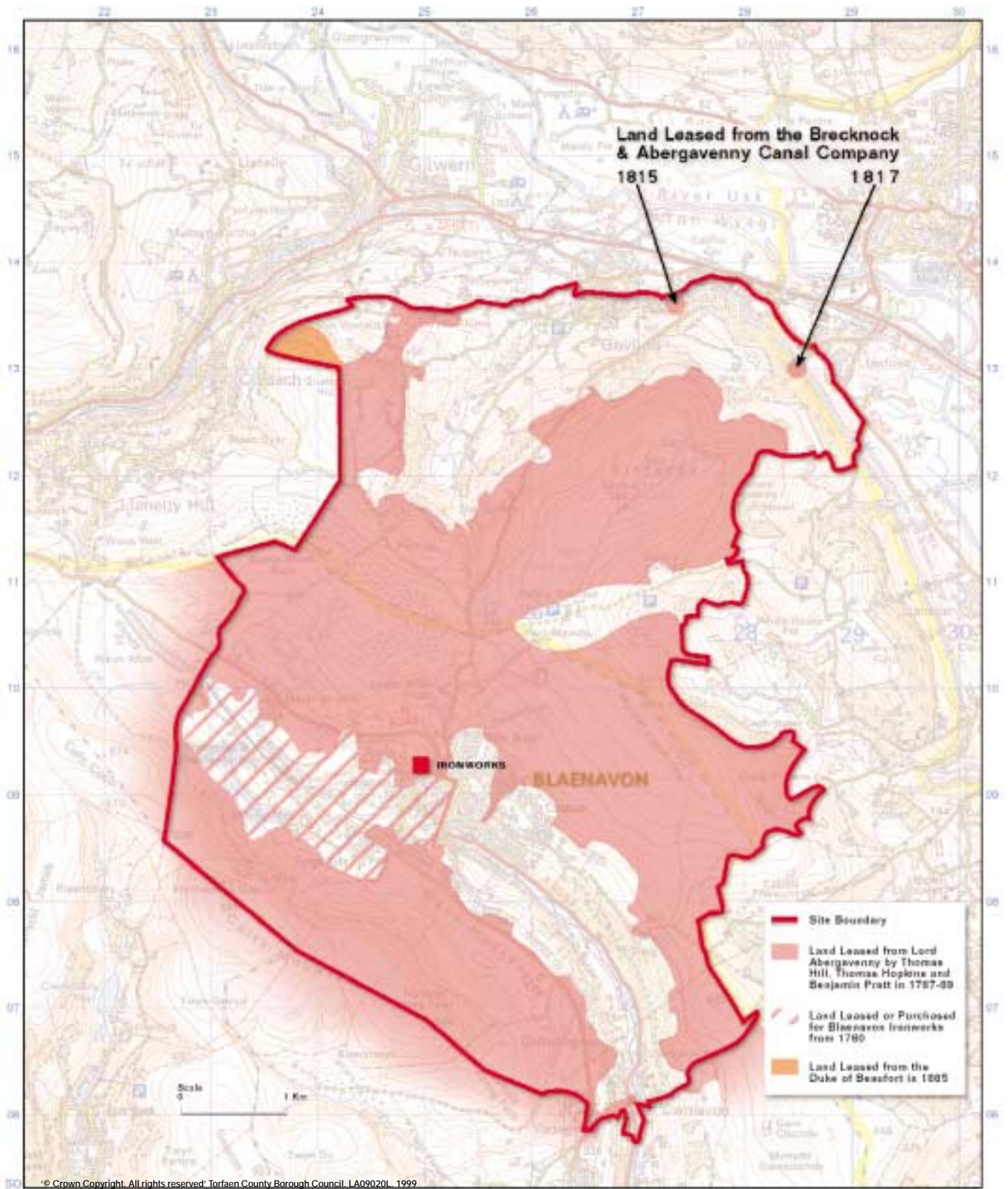


Cwm Llanwenarth

Limestone for Blaenavon Ironworks (1) was obtained from a series of quarries in the narrow Carboniferous Limestone outcrop (shaded green) north of the Coal Measures (shaded brown). Limestone was first carried across the mountain (2), but by 1817 Hill's Tramroad (3) gave access through Pwll-Du tunnel. One of the principal sources of limestone was Pwll-Du quarry (4) which survives with its associated tips, the tramroad around its head and the water balance lift (5), which was supplied from reservoirs and watercourses above (6). Iron ore and coal scourings are also visible (7).

*View from north west, looking towards Blaenavon
©Crown Copyright: RCAHMW*

Blaenavon Industrial Landscape



Plan showing nominated site boundary in relation to land holding of the Blaenavon Company.
The Ironworks is the focus of the Blaenavon Industrial Landscape

3 DESCRIPTION

3(a) Description of Property - The Cultural Resource

The Blaenavon Industrial Landscape, which is located at the head of the Avon Llwyd and also on the southern flank of the Usk Valley, lies at an altitude of between 70 m and 581 m above sea level. The site is about 24km from the sea at Newport, which is visible in fine weather from several parts of the nominated area, and about 40km from Cardiff, the Welsh capital. Blaenavon is at the north-eastern corner of the South Wales Valleys, at a point of abrupt landscape change. The traveller approaching Blaenavon from the east passes from the patchwork of fields and farmsteads which comprise lowland Monmouthshire to a dramatic landscape shaped by ironworking and coalmining. Memories of the journey from rural mid-Wales to the industrial Valleys remain in the collective memories of families whose ancestors migrated southwards in search of employment in the nineteenth century. 'There was smoke for miles' was a phrase repeated from generation to generation of one family. The Blaenavon area was only sparsely settled before the 1780s, although some minerals were worked on a modest scale by the Hanbury family of nearby Pontypool in the seventeenth century and the eighteenth century. The structures, sites and landscapes which justify the importance accorded to the area all date from the period after land was leased for a wholly new scale of industrial development between 1787 and 1789.

3(a)i Blaenavon Ironworks

The Ironworks is the focus of the industrial landscape of Blaenavon and the *raison d'être* of the mineral workings and settlement.

In 1787-89 an extensive area of land for an ironworks, with all its necessary sources of raw materials, was leased from Lord Abergavenny by Thomas Hill, Thomas Hopkins and Benjamin Pratt, the first partners in the Blaenavon Company. The partners proceeded to construct three blast furnaces, with casting sheds and a blowing engine built by Boulton and Watt. They followed the most up-to-date practice of the time, in that they used steam power rather than water power to operate the furnace bellows. The first works in the world to do this, at Snedshill in Shropshire, had been built only a decade previously. The partners were confident enough of the new technology to locate in a mineral rich hillside site where only steam power could practically be used. They also had sufficient confidence in their ability to provide coke, iron ore and limestone to construct three furnaces at one works. Few contemporary works had as many, and these had grown from an initial single furnace. By 1796 the works was producing 5,400 tons of iron a year making it already one of the largest in the world. By 1812 there were five furnaces capable of smelting 14,000 tons of iron a year.

The establishment of Blaenavon Ironworks represented the comprehensive application of several generations of developments in the British iron industry. Hill, Hopkins and Pratt came from the English Midlands, where techniques of working iron with coal rather than charcoal had been introduced during the eighteenth century. In order for the new methods of the Industrial Revolution to be applied to their true revolutionary effect they required a new location rich in all the sources of raw materials. The realisation of this potential by ironmasters, at Blaenavon and elsewhere in South Wales, was crucial to the achievement of the phenomenal growth in output of iron which took place in the following years.

In 1709 the first Abraham Darby had successfully smelted iron ore with coke made from mineral coal. In the 1750s his son, also Abraham Darby, developed means of smelting with coke which produced pig iron suitable

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for forging into wrought iron, and established a pattern of vertical integration in the industry. This involved forges as well as furnaces, mining and quarrying, the sale of lime and domestic coal, brickmaking, mechanical engineering and even farming. In 1776 John Wilkinson used a steam engine directly to power a blast furnace, thus enabling furnaces to be built away from sources of water power. Richard Wright and Richard Jesson in 1772, and Henry Cort in 1784, demonstrated that coal could be used in forging wrought iron from pig iron. By a process of symbiosis the technology of mining was developed alongside that of ironmaking. Steam engines, whose essential parts were made at ironworks, were applied to drain mines of water, and to operate winding mechanisms by which minerals were raised from, and miners given access to, underground workings. This range of technology, and these distinctive patterns of company operation were brought by Hill, Hopkins and Pratt to the head of the valley of the Afon Lwyd.

In about 1810 two more furnaces were added, with a second engine house. The first five furnaces were constructed of stone and brick, on a square plan. One was converted to hot blast operation about 1852.

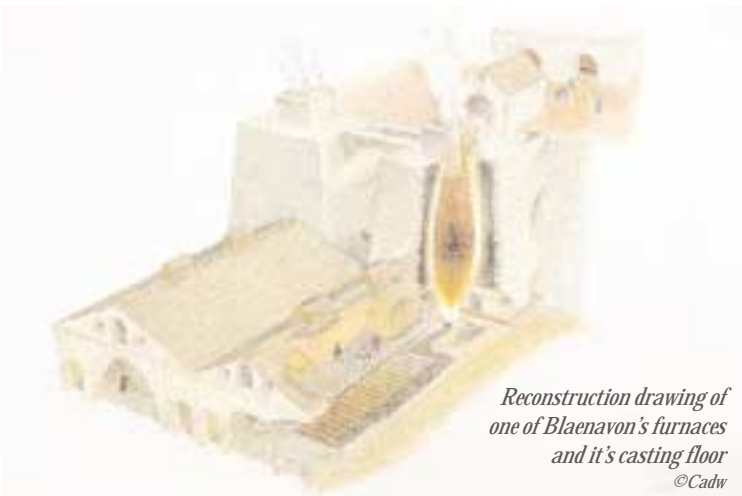
A sixth furnace was built in 1860 following the characteristic form of that time with a masonry base, above which was a circular structure of firebrick.

All the furnaces were built against a high stone-walled bank cut out of the hillside in the characteristic manner of South Wales. No 2 furnace, which is one of the original structures

dating from 1789, is largely intact. It was kept in operation until 1902 making high grade cold blast iron.

Furnaces 4 and 5, added in 1810, are substantially intact. The lower section of furnace 6, the circular furnace of 1860, represents a very rare survival of this evolutionary form of furnace. Furnace 4 and 5 were altered in 1881 to cast ingots which were used in steelmaking at the Company's Forgeside Works. The rail tracks leading to the furnaces remain in situ, and ingot moulds found during excavations are displayed nearby.

The furnaces, in their completeness and diversity of form, provide a better impression of eighteenth century and nineteenth century ironmaking technology and its development than any other group in Britain. At the top of furnace 5 remains the 'throat-armouring', strips of iron which directed material tipped into the furnace towards its centre, thus protecting the firebrick lining. The removal of exterior cladding from some of the furnaces makes it possible to understand their complex structures. The ashlar gritstone of the outwork of the furnaces is of high quality. Around the furnace hearth, stone and firebrick has been reddened by fire. The cast house of furnace 2 is intact, demonstrating the characteristic arched form of such structures, to provide shelter yet permit ventilation. Foundations of the blowing engine house have not yet been excavated, but the base of its massive chimney from which Stack Square takes its name, is clearly visible, as are the cast iron pillars and brackets which carried blast pipes to the furnaces. In furnace 5 there are still water-cooled tuyères through which air passed to its fiery interior. The output of blast furnaces was substantially increased from 1828 by heating the air charged from their bellows, the hot blast process invented in Scotland by James Neilson and adopted at Blaenavon Ironworks in the 1850s. The base of the firebrick structure of a hot blast stove in the western corner of the site can be seen, and there are many examples of the honeycomb firebricks used inside such stoves. The retaining wall behind the furnace is riddled with large ducts for hot blast air to be carried around the site.



*Reconstruction drawing of
one of Blaenavon's furnaces
and its casting floor
©Cadw*

Blaenavon Industrial Landscape

The Blaenavon Company was reorganised as a joint stock company in 1836, when James Ashwell was appointed managing director. He came from Nottinghamshire, had been a pupil of the great engineer, Bryan Donkin, and had directed ironworks in Derbyshire and Scotland. Ashwell was responsible for an extensive programme of improvements to the company's furnaces and forges, to its transport systems and to the houses provided for its workpeople.



The most impressive monument to Ashwell's work at Blaenavon Ironworks is the water balance tower at its northern end, which was built in 1839. This form of lift technology using water to counter-balance loads was used in the mine shafts of south east Wales and at several ironworks. This site is the best preserved example. The lift tower was linked to high ground behind by a wooden bridge, which was quickly replaced by the stone bridge which remains. Its winding gear consisted of a cast iron frame with Classical detailing, on which was mounted a pulley wheel over which a chain linked a pair of lift cages, each incorporating a wrought iron water tank. By piping water in or out of the tank, wagons could be lifted or lowered as required. The stonework of the tower is of high quality, and it is topped by the remnants of the cast iron frame, which has the appearance of a ruined Classical temple. One of the lift cages and water tanks is conserved on the site. Evidence that the system could accommodate wagons of two different gauges, and some dual gauge cast iron track, survives at the foot of the lift. The lift had probably passed out of use by 1879. An adjacent building which runs into the bank was used at one stage in its history for storing chains for the lift but is believed originally to have been a pair of coke ovens.

James Ashwell's water balance tower; a hydraulic lift built in 1839
©Cadw

A large building, well-ventilated by open arches, was constructed on the site of the original Boulton & Watt blowing engine house, some time after 1860. This was a foundry which eventually employed 170 people. Iron was melted in the cupola furnaces, one of which remains, and moved in ladles around the buildings by means of swivelling cranes whose anchorage points can readily be identified in the walls. The remains of two core drying kilns lie next to this, in which sand mould boxes were prepared for casting objects.

Above the furnaces is a range of ruined kilns in which iron ore was calcined, or roasted, thus separating dross which contained little iron from a concentrate that was charged to the furnaces. Other buildings remaining on the site include a pay office, a storage shed and a chimney, all of which date from before 1880. The important range of workmen's homes built in 1788 and which included an office, managers house and company shop are described in section 3(a)vii.

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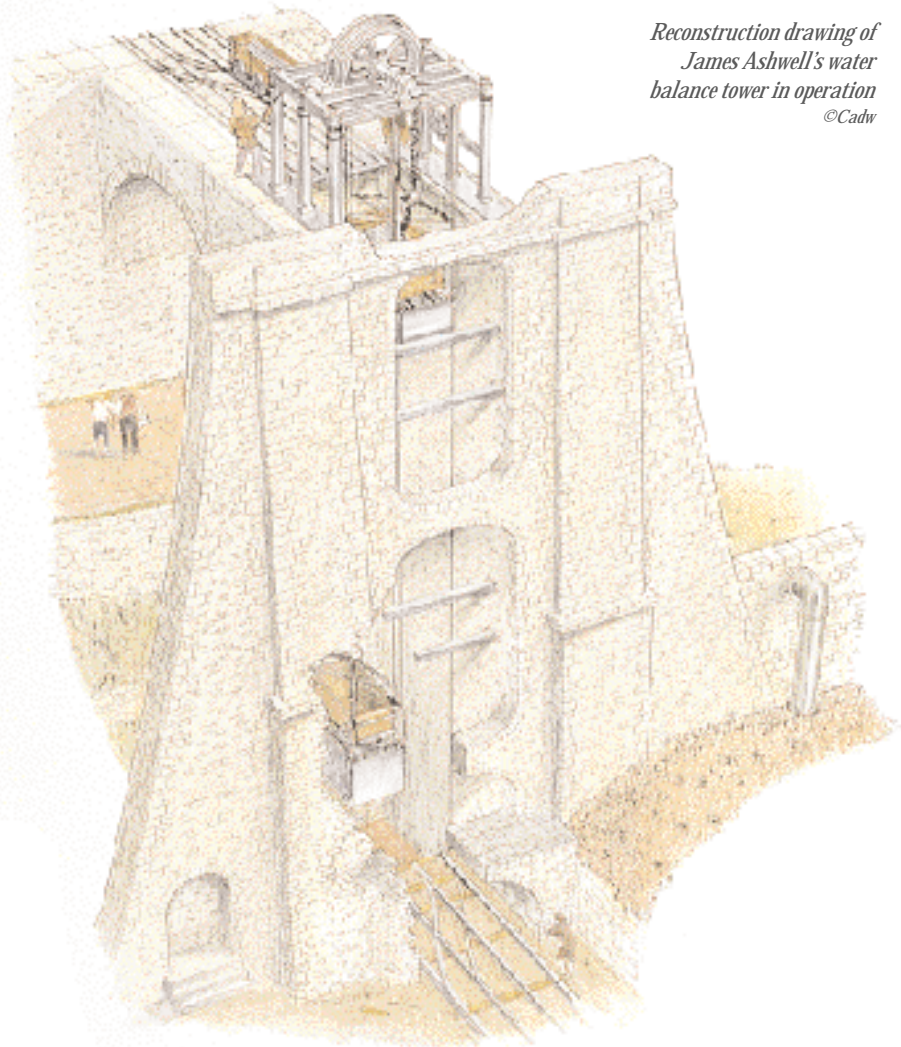
In the 1870s, experiments in ironworking technology which had world-wide repercussions took place at Blaenavon Ironworks. In 1856 Henry Bessemer had for the first time made mild steel, which combined the properties of cast iron and wrought iron, and which, unlike the latter, could be made in bulk by blowing air through a vessel containing molten iron. By chance he had used iron which was free of phosphorus, but when the process was tried using cast iron made from phosphoric ores it proved unsuccessful. In the mid-1870s the Blaenavon Ironworks chemist, Percy Gilchrist, and his cousin Sidney Gilchrist Thomas, who had studied metallurgy at the University of London but worked as a police court clerk in London, carried out experiments at their own cost at Blaenavon, developing linings for Bessemer converters that would absorb the unwanted phosphorus. Sidney Gilchrist Thomas announced the success of the experiments in London in March 1878, and in the subsequent scientific paper paid tribute to the assistance he and his cousin had received from the Blaenavon Company. By 1882 fourteen ironworks in Great Britain, France, Belgium, Germany, Russia and the Habsburg Empire had invested in converting to the Gilchrist-Thomas process. Andrew

Carnegie, the great American steelmaker

paid 250,000 dollars for the right to use the process in the United States, and remarked that: 'These two young men, Thomas and Gilchrist of Blaenavon, did more for Britain's greatness than all the Kings and Queens put together. Moses struck the rock and brought forth water. They struck the useless phosphoric ore and transformed it into steel.' A pink granite memorial with a relief bust of Gilchrist Thomas, which was originally erected at the Forgeside works, now stands adjacent to Blaenavon Ironworks, while the hearths of furnaces 4 and 5, adapted to cast ingots for steel making by the Gilchrist Thomas process, and the ingot moulds displayed nearby, are evidence of Blaenavon's most significant single contribution to metallurgical technology.



*Sidney Gilchrist Thomas
1850-1885*



*Reconstruction drawing of
James Ashwell's water
balance tower in operation
©Cadw*

3(a)ii *Big Pit*

Big Pit is a museum of coalmining of international significance. In the context of Blaenavon it provides evidence of the ways in which the coal used in smelting iron ore at the Ironworks was obtained. The supply of coal was one of the engines of the Industrial Revolution and the central element in the transfer from organic to mineral technology. Coal at Blaenavon provided fuel for roasting, smelting and forging iron, for steelmaking, for burning lime, for making bricks, for powering steam engines, and in export for fuelling locomotives and steamships. It was vital to domestic settlement in an inhospitable climate with little timber.



Aerial view of Big Pit Mining Museum. Pit head baths and canteen in the foreground
© Crown Copyright: RCAHMW

The first shaft at Big Pit was sunk in 1860 or before and was linked below ground to workings dating from the 1830s for iron ore and coal. It was one of several collieries operated by the Blaenavon Company, initially to produce coking coal for the blast furnaces, but later to extract coal for sale for other purposes. Big Pit was the last deep mine to work in the Blaenavon area, and the surface buildings remain almost exactly as they were when coal production ceased in 1980. They date from between the late nineteenth century and c1970 and are characteristic of the surface structures of a modest-sized South Wales colliery. They are without architectural pretension, and are exceptional in their completeness.

The winding engine house was built in 1952 as part of improvements following nationalisation of the British coal industry, when an electric winder supplied by The Uskside Engine Company from nearby Newport was installed. The stone base of a nineteenth century winding house remains visible. The present steel headgear dates from 1921 and was used until 1973 for winding coal and until 1976 for men and materials. The system by which wagons carrying coal from the underground workings were unloaded from the cages in the shaft and discharged their coal remains intact. Other surface buildings include a fan house, a compressor house, a haulage engine house which provided power for moving wagons in a drift mine, a welding and fitting shop, a smithy, a stable block, an electricians' workshop, a sawmill for pit props, the offices of the manager and under-manager and an isolated powder

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house. On the hillside above the main mass of the buildings are the miners' baths and canteen, opened in 1939. Like almost all such buildings at British collieries, they are built in the International Modernist style derived from precedents in the Low Countries which was favoured by the architects of the Miners' Welfare Committee from 1924 onwards. It is the only pre-War baths building in Wales which retains its hot air lockers for drying clothes, its shower cubicles, its automated boot brushes, canteen and medical room. It is regarded as one of the best examples anywhere of this important building type.

Big Pit is one of only two mining museums in the United Kingdom where visitors can be taken underground. After depositing contraband, tobacco, matches, and any electronic devices, visitors are taken in the cage down the shaft of

1860 to a range of workings, some dating from the 1830s. It is possible to see the ventilation system used in the mine, and the kinds of ventilation door worked by children of less than ten years of age until their employment was made illegal in 1842. A large twentieth century haulage engine used for drawing wagons along the roadways, the system of communication from workings to pit bottom by means of wires, the substantial outflow of water from the mine, the nineteenth century stables for the ponies which once worked underground, and evidence of the methods of extraction used in the last years of the mine's operation can also be seen.

Access is also possible for specialists to River Level, which affords emergency access to the mine from near the Afon Lwyd river, an underground steam engine house of the early nineteenth century, and other workings.

This is an exceptionally complete colliery site. It lacks the scale of a very large pit like Lady Victoria at Newtongrange, and the architectural flamboyance of such mines as Zollern XII in Essen, but its compact size combines with its completeness and representativeness to make it one of the best places in the world to gain an understanding of historic mining processes and of the human experience of coalmining.

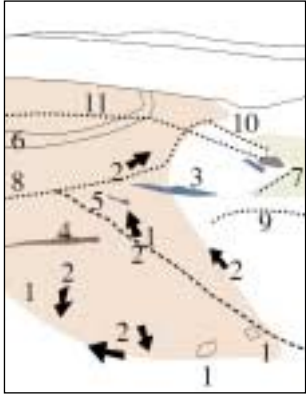
Layout of underground workings, Big Pit Mining Museum



Miner cutting coal by candlelight

*Engine Pit Level of 1810 still survives below Big Pit. The coal was turned into coke as one of the essential raw materials in the ironmaking process
©Crown Copyright: RCAHMW*





Pen-fford-goch

Blaenavon lies at the north eastern outcrop of the South Wales Coalfield (shaded brown). Scouring with water from temporary ponds and watercourses (1) took place from the seventeenth century. Datable scouring features are well preserved (2). Those on the north had ceased by 1817 when the reservoir for Garn-Ddyrys Forge was built (3). Adit mines were driven into the outcrop before 1812 and their approaches and tips can be seen, together with a collapsed example (4). Primitive bell pits (5), and opencast operations for World War Two (6) are intact. Above Pwll-Du quarry (7) can be seen the limestone road across the mountain (8), a tramroad of 1796 (9), Hill's Tramroad (10) and the Dyne Steel incline across the mountain (11).

The Carboniferous Limestone outcrop is shaded green.



*View from south east, towards the Brecon Beacons
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3(a)iii Sources of Coal, Iron Ore and Limestone: the Landscape North of the Ironworks

The landscapes to the north of Blaenavon Ironworks comprise one of the area's most precious historical monuments. It is possible within this area to gain an understanding of the ways in which all the raw materials necessary for making iron were obtained - coal, iron ore, fireclay and limestone. The areas around Garn-yr-erw, Pwll-Du and Pen-ffordd-goch appear at first sight to be wholly disordered, to be nothing more than random dumps of spoil. However, closer examination reveals evidence of the earliest periods of mining and quarrying in the area, phased relationships, and patterns of mineral extraction over several generations. Coal, fireclay and iron ore nodules were found together in the coal measures of the Afon Lwyd valley and the mountain top. Limestone was brought from the escarpment on the north side of Pwll-Du and the Bloreng.

One of the best preserved areas of coal measure workings, at Pen-fford-goch, is a Scheduled Ancient Monument of 40 hectares in extent. There is much evidence of hushing or scouring, the process of impounding water with dams and then releasing it to expose veins by removing overburden, or to wash piles of ore extracted from adits. This was probably carried out before the seventeenth century and expanded in the first two decades of the Blaenavon Ironworks. However, it is known that scouring ceased by 1817 when the nearby reservoir was built, thereby securely dating the surviving features to before that time. One particular scour that has been recorded follows the southern outcrop of the coal measures south east from the Llanellen road through Cefn-y-lan to the Abergavenny Road. There are the remains of ponds at its head, and throughout its length it was fed with water from adit mines. It was probably used over a long period for washing ore from levels. Map evidence from about 1812 shows numerous adits, or horizontal mines going into the hillsides in this area, many of them named after individual miners. This individualism is characteristic of the development of coal and iron mining throughout South Wales. To the south of Pen-ffordd-goch are numerous bell pits, examples of the most primitive form of shaft mine, of which the surviving evidence is usually a saucer-shaped depression, indicating the site of the shaft, surrounded by the spoil which was dumped around it. The remnants of hushing ponds, leats which supplied them with water, crowsfoot-shaped tips of waste materials, the collapsed entrances to adits, the abandoned earthworks of primitive railways, subsidences indicating the presence of pillar-and-stall mining systems beneath, and the site of a weighing machine can also be observed in the area.

A number of sites of coal and iron mining throughout the area show the method and condition of working at primitive open cast workings, adits and shaft mines. Surface digging of the outcrops and the use of bell pits probably continued until the 1860s when A J Munby, the commentator on *Working Women*, wrote of the 'robust and fearless girls who work at those mountain mines'. The best-documented and most easily identified of the adit mines of the early nineteenth century which took their names from the miners who worked them is Aaron Brute's level between the Furnaces and Forgeside, which is a Scheduled Ancient Monument. The entrance to the level is known to survive, and near to it stands an iron bridge dating from before 1832 which carried the primitive railway which led from the mine to the Ironworks. The significance of the many early nineteenth century bridges carrying primitive railways in South Wales was acknowledged in the TICCIH/ICOMOS study of bridges edited by the chief of the Historic American Engineering Record and published in 1996. Aaron Brute's Level was typical of many workings in Blaenavon, but rather more is known of Aaron Brute than of most miners. He was a stone mason and building contractor, and a Calvinistic Methodist preacher. He dug the level sometime between 1812 and his death in 1818, and also constructed houses along Brute's Road, on his own freehold land. The level had ceased to produce iron ore by 1843.

Remains exist of the earliest shaft mine in Blaenavon, Engine Pit of c1806, recently scheduled as an ancient monument. The substantial remains of Hill's Pits at Garn-yr-erw, sunk between 1839 and 1844 to provide both coal and iron ore for the Ironworks and operated until 1893, provide evidence of later, more advanced mining technology. The outstanding monument is the stone chimney which survives to a height of 6m and

Blaenavon Industrial Landscape

served the boilers of the winding engine. Surrounding it are the remains of the engine house and plots of land associated with the miners' cottages. The Hill's Pits complex also includes the cast iron frame of the brake engine of a primitive railway incline, constructed at about the time the colliery came into operation, as part of a route by which coal was conveyed to the Blaenavon Ironworks. There are substantial remains of the braking gear. Inclines of this type were common in the South Wales Valleys in the nineteenth century, but this is the only example in the region which retains parts of its horizontal winding and braking mechanisms.

The area to the north of the Ironworks also provides evidence of how limestone, used as a flux in the ironmaking process, was obtained. The main quarries were at Pwll-Du at the head of Cwm Llanwenarth, and at Tyla to the west. There were also other smaller, earlier, quarries on the Blorenge. The Pwll-Du quarry was operating in roughly its present shape by 1819, and is exceptionally well-preserved. Its principal industrial monument is the shaft of a water-balance lift system, through which wagons loaded with limestone were raised to a primitive railway at a higher level. A horizontal tunnel links the shaft to the quarry floor, and evidence remains of a system of water courses and reservoirs which supplied the lifting gear with water. Limestone from the Pwll-Du quarry was supplied to limekilns along the Brecknock & Abergavenny Canal as well as to the ironworks. Cast iron boundary markers can still be seen on the quarry floor. Extraction of limestone ceased before 1860 and the form of the quarry, its railways and its tips, reflect its use in the early nineteenth century.



Pwll-Du Limestone Quarry

The Pwll-Du quarry is a Scheduled Ancient Monument. The Tyla and Blorenge quarries also have extensive and interpretable remains of quarrying from the late eighteenth to late nineteenth centuries.



Gilwern Quarry workers, 1888
copy photograph ©F Keen

The open hillsides provide much other evidence of the industrial past. There is a mid-nineteenth century rectangular powder house, where explosives for use in quarries and mines were stored. On the top of the mountain is a stone marked with a 'B' and an 'M' on the boundary between Breconshire and Monmouthshire, which was a vital marker of the limits of the Blaenavon Ironworks lease. There are also remains of brickmaking establishments on the hillside above Blaenavon, as well as countless reminders of the products of the brickmakers in the firebricks of the blast furnaces, the walls of the cottages and public buildings, and boundary walls constructed from misshapen bricks and other waste material. Brickmaking was the principal employment for young women in Blaenavon in the mid-nineteenth century.

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In parts of the landscape, particularly near Pwll-Du, the late eighteenth and early nineteenth century workings are overlain by tips of waste from surface workings for coal of the 1940s. Open cast extraction of coal using large-scale earthmoving equipment was unknown in Britain before World War Two, although it was commonplace in Germany and the United States, and similar methods were used for quarrying iron ore in many places in the English Midlands. Surface mining began in November 1941, utilising machinery from the United States and some which had been brought from Panama. An output of 1.3 million tons was achieved in 1942, which rose to a peak of 8.65 million tons in 1944. This was almost 5% of the total output of coal in Britain, and was judged to have been a 'vital part in balancing the national coal budget during the later years of the war' as it allowed rapid supply of essential steam coals compensating for the loss of production in those coal types during the 1920s and 1930s. The early development of open cast working was considerably aided by troops of the Canadian army based in Britain who provided diamond drills and the expertise needed to work them. Some of the waste deposits at Pwll-Du are significantly known as the 'Canada Tips'. The open cast operations at Blaenavon were memorably recorded in 1943 with a series of paintings and drawings by Graham Sutherland in his role as an official War Artist. The land affected by open cast mining in the 1940s was never restored, as it would have been had it been worked after World War Two, and the crude trenches and tips are themselves evidence of that particular phase in British history. These are believed to be the only early opencast workings in Britain to survive unrestored, enabling the process of overburden removal and the contrast in scale with earlier workings to be understood.



The area north of Blaenavon Ironworks comprises a landscape of unfettered exploitation, where men and women used crude hand tools to scratch from the earth the materials which were fed to the furnaces. The landscape of Blaenavon is a memorial to a particular phase of human history; and one from which there is much to be learned, especially applicable perhaps in those countries that are undergoing large-scale industrialisation. We can utilise the area to recreate the experiences of the first phases of large-scale ironmaking. We can admire the imaginative insights of the entrepreneurs at Blaenavon, and empathise with the suffering and stoicism of their employees.

*Pwll-Du opencast workings
painting by Graham
Sutherland, 1943
©NMGW*

3(a)iv Transport Systems: Canals and Primitive Railways

The improvement of transport systems was a key component of the Industrial Revolution and was vital to the success of the coal and iron industries with their bulky goods and requirement to exploit new regions. The development in particular of dense industrial canal networks and the evolution of integrated primitive railways were central to the Industrial Revolution in Britain, especially in the period from the 1780s to the 1830s.

Much evidence remains in the landscape of the transport systems by which Blaenavon Ironworks was supplied with raw materials and its products were conveyed to the coast. These superseded a series of primitive trackways whose remains can still be seen, and continued to evolve over several generations.

The prospect of a link with the port of Newport by way of the Monmouthshire Canal was doubtless one of the factors which led Hill, Hopkins and Pratt to establish the ironworks in such a location in 1789, and within a few years the canal had been built to within 6km of the works, providing cheap bulk transportation for most of the distance to the sea. Hill was a significant investor in the canal, which was completed to Pontnewynydd in the early 1790s and was linked directly to the Ironworks by a primitive railway operated by horses in 1795. A bridge of this railway and many identifiable parts of its route survive within the area.



The earthwork remains of the terraces of Hill's Tramroad, near Garn-Ddyrys
©Cadw

In 1792 the Brecknock and Abergavenny Canal was promoted with the intention of providing inland navigation to the upper parts of the Usk valley, just to the north of Blaenavon, linking with the Monmouthshire Canal at Pontymoile. Construction of the canal began in 1797, in which year the first section was completed. The canal's northern terminus at Brecon was opened for local traffic in 1800, and that west of Govlion in 1805, but it was not until 1812 that the section through Llanfoist to the junction at Pontymoile was finally completed. The canal offered a cheaper route to the sea and became an important part of the associated landscape of Blaenavon Ironworks. The Company leased land for two wharves on the section of canal which lies nearest to the Ironworks at Llanfoist and Govilon. The canal fell out of use in 1930, but has now been revived as a popular waterway for holiday cruising, although it has no connection with other parts of the inland navigation network in Britain.

The outstanding feature of the Brecknock and Abergavenny Canal within the proposed World Heritage Site is the basin at Llanfoist, situated on the side of the mountain, and approached up a steep track. It was the terminus of the primitive railway built by Thomas Hill and completed in 1817. By this means, the Blaenavon Company hoped to avoid the high tolls charged by the Monmouthshire Canal, and to reach markets for their coal in the upper Usk Valley and to the east across the English border in Herefordshire. There is a substantial warehouse for storing pig iron and wrought iron bars and blooms before they were loaded on to canal boats. The warehouse is on two stories with direct rail access from the tramroad. There is a tunnel under the canal, some 33.6m long, to accommodate the old parish road. The canal is crossed by a bridge for Hill's Tramroad built of cast iron plates carried on cast-iron T-section girders. The wharf went out of use

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in the 1860s and is now a base for cruising boats. All the principal structures at the wharf are listed, and the international significance of the site in waterways history as an early example of a canal/railway interchange was acknowledged in the report on Canal Monuments prepared for the World Heritage convention by TICCIH and published in 1996.

Thomas Hill of Blaenavon also leased land on the canal for the Ironworks a few years earlier, in 1815, at Govlion where the road from Blaenavon to Abergavenny crosses the canal. He gained permission for a warehouse to be built, and a small building on the canal bank, now listed, is believed to be this structure. After Llanfoist wharf was built, Govlion wharf became the terminus of Bailey's Tramroad, a primitive railway built by the ironmaster Crawshay Bailey in 1821 to link his ironworks at Nantyglo with the canal. Bailey's three-storey rubble stone warehouse of about 1821 is listed, and it is possible to see evidence of how the railway was accommodated at the wharf with an archway into the building. In the woodland south-west of Govlion is a single-arched rubble stone bridge built to carry the railway across Cwm Llanwenarth brook, which is a Scheduled Ancient Monument. An important group of limekilns also stands next to the canal.

In addition to the buildings at the two wharves, all the principal features of the Brecknock and Abergavenny Canal within the proposed World Heritage Site are protected by listing. They include bridges (Nos 95-99), all of rubble stone and dating from the early years of the canal's existence, several sections of embanked aqueduct, a dry dock, and the remains of three limekilns.

Blaenavon Ironworks was served by a dense network of railways which developed from the 1780s onwards, carrying limestone, coal and iron ore to the works, and connecting it to the canals. South Wales played an important part in the evolution of the railway at this time, between earlier timber railed precedents and the public railways of the 1830s and later. Developments took place in civil engineering approaches, the design of track and its bedding, haulage methods and administrative organisation. Many of these are reflected in the physical survival of railways at Blaenavon.

The primitive railway built by Thomas Hill in the years after he began to manage Blaenavon Ironworks in 1812, known as Hill's Tramroad, provides many insights into an important period of technological development, as well as evidence of the history of the Blaenavon Company. Not only did the railway establish a link with the Brecknock and Abergavenny Canal, it improved the means by which ore and limestone could be conveyed to the Ironworks from the north, and enabled pig iron from the furnaces to be carried to the forge opened at Garn-Ddyrys in 1817, where it was converted to wrought iron. To follow the footpath along the course of the primitive railway, on daringly-constructed and almost level terraces on steep mountainsides, is a thrilling experience.

*Thomas Hill IT's wharf and
incline on the Brecknock &
Abergavenny Canal at
Llanfoist. It connected with
Blaenavon Ironworks via Hill's
Tramroad over the Blorenge
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Blaenavon Industrial Landscape

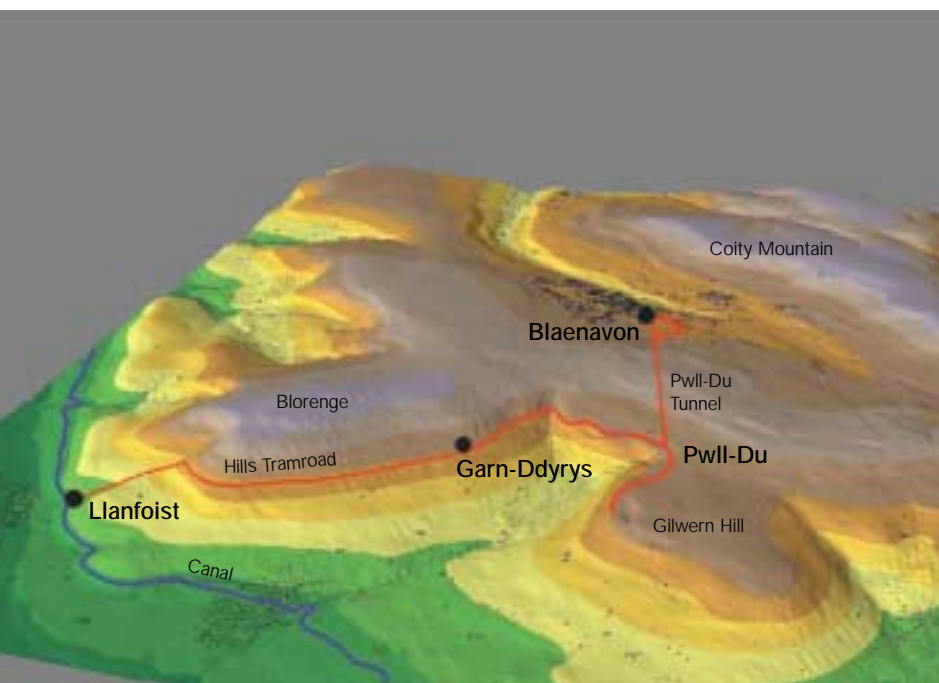
On most stretches the stone blocks on which the rails were mounted remain in situ. The route includes connections to the limestone quarries at Pwll-Du and Tyla and to the forge at Garn-Ddyrys. A series of counter balanced inclined planes take the railway down the mountain to Llanfoist. The 2,400m long tunnel under the mountain at Pwll-Du was the longest ever constructed for a horse-operated railway in Britain. It was developed from an earlier mining level which was already about 1,000m long in 1800. The southern approach to the tunnel is known, ironically, as Marble Arch, and is a Scheduled Ancient Monument. A Blaenavon Company cast iron boundary marker remains in situ near to one of the two northern portals which have been blocked with stone walling. It is believed that most of the tunnel survives intact below ground and an exploration and survey is planned. Most of Hill's Tramroad fell out of use in the 1850s when the main line railway links were established between Blaenavon and Newport. The significance of Hill's Tramroad was recognised by its inclusion on a list of railways of international significance drawn up as a result of a year's research at the University of York and confirmed at a meeting of experts from a variety of countries at the National Railway Museum in the spring of 1998.

Computer generated illustration showing Hill's Tramroad. This was a considerable engineering work with a tunnel 1.6 km long, and a series of incline planes down to the canal at Llanfoist
© Crown Copyright: RCAHMW
based on OS plan

There are many other remains of primitive railway systems in the Blaenavon area. Stone blocks, cast iron sleepers and wrought iron and cast iron rails can still be observed from track beds and wastetips. Many of these artefacts have been removed and conserved as important evidence of railway evolution. Bridges of stone and cast iron survive and the location of perhaps the world's first multi-arched railway viaduct, built c1790, has recently been identified. The route of many railways can be followed and the density of the network that was developed can be appreciated. The Blaenavon Company's primitive

railway system was largely reorganised by the manager Richard Johnson in the 1850s. Two steam locomotives replaced sixteen of the Company's hundreds of horses, and cast iron L-shaped railways mounted on stone blocks or cast iron sleepers were replaced with rolled wrought iron rails on wooden sleepers. A steam hauled double incline was built c1850 across the mountain to replace Pwll-Du tunnel. The remaining railway network within the Blaenavon Ironworks retains much trackwork of mid-nineteenth century date, and provides valuable evidence of the railway technology of that period.

From the mid 1850s, Blaenavon, like most towns in Europe, came to rely for both passenger and freight transport on standard gauge, steam-powered railways. It is fitting that the operation of such railways is demonstrated on a short stretch of preserved line located between Blaenavon Ironworks and Big Pit.



3(a)v *The Management of Water Resources*

The blast furnaces at Blaenavon were some of the first anywhere to be blown by steam power rather than by the action of a water wheel. However, water was essential in the operations of the Iron Company and evidence of the ways in which it was used can be seen throughout the landscape.

In an upland setting like that of Blaenavon, which lies high on the watershed, the careful management of water was vital to provide sufficient and reliable supply, even in drought, to operate water balance lifts, carry out scouring, and feed steam engines. Surface and underground drainage was also of the utmost importance for mining operations. Water courses and drains can be seen in many places on the hills above Blaenavon, often with relationships to one another which allow relative dates to be determined. Near all the mineshafts are small reservoirs for water balance and steam engine supply, fed by many kilometres of watercourses which also served to drain the surface.

Engine Pit used underground waterwheels and a steam engine to lift water to a drainage adit, thereby enabling the use of water balances at shafts higher up. The forges of Cwmavon and Garn-Ddyrys both had bellows and hammers operated by water power. The reservoir which supplied water to Garn-Ddyrys is a prominent feature of the landscape at Pen-fford-goch. The reservoir which served Pwll-Du quarry balance lift is also clearly visible and is part of the scheduled site. Above Big Pit, on the side of Coity mountain, Coity Pool was built in 1839 as a reservoir from which the boilers for the steam engines at Forge Side were supplied with water. Water also operated the counter balance lift at Blaenavon Ironworks.

The effective management of water was clearly one of the principal achievements of those who established and maintained the industries of Blaenavon.

3(a)vi *Vertical Integration: the Forging Side of the Iron Industry*

The blast furnaces at Blaenavon Ironworks produced pig iron, a form of cast iron which has a carbon content of about 4% which can be cast in moulds, and is strong in compression but weak in tension. The principal demand in the early years of the nineteenth century was for wrought iron produced by further refining the product, a chemically pure form of the metal, which is weak in compression but strong in tension. Until the 1770s, processes for forging wrought iron from cast iron involved the use of charcoal. The first process which used only coal was the so-called 'stamping and potting' method, patented in 1772. The alternative method, puddling, by which cast iron was melted in a reverberatory furnace, then stirred and worked until it reacted violently giving off blue flames and taking on a putty like consistency, at which point it was shingled under a heavy hammer, was patented by Henry Cort of Fontley Forge in Hampshire in 1784. Cort's process was widely adopted in South Wales and was responsible for the success of the region in rapidly increasing production of wrought iron to become its leading supplier. There are substantial remains connected with three forges of varying dates in the Blaenavon area.

The forge at Garn-Ddyrys, alongside the primitive railway built by Thomas Hill to link Blaenavon with the Brecknock and Abergavenny Canal at Llanfoist Wharf, came into operation in 1817. Pig iron from the Blaenavon Ironworks was taken through the tunnel



Aerial view showing reservoirs which served Garn-Ddyrys Forge and the balance lift at Pwll-Du Quarry (foreground)
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at Pwll-du to Garn-Ddyrys to be forged into wrought iron, which was taken along the railway to the canal. The forge was making about 200 tons of iron a week in the early 1850s. It was closed in the early 1860s after the establishment of the Company's Forgeside works. The forge stands on a bleak hillside at an altitude of some 400m. The principle features of the site are some extraordinarily sculptural blocks of solid



Aerial view of Garn-Ddyrys Forge, showing the reservoir below the turnpike road, slag tips, the Forge platform, and the route of Hill's Tramroad through a tunnel under the site

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ironworking waste, one of them 4m in height, remnants of the ponds which formed part of the forge's water power system, the ruins of a manager's house and workers' cottages, and traces of the primitive railway connections to the site, including an intact tunnel built to carry Hill's Tramroad underneath slag tips. An excavation by local archaeologists in 1970 uncovered the foundations of a puddling furnace and other underground remains, water wheel pits, furnaces and rolling mills, which are substantially intact. Garn-Ddyrys offers great archaeological potential to enhance understanding of the development of puddling and rolling processes in the early nineteenth century. The forge, together with a nearby section of primitive railway is a Scheduled Ancient Monument.

To the south of the town of Blaenavon is Cwmavon, where there was a forge linked with Blaenavon Ironworks, probably employing the puddling process, which operated from about 1804. Its first phase of

activity appears to have been quite short, but it was revived in the 1820s, from which time it was linked with the Varteg ironworks to the west. Forge buildings were usually insubstantial, and there are no remains above ground at Cwmavon, but the site has remained undeveloped and the remnants of the forge's water supply are intact. A terrace which originally consisted of twelve dwellings, built for the forge workers c1804, was repaired by the British Historic Buildings Trust in 1987-88, and has been described as the finest surviving terrace of early workers' housing in the South Wales Valleys. A more substantial dwelling, Cwmavon House, was built for the ironmaster who revived the forge in the 1820s. At this time the Varteg Company operated a foundry and engineering works on the site at Cwmavon capable of boring steam engine cylinders. The important beam engine displayed on the Pontypridd campus of the University of Glamorgan was made there in about 1840.

In the late 1850s the Blaenavon Company established a new ironworks on the opposite side of the valley from its original furnaces at a site which became known as Forgeside. Forges and rolling mills were moved here from Garn-Ddyrys. The new works was able to make up to 500 tons a week of iron rails, tyres for railway wagons and carriages, and plates for boilers and ships. In 1868 the first of several blast furnaces on the site was blown in, and five years after this there were at the two sites ten blast furnaces, 89 puddling furnaces and eight rolling mills. In 1880 the Company began to make mild steel by the Gilchrist Thomas process invented at Blaenavon, which the Company was in the unique position of being able to use without royalty payments. The Forgeside works continues to operate on a modest scale in new buildings and parts of the original tyre mills. Others of the early buildings remaining are Coity House, probably built between about 1840 and 1860 for the works manager, a power station of about 1920, and most of the workers' housing.

3(a)vii Workers' Housing

A variety of workers' housing, some from the earliest years of ironworking, remain within the landscape at Blaenavon. The Blaenavon Company had of necessity to provide housing for its workpeople in the early years of its operation, since the area was only sparsely inhabited before the 1780s. The resultant settlement patterns are typical of the accommodation of workers at the ironworks of South Wales, which were among the fastest growing settlement of the Industrial Revolution. The population of Monmouthshire doubled in just ten years after 1810, and the majority of this growth was concentrated in new ironmaking communities such as Blaenavon. The Blaenavon Company usually built dwellings very close to its ironworks, mines, quarries



or transport routes. An urban centre therefore developed only gradually. Whenever possible the Company seems to have attempted to construct houses outside the parish of Llanover, in which the furnaces were situated, so that it might avoid paying excessively high poor rates in periods of unemployment. The Company chose instead to build in Llanwenarth or Llanfoist, where it had less rateable property.

Life in Engine Row (Stack Squaree) about 1840
©Cadw



Aerial view of Cwmavon House and Forge Row (right). The site of Varteg/Cwmavon Forge is just below the main road, opposite Forge Row
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Blaenavon Industrial Landscape

Adjacent to the Ironworks stands Stack Square and Engine Row, a small group of solidly constructed stone cottages, incorporating patterns of building, notably door and window heads, characteristic of the West Midlands in England alongside more local building practices. The houses were probably erected in 1788 for the first skilled workers who operated the furnaces from the time they were built. Amongst the early inhabitants was Joseph Hampton from the Stourbridge area of Worcestershire, who was superintendent of the Ironworks for nearly 30 years before his death in 1832. The houses form a square into which a 50 metre high chimney stack for a new engine house was placed in 1860, the base of which can still be seen. The central range of the square was originally the Company office, shop and manager's house in 1788, and was converted to dwellings in the 1860s, which were of a much smaller size than the skilled workers' homes which surrounded them. The whole square is a Scheduled Ancient Monument in the care of the state and has been carefully conserved.

Aerial view of Forge Side showing layout of industrial housing. The original forge site now houses a precision engineering company producing quality steel components for the aerospace industry (located in the new buildings on the right). Big Pit Mining Museum can be seen at the top, centre of photograph

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The very primitive buildings which were contemporary with Stack Square, some of them single room back to back houses, no longer survive, but in most cases their locations are clearly visible and archaeologically intact. Between 1817 and 1832 the Blaenavon Company constructed about 160 single-fronted, three room, two-storey dwellings, which have been called Blaenavon Company Standard Houses. They were usually built in terraces, some with as many as 30 dwellings, but some with as few as five. The terrace at Cwmavon, probably rebuilt in the 1820s, is the best example of this type of house. The foundations, garden plots and middens of several demolished terraces are archaeologically intact, including those of the 30 dwellings which formed Lower Rank Cottages, near the northern portal of Pwll-Du tunnel, which are a Scheduled Ancient Monument and offer potential for further study of the social archaeology and living conditions of such industrial communities.

Three of the five rows of rubble stone houses built for the workers at Forgeside before 1860 and identified only by the letters 'C', 'D' and 'E' rather than street names remain, rows 'A' and 'B' having been demolished in 1977.

3(a)viii The Town of Blaenavon

The growth of population in the Heads of the Valleys region of South Wales, where most of the ironworks were located, was one of the most dramatic demographic movements of the late 18th and early 19th centuries. Workers were initially housed by the iron companies where their labour was required, and the company shops were the main source of goods. Gradually a number of populous towns with centralised urban services and facilities developed. The characteristic form of these towns was chaotic, dictated by the axes of trackways and railways and the availability of land. Blaenavon is among the best examples of these emerging urban centres in South Wales. The Welsh poet Idris Davies summed up building in this chaos:

*The daffodils dance in gardens
Behind the grim brown rows,
Built among the slag heaps,
In a hurry long ago.*

Urbanism came long after the initial growth of industry at Blaenavon. The town of Blaenavon is largely of mid nineteenth century date. Its buildings reflect powerfully the distinctive culture that had developed in ironworking and coalmining areas of the South Wales Valleys. The only significant link with pre-industrial society in the area is the site of Capel Newydd, a tiny chapel first mentioned in documents in 1577 and demolished in 1863. The turf-grown foundations remain within a rectangular enclosure. It is a Scheduled Ancient Monument.



Aerial view of Blaenavon town centre from the east. The main street crosses the centre of the picture from left to right. The church, works school and ironmaster's house lie at the top left.

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While the town was totally dependant for its living on the Blaenavon Company, it was not a 'company town' in the usual sense of that term. It grew gradually, and did not follow a particular plan. Indeed, much of the town appears to have been constructed on land which did not belong to the Company or to its partners. In the 1840s there were three principle clusters of buildings in the area now occupied by the town, one around the Ironworks, one along the east-west axis, now King Street, where any pre-industrial settlement was probably concentrated, and one around St Peter's Church. The spaces between the three nuclei were gradually filled with buildings which evolved into a recognisable town by the 1850s. A significant development was the naming of the streets in the 1860s.

One group of buildings is closely linked with the first generation of ironmasters - the ironmaster's mansion, church and school built alongside the Blaenavon Railway between 1800 and 1816. The mansion, a substantial stone house known as Ty Mawr, in

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Church Road, was built about 1800 by Samuel Hopkins, son of the first resident manager of the Ironworks, and himself a proprietor from 1798. It was used by the directors of the Blaenavon Company as a hunting lodge until 1924, when it became a hospital supported by the subscriptions of local people. Its large garden at the rear is now a wood. The house is a nursing home and a Listed Building. Coity House at the Forgeside Works and Cwmavon House have already been mentioned as forge managers' houses. Govilon House was the home of the forge proprietor John Harries in 1819 and Llanfoist House was the home of one of the most important ironmasters in South Wales, Crawshay Bailey. The contrast between the housing of the ironmasters and managers and of the employee class can be clearly observed. Many terraces of workers' housing survive intact from the mid-nineteenth century growth of population at Blaenavon. In addition to the town of Blaenavon itself, there are long rows of houses from the 1870s at Garn-yr-erw and other examples on the fringes of the town.

St Peter's Parish Church, built by Thomas Hill and Thomas Hopkins for their work people at Blaenavon in 1804

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The church of St Peter was built in the Gothic style in 1804 by the ironmasters Thomas Hill and Samuel Hopkins. The body of the former was interred in an adjoining vault. Its interior and graveyard reflect the importance of the iron industry in Blaenavon. A cast iron font, bearing the date of the church's consecration in 1805, remains in use, while the galleries are supported by cast iron columns of the mid-nineteenth century. In the graveyard are five iron-topped chest tombs, among them those of the ironmaster Samuel Hopkins and Thomas Deakin, surveyor of the Ironworks. The first vicar of St Peter's, appointed by Hill and Hopkins, was Welsh-speaking, suggesting that many of the first generation of ironworkers had been recruited from the Welsh countryside.

Near to the church stands St Peter's School, built in 1815-16 in memory of the ironmaster Samuel Hopkins by his sister, Sarah Hopkins. A Latin inscription on the facade records its opening in 1815. It appears originally to have consisted of two large rooms, one for boys and one for girls. The adjacent Infants School was added in 1849, and St Peter's Boys' School (now the Ramfield Study Centre) dates from 1860, after which the original building was used



*Lower Broad Street, Blaenavon at the turn of the century
copy photograph F Keen*

Nomination Document

just for girls. This is an unusually early company school building, the oldest known ironworks school in Wales. The Darbys of Coalbrookdale, the celebrated Quaker ironmasters of the Ironbridge Gorge, certainly took an interest in the education of their workpeople's children in the eighteenth century, but they did not take responsibility for constructing a school building until long after 1816.

The growth of Broad Street as a retail and service centre north of the school and church took place in the 1840s and 1850s, taking up freehold land not controlled by the Blaenavon Company and being carried out by independent developers. Streets of new housing built by speculative landlords spread out on either side of Broad Street during the 1850s and 1860s. This building pattern can be clearly seen in the form of the town today, with its slightly more ordered pattern and slightly higher standard than the housing which had preceded it. A particularly good example of a terrace of five mid- to late-nineteenth century shops, Nos. 15-19 Broad Street, remain in good condition. Many new service and retail functions were drawn to supply the growing population of Blaenavon from the mid nineteenth century onwards.



Blaenavon's many chapels provide much evidence of the town's culture in the nineteenth century. As in most industrial communities in South Wales the chapels were important educational as well as religious institutions, providing opportunities for lifelong learning as well as instruction in reading and writing for children. Chapels could also be an expression of ethnic feeling, of the identity of Welsh-speakers working for English entrepreneurs, or of political consciousness for workers willing or unwilling to worship with their employers.

*'Davies Brothers' provisions store, Broad Street, Blaenavon 1896
copy photograph F Keen*

The most venerable chapel building is the Bethlehem Chapel in Broad Street, whose congregation of Welsh-speaking Independents (or Congregationalists) first met (in an earlier building) on Christmas Day 1820. The present church, in the Classical style, with a gallery supported on eight cast iron piers, was opened in 1840. The Horeb Baptist Chapel was built in 1862 to accommodate a congregation whose origins went back to 1807. A baptismal pool remains below the floorboards, and the gallery, like that at Bethlehem, is supported on cast iron pillars. Moriah Chapel in Broad Street dates from 1888, and is also in the Classical style, but it has a more ornate interior. Iron columns with gold painted spiral decoration support a gallery with pierced ironwork balustrades, reached by twin staircases from the entrance vestibule. The chapel built in 1861 by the Bible Christians, a Methodist denomination with its origins in Devon and Cornwall, is now an ambulance hall. It is powerful evidence within the landscape of the feelings of identity of migrants who had moved to the South Wales Valleys from south west England.

The use of the Welsh language in Blaenavon was largely confined to the chapels by the 1860s, and became a matter of dispute between and within congregations in the following decade. By 1900 thirteen chapels in Blaenavon were almost entirely English-speaking, as indeed was the community at large. The census of 1901 recorded a population of 10,010, of whom 857 or 8% were Welsh speakers. Ten years later the population had reached 11,087, of whom only 616 or 5% were Welsh speakers.

Blaenavon Industrial Landscape

Some of the social and educational roles of the chapels in the South Wales Valleys were taken over in the late nineteenth century by working men's institutes. Blaenavon's Workmen's Hall and Institute is the most imposing building in the town. It was designed by E A Lansdowne of Newport. The foundation stone was laid in 1893 and the institute was opened in 1895, although the building bears the date 1894. It was constructed by a local builder, John Morgan, and cost £10,000, which was raised by a halfpenny per week

levy on the wages of miners and ironworkers, who reduced the cost of construction by contributing voluntary labour. The Institute, formally established in 1880, was a successor in Blaenavon to a Reading and Mutual Improvement Society which had a membership of 110 in 1860.

Institutes became widespread in South Wales from the 1890s, and some notable examples were built in the 1920s and 30s with the assistance of the Miners' Welfare Fund. Their culture was adult and male. The characteristic components of an institute building were:

- reference library
- lending library
- reading room for newspapers and journals
- accommodation for indoor games, chess, draughts, and billiards
- large halls with stages for lectures and concerts
- smaller rooms for classes and committee meetings



*Blaenavon Workmen's Hall
& Institute, opened 1894
©Crown Copyright: RCAHMW*

The Blaenavon Institute is in architectural terms one of the best examples in South Wales, and a link with a distinct phase of self-improving working class culture, which was expressed in the second half of the nineteenth century by numerous voluntary associations, amongst them a choral society, several brass bands, a benefit society, a volunteer rifle corps and a cricket club. The town of Blaenavon retains many other buildings which relate to its history in the nineteenth century, including a Police Station and Magistrates' Court of 1867, and a number of historic public houses, whose number the Blaenavon Company attempted to restrict.

Almost all the principal buildings in the town of Blaenavon noted above are listed, and the town is designated as a Conservation Area.

3(a)ix Llanfoist

Parts of the village of Llanfoist are included in the area proposed for designation. These include several buildings linked with the iron trade, which are complementary to those at Blaenavon. The graveyard of the medieval church of St Faith includes a memorial to Crawshay Bailey (1789-1872), one of the most celebrated and indeed the most notorious of South Wales ironmasters, a determined opponent of legislation designed to ensure workers' safety. Bailey spent his last years at nearby Llanfoist House.

3(b) *History and Development*

The area around Blaenavon is one of the finest surviving examples in the world of a landscape created by coalmining and ironmaking in the late eighteenth and nineteenth centuries. The parallel development of these industries was one of the key dynamic forces of the world's first Industrial Revolution, and South Wales was among its leading centres. The development of the main components of the site has been described in detail in section 3(a). This section provides a brief historical summary.

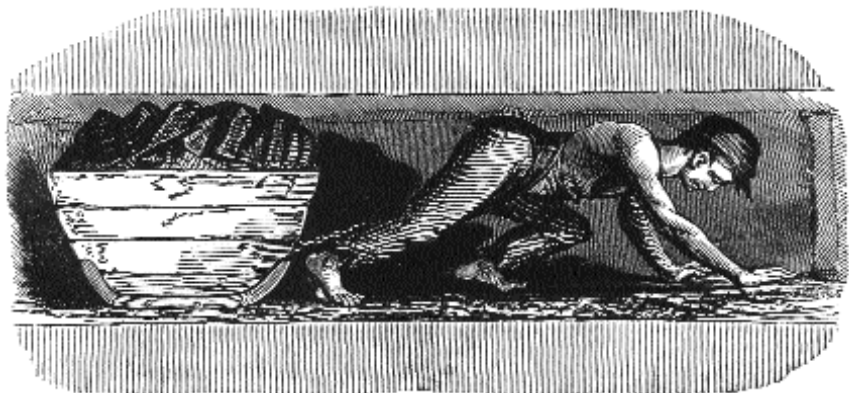
For over a century, the natural landscape of Blaenavon was changed and scarred by ironmaking, coal extraction, settlement and related activities as the entire area of the proposed World Heritage Site was turned to the demands of a single new industrial enterprise and the radical transformation of land and society which followed in its wake.

From at least 1675, and probably earlier, iron ore was extracted on the mountains of Blaenavon. The mineral rights over the common lands of the lordship of Abergavenny were exercised by the Hanbury family, ironmasters and tinplate manufacturers of Pontypool, to supply their charcoal fired furnaces. However, the area was virtually unsettled and used only for small scale iron mining and grazing.

In 1788 Lord Abergavenny leased the common lands, 'Lord Abergavenny's Hills', to Thomas Hill, Thomas Hopkins and Benjamin Pratt. These three entrepreneurs saw the opportunity to build a major new ironworks at Blaenavon, putting into practice the latest technology and organisation of the Industrial Revolution in a new and resource-rich setting. By 1789 the Ironworks consisted of three blast furnaces utilising steam power. It was immediately the second largest ironworks in Wales and one of the largest in the world. From within the company's own mineral properties were drawn iron ores, fireclay, coal and limestone. By 1796 the furnaces were producing 5,400 tons of iron a year. Houses were built beside the company's ironworks, mines and quarries for key workers, and a dense network of primitive railways was created to carry raw materials to the works and products towards markets. Population grew rapidly through the migration of workers from rural areas of Wales, from the industrial Midlands, Ireland, Scotland and rural England. A rapidly created industrial landscape grew up of iron ore patches, coal mines, limestone quarries, iron forges, brickworks, tramroads, watercourses, and workers' houses, all controlled by the Blaenavon iron company.

By 1812 there were five furnaces capable of making 14,000 tons of iron a year. New primitive railway connections were made with the Brecknock and Abergavenny Canal through the 2.4 km long Pwll-Du tunnel, the longest ever built on a horse drawn railway. The Garn-Ddyrys Forge to convert pig iron to wrought iron was built on the mountain north of Blaenavon in 1817. Adit mining for iron ore and coal developed on a larger scale, replacing surface scouring, and shaft mines were introduced, with sophisticated drainage, haulage and ventilation arrangements. New sources of limestone were explored

Etching of young boy underground pulling a sledge on which is a tub full of coal
©NMGW



Blaenavon Industrial Landscape

and larger quarries opened. During the 1840s and 1850s the scattered housing of the workers and the works' school, church and chapels were complemented by the evolution, on land outside the company's ownership, of a town with a variety of urban functions.

In the 1860s, the Company brought into production a new steelworks across the valley at Forgeside, making the old ironworks increasingly redundant and protecting it from redevelopment. In 1878, Sidney Gilchrist Thomas and Percy Gilchrist invented at

Blaenavon the 'Basic' or 'Thomas' process, which was of world-wide importance in permitting phosphoric iron ores to be used in bulk steelmaking. The scale of production expanded, with consequent growth throughout the mineral operations of the company, and the iron products of Blaenavon and the skills of its workforce continued to be exported throughout the world. Big Pit was sunk to serve the new works, and the new settlement of Forgeside was built by the company. Blaenavon parish had a population of 11,452 in 1891, which had grown from almost nothing since the Ironworks was constructed. The social development of the area had by now created a thriving urban culture with many chapels, schools, pubs, and tradesmen, and a Workmen's Hall and Institute was built in 1895 to provide social and educational facilities.



*A jovial, informal group at the Royal Exchange public house in James Street, c1910
Copy photograph F Keen*

Relative decline of steelmaking from around the turn of the century permitted the growth of coal production for export. Demand for the high quality steam coals of South Wales continued to grow, and the industry reached a peak in 1913, at which time coal mining employed directly 250,000 people in Wales, or one in four of the adult male population. Big Pit was enlarged, and after the Nationalisation of the British coal industry in 1947 it was further expanded. Nevertheless, employment in the area was falling, and the population has declined continuously since its peak in 1921 of 12,500. There are now 6,000 inhabitants. Steel production ceased in 1938, and Big Pit, the last substantial working colliery, closed in 1980.

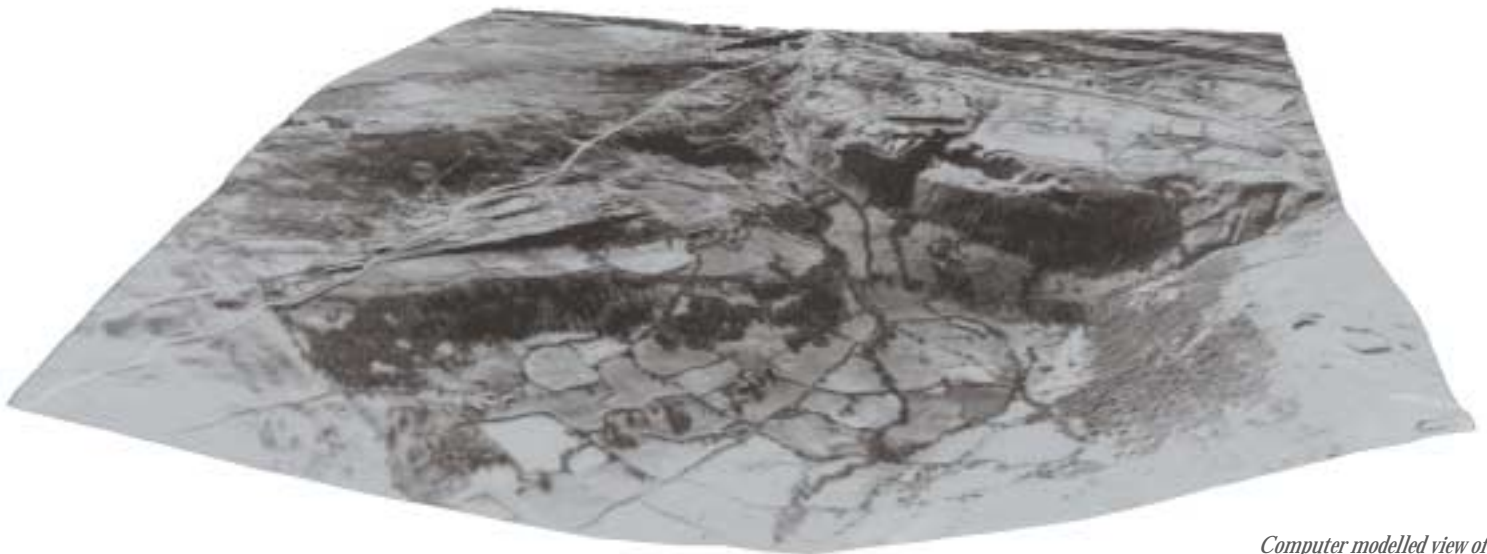
Economic and social decline has meant that much of the fabric of the town is in need of investment, but the development of new industries, the opening of Big Pit as a Mining Museum in 1983 and the conservation of Blaenavon Ironworks have contributed to economic regeneration. The town and the surrounding landscape have survived little altered to represent the story of their past. The recently formed Blaenavon Partnership is implementing a Heritage and Regeneration Strategy which will both conserve the historic assets of the Blaenavon Industrial Landscape and contribute to its continued economic and social revival.

3(c) *Form and Date of Most Recent Records of Property*

Up to date records have been made of the site as a whole, and its most important components in detail. Recording has been carried out by the responsible government agencies and by individual archaeologists, and has included aerial mapping using Geographical Information Systems (G.I.S), aerial photography, documentary record, ground photography, photogrammetry, drawn survey, archaeological excavation and database record. Substantial and comprehensive survey work undertaken since 1990 is referred to below.

Blaenavon Landscape Survey

The Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) is the national body of authorised survey and record in Wales. Its aim is to compile and make available a comprehensive archive and a national database of ancient monuments and historic buildings in Wales. RCAHMW has recently completed the



Computer modelled view of Cwm Llanwenarth and Pwll-Du from RAF photograph taken 1948. The original photograph was taken from a vertical angle. This has been draped over a contour model of the valley to give an oblique/three-dimensional image
© Crown Copyright: RCAHMW

computerised mapping of the entire contents of the first Blaenavon Landscape Survey carried out by Cadw in 1979. This is being supplemented with archaeological information about the whole area of the nominated site. The survey incorporates information shared with other recently completed surveys listed below. It provides a high quality, comprehensive landscape survey of heritage assets which is at present unparalleled in any other part of Britain. RCAHMW has also compiled extensive photographic and aerial survey records of the Blaenavon Industrial Landscape and carried out a fresh aerial survey over the period July 1998 to April 1999. Its trial air

Blaenavon Industrial Landscape

photo mapping survey in 1998 of part of the Blaenavon site has been a research project to map a trial section of the Blaenavon Industrial Landscape 'to test the application of air photo mapping for the recovery of detailed first level plans of this type of area'. The trial site is two sq km at Pen-fford-goch which represents some of the earliest mining activity at Blaenavon. The site encompasses a range of archaeological features found in the wider Blaenavon Landscape including bell pits, hushes, dams, water systems and extensive spoil tips. The resultant computerised maps permit the analysis of the phasing of features in this complex landscape.

Register of Landscapes of Outstanding Historic Interest in Wales

Blaenavon was one of the landscapes identified in the *Register of Landscapes of Outstanding Historic Interest in Wales*. The register was published by the Welsh Office on 31 January 1998 as a collaborative project between Cadw, the Countryside Council for Wales and ICOMOS United Kingdom. Wales is believed to be the first country to produce such a register. The document includes a landscape description and a statement of content and significances and is intended to inform local government policies and the planning process. The area defined is closely related to that proposed for World Heritage Site Status.

Scheduled Ancient Monuments of National Importance

Cadw, on behalf of the Secretary of State for Wales is responsible for compiling a schedule of ancient monuments in Wales under Section 1 of the Ancient Monuments and Archaeological Areas Act 1979. There are twelve Scheduled Ancient Monuments within the identified Blaenavon Industrial Landscape and a number of others are under consideration or are in the process of being scheduled. Descriptive and photographic records are kept of all these sites, and a regular programme of monitoring is undertaken including oblique aerial photography.

Listed Buildings

Cadw is also responsible for compiling the schedule of 'Listed Buildings of Special Architectural or Historic Interest' under the provisions of Section 1 of the Planning (Listed Buildings and Conservation Areas) Act 1990. Listing of buildings in Blaenavon was comprehensively reviewed in 1995, and at Llanfoist in 1997, and the list is now considered to be up to date. There are 82 Listed Buildings within the Blaenavon Industrial Landscape. Photographs and written descriptions of each building at the time of listing are maintained by Cadw, and further monitoring is carried out by each of the relevant local authorities and the Brecon Beacons National Park.

Conservation Areas

The Blaenavon town centre and Cwmavon village were declared Conservation Areas in 1984 under Section 277 of the Town and Country Planning Act 1971, now replaced by the Planning (Listed Building and Conservation Areas) Act 1990.

Big Pit

A Conservation Plan and Study of Big Pit by the Brooke Millar Partnership, completed in 1999, was accompanied by an Archeological Desk Study of Big Pit by Archaeomedia. These studies provide an up to date base of information about the site including full condition surveys of all structures, drawn and photographic records, and an evaluation of archaeological sensitivity. The studies were undertaken to ensure that the Development Plan being prepared for the Big Pit Mining Museum on behalf of the National Museums and Galleries of Wales fully took into account the industrial heritage of the site. This Development Plan is to be submitted to the Heritage Lottery Fund to secure capital funding for the Big Pit complex over the next three years.

Sites and Monuments Record

The Glamorgan Gwent Archaeological Trust maintains an up to date Sites and Monuments Record of all archaeological sites in the area and acts as advisor to Torfaen County Borough Council on archaeological matters relating to development proposals. The Record shares information electronically with both Cadw and the RCAHMW.

Pwll-Du, Gwent, An Archaeological Desk Top Assessment

An archaeological assessment of key parts of the mountain area at Blaenavon was carried out by the Ironbridge Gorge Museum Trust Archaeological Unit for Gwent County Council in January 1994. This comprehensive study covered approximately 7.5 sq km of mountain land containing much of the early iron extraction areas and spoil tips as well as the 1940s open cast sites. It identified the principal archaeological sites and assessed their vulnerability and importance.

The Quarries, Tramroads and Railways of the Bloreng and Gilwern Hill

A thorough archaeological study of quarries and primitive railways was undertaken by John van Laun from 1996 to 1999 as part of a doctoral research programme supervised by Dr M J T Lewis of the University of Hull. This includes accurate identification and recording of key features of all the limestone quarries and related primitive railways within the proposed site.

The Brecknock and Abergavenny Canal

A Preliminary Heritage Survey of the Brecknock and Abergavenny Canal was carried out by John van Laun Archaeologists of Hereford in December 1997, commissioned by the owners, British Waterways. This survey is an inventory of the main features of historical importance and will ensure appropriate protection of these features in the management of the canal as a navigable waterway.

Studies of Individual Features and Buildings

'Water supply to Garn-Ddyrys Forge', by Paul Wellington 1999. A dissertation for Diploma in Continuing Education (Industrial Archaeology).

'Varteg or Cwmavon Forge', A historical study for Torfaen County Borough Council by John Evans 1999.

'Blaenavon Town: An overview of its growth and development to 1990', for Torfaen County Borough Council by John Evans 1999

Former Council offices. Proposals for use as a Town Library by Gaunt Francis Architects, Cardiff. Photographs and measured drawings.

St Peter's Church. Proposals for conservation and repair with Heritage Lottery Fund Grant. Hook Mason Architects and Surveyors, Hereford. Thorough structural survey and photographic record.

St Peter's School. Repair and restoration study for Torfaen County Borough Council. Hook Mason Architects and Surveyors, Hereford. Structural survey, photographic record and plans.

Numbers 15 - 19 Broad Street, Blaenavon: shops and offices. Repair and restoration study for Torfaen County Borough Council. Hook Mason Architects and Surveyors, Hereford. Structural survey, photographic record, elevational drawings.

3(d) *Present State of Conservation*

The present state of conservation of the Blaenavon Industrial Landscape can be considered under four main headings:

- Blaenavon Ironworks
- Big Pit
- Town of Blaenavon
- Relict Landscape

*Interior of furnace no 2,
Blaenavon Ironworks, looking
towards rear blowing arch
©Cadw*



Blaenavon Ironworks

Blaenavon Ironworks has been in state care since 1975. At the time of coming into guardianship the monument was in a ruinous state. Little or no repair to the masonry structures had been carried out for a century, and stone had been robbed for building elsewhere. Much of the site was buried in rubble and waste.

Since 1975 a programme of excavation, consolidation and repair has been carried out according to current best conservation practice.

Photogrammetry and drawn survey have been undertaken of all features of the site before, during and after conservation work. The site has been treated to emphasise its authenticity as a consolidated ruin, preserving its surviving features. No reconstruction has taken place except where necessary for structural purposes. Wherever possible, all conservation measures are devised to be reversible. Excavations have been limited to features which can be immediately consolidated. Materials and methods appropriate to the character of the monument have been used throughout. A skilled team of masons is employed full time at the Ironworks, and

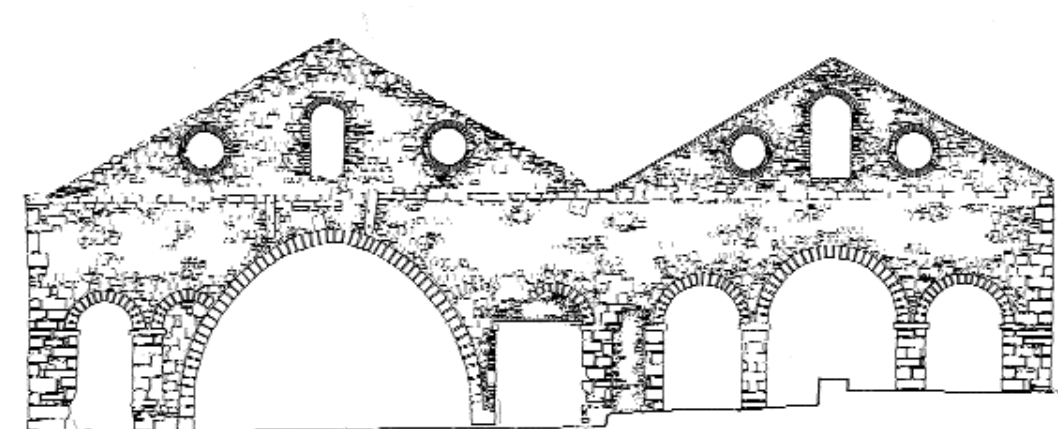
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additional specialist contractors, selected for conservation skills, are drawn in when necessary. A trained conservation architect supported by a trained industrial archaeologist and administrative staff manage the site.

The current programme of work at the Ironworks is focussed on first time conservation to stabilise the structures. Work that has been completed includes the repair and roofing of the cast house and foundry, and all three rows of houses which comprise Stack Square, consolidation of one pair of calcining ovens and the chain store, complete conservation of furnace 2, and partial consolidation of furnaces 4 and 5. The consolidation of the rear retaining wall, and the underpinning of furnace 5 are being undertaken. The pay office is currently being repaired and refurbished as a reception centre for visitors. The consolidation of the water



Stack Square: the subject of recent conservation work
©Cadw



An elevation drawing of the cast houses. The wider building on the left may have been designed from the outset as a foundry. It was later remodelled, with a wide arch inserted in its front wall to improve access
©Cadw

balance tower is in a programme for completion within the next three years. In the longer term, further excavation is expected to reveal the buried remains of the blowing engine house and the base of furnace 6 and the hot blast stoves. Consolidation of these will take place as part of a planned programme to follow immediately after excavation and recording.

Big Pit

The Big Pit Historic Mine Site and Mining Museum, with its winding gear and complex of associated buildings, is exceptionally complete. The buildings on site have been listed as Grade II* or Grade II. The pit shaft and underground galleries represent only one of two sites in the United Kingdom where it is possible for visitors to see original underground coal workings.

Big Pit closed as a working coal mine in 1980 and was handed directly to a museum trust who opened it in 1983. The main attraction of the site is the underground tours conducted



Workmen inspecting Forge Level or River Arch, Big Pit in 1982
©Crown Copyright: RCAHMW

Blaenavon Industrial Landscape

by former miners. In order for public access to be achieved with safety, the shaft and galleries together with winding gear and other equipment have to be rigorously maintained with due attention to their historical integrity. Approximately £4 million capital has been spent on setting up and running the site since 1983, together with £5 million revenue support. The surface buildings are structurally sound but are deemed to require maintenance and repair for which a programme of work has now been devised.

An Archeological Desk Study and a Conservation Plan were carried out by ArchaeoMedia and The Brook Millar Partnership in 1999. These studies fully record the present condition of the site, identify the requirements to protect the heritage resource, and recommend an ongoing maintenance programme. The studies provided key guidance in preparing the Development Plan for the site, to be submitted to the Heritage Lottery Fund for approval of financial assistance.

Town of Blaenavon

The town of Blaenavon is substantially intact in its settlement pattern and housing stock. However, it has suffered due to population loss, economic decline and change in retailing patterns. The town centre has a number of closed shops and many residential properties are in need of repair.



*Lower Broad Street,
Blaenavon. 1999*

The local authority and other agencies as well as private owners have invested in the repair and rehabilitation of properties over the last 10 years to ensure their continued use. The most notable success in the town has been the thorough conservation and enhancement of the Workmen's Hall and Institute with £1 million of repairs during the 1980s. The former Council Office building is currently being carefully converted into a town library at a cost of £350,000. Chapels and churches are important buildings in the town and are generally in good condition. Several have benefited in recent years from grant aided repairs to their fabric, notably St Peter's Church where over £300,000 is being spent to conserve the building fabric with assistance from the Heritage Lottery Fund.

The town centre is subject to a Townscape Heritage Initiative Bid to the Heritage Lottery Fund which aims to achieve nearly £1 million of conservation improvements to town centre buildings. Plans are being prepared to enhance St Peter's School which is the most important building currently at risk from decay in the town. Proposals to conserve the shops at numbers 15 to 19 Broad Street and to improve the condition and enhance the authentic visual character of other buildings in the town centre are also being prepared.

Repairs in the town centre approved under the Welsh Office Housing Renewal Programme (April 1999) will be carried out to a standard which maintains the historic character of the area. The total housing programme is worth £5 million which will be spent over a five year period and will be an important contribution to conserving the fabric of the town's heritage.

Relict Industrial Landscape

The area of coal and iron ore mining and limestone quarrying to the north of the ironworks is visible as a large tract of disturbed land which is now open common and moorland, and includes the Pwll-Du Tunnel, Garn-Ddyrys Forge and Pwll-Du limestone quarry. There are remains of water courses, reservoirs, primitive railways, quarries, scours, adits, shafts and pits, visible throughout the landscape as relict or fossil features. All of these features are now essentially stable and protected from erosion by a gradual process of revegetation. The relict features are not threatened by any active development. The most recent activity affecting this area was open-casting during and after World War Two which produced features which are now themselves of considerable historic interest. Key parts of the relict landscape are legally protected as Scheduled Ancient Monument or Sites of Special Scientific Interest (SSSIs).

Some buildings and other structures within the area are vulnerable to weathering and decay. Torfaen County Borough Council is developing proposals in association with Cadw and respective landowners to carry out conservation work where necessary over the next five years and encourage greater access to the site by interested visitors.

Pwll-Du primitive railway tunnel was reopened and inspected by the Pwll-Du Tram Tunnel Research and Exploration Group (TREG) in 1999. In the next year or so more detailed inspections will be carried out to ascertain fully the condition of the tunnel and devise appropriate repairs, in conjunction with Cadw, from whom Scheduled Monument Consent is required to ensure appropriate standards are followed.

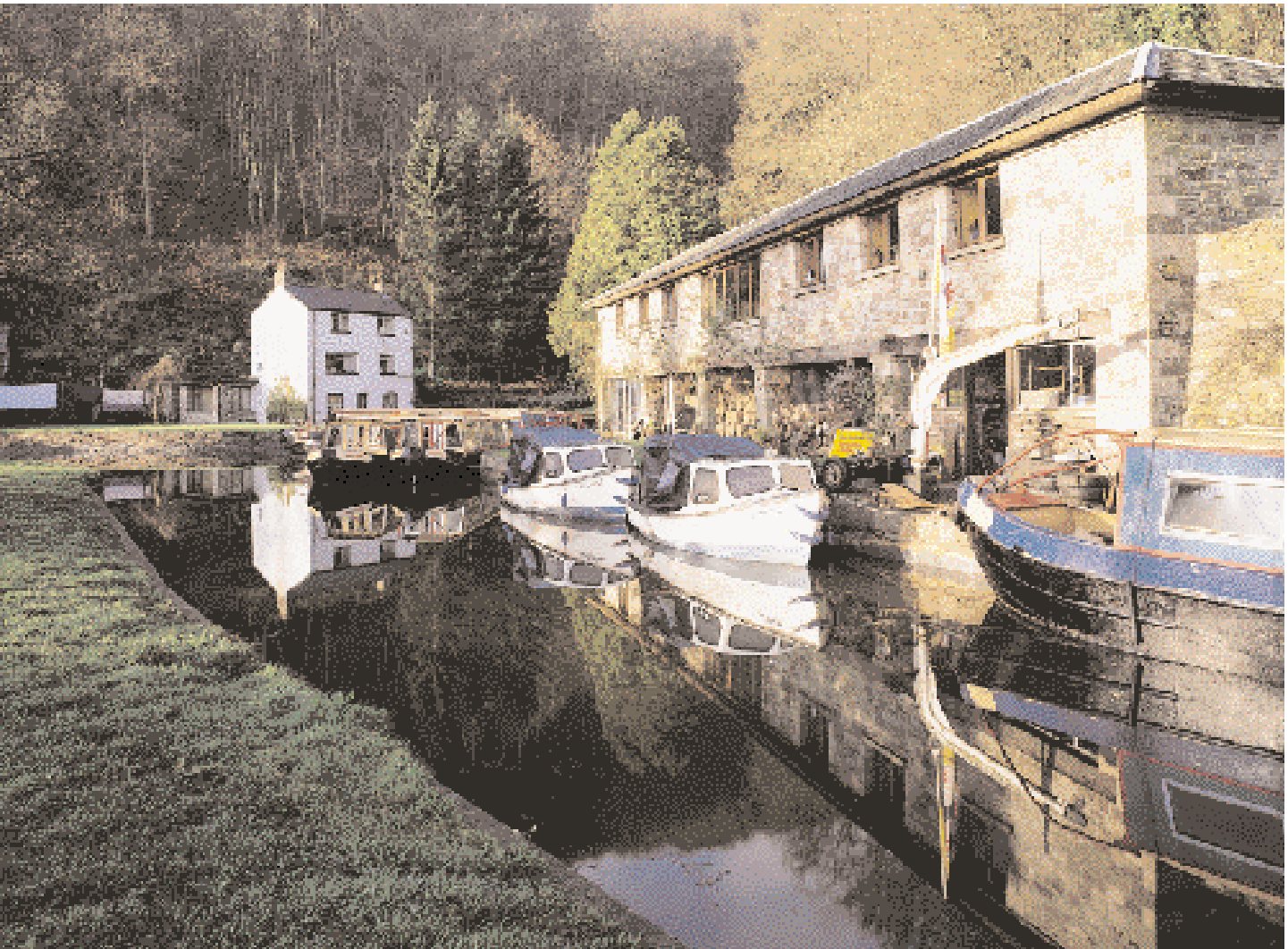


*Landscape north of Blaenavon. Scouring from the early 1800s in the foreground; opencasting from the 1940s in the background. Note the small-holding within the working areas (centre)
© Crown Copyright: RCAHMMW*

Blaenavon Industrial Landscape

At Garn-Ddyrys Forge, excavations by a local archeological group in 1970 recorded important buried remains including those of puddling furnaces and rolling mills. The features are stable and below ground, while the form of the site and its key elements are clearly visible.

The Brecknock and Abergavenny Canal is intact and is maintained by the British Waterways Board. The length of canal within the nominated site has recently been subject to extensive repairs, costing approximately £0.5 million, to ensure the structural integrity of the canal. These repairs were undertaken in consultation with Cadw as Llanfoist Aqueduct is a Grade II listed structure. Management of the waterway has been informed by a recent conservation study and by the testing of all surviving original structures within the nominated site.



*The railway inter-change
warehouse and wharf
keeper's house at Llanfoist
Wharf on the Brecknock
and Abergavenny Canal
©Crown Copyright: RCAHMW*

3(e) *Policies and Programmes Related to the Presentation and Promotion of the Blaenavon Industrial Site*

The prime aim of the Blaenavon Partnership is to protect and conserve this landscape so that future generations may understand the contribution South Wales made to the Industrial Revolution. By the presentation and promotion of the Blaenavon Industrial Landscape it is intended to increase cultural tourism and assist the economic regeneration of the area.

There is clearly considerable scope and opportunity to increase visitor numbers without detriment to the various features which make up the total heritage resource. While individual features such as the Ironworks, Big Pit, the town, the steam railway, the Canal and the landscape, will attract people of different interests in differing ways, the Partnership's aim is to encourage more linked visits and appreciation of the overall context of the heritage landscape. The site is being promoted widely through the combined efforts of the bodies in the Partnership, particularly the local authorities, the National Museums and Galleries of Wales, Cadw, and the Wales Tourist Board.

The two key features of the site are already interpreted and publicly accessible. Blaenavon Ironworks is open to general visitors. While conservation work is in progress, unaccompanied visitors are restricted to the southern part of the site, but parties led by trained guides can approach all of the principal remains. On site interpretation includes open air display panels and a large exhibition which incorporates text, photographs, plans and reconstructions, to show the development of the ironworks and the associated landscape in the context of economic, social and technological history. Cadw has published a fully illustrated 36 page guidebook for Blaenavon Ironworks as part of its award winning guide book series. The guide book was first published to coincide with the Ironworks' bicentenary in 1989 and has since been revised.

A programme of improvement to visitor facilities is currently being advanced which will include the preparation of two large scale models, one showing the Ironworks and the other showing the whole Blaenavon Industrial Landscape, both as they would have appeared in the mid nineteenth century. The current visitor access point is due to be moved to a position closer to the entrance, involving the conservation and use of the former Pay Office. This will also be the Tourist Information Centre for the area. The ongoing conservation programme will permit unaccompanied access to larger areas of the site during the next three years.

Big Pit is one of the most popular visitor attractions in Wales for private visitors and educational groups. The principal focus of its interpretation policy is guided tours led by former miners through the underground workings. These have proved, over the past fifteen years, to be highly popular and informative. The guided tours are supplemented by display panels throughout the surface buildings, by an historical exhibition in the pit head baths and by excellent published guidebook literature. An interactive computer display allows visitors to choose pathways through historical information about the mine



*Interpretation panel at
Blaenavon Ironworks
©Cadw*

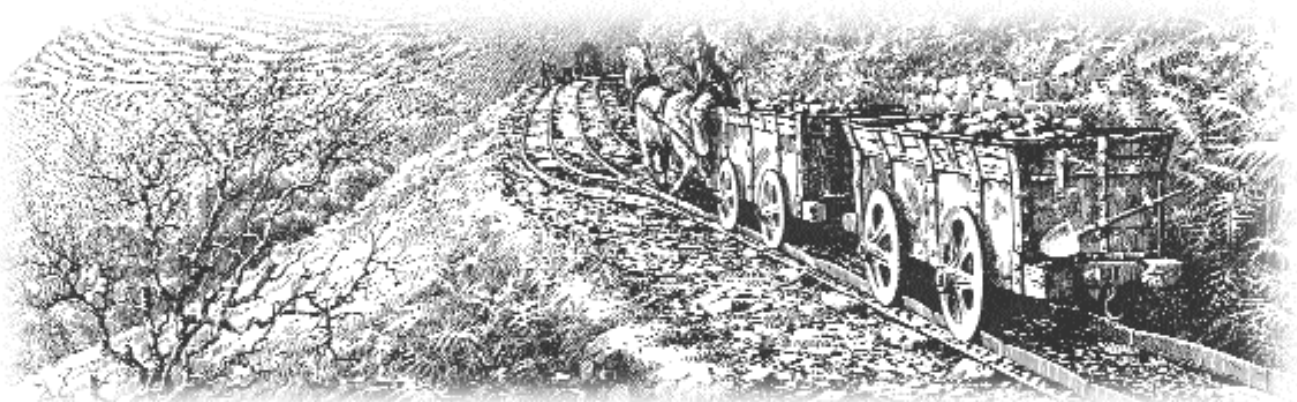
Blaenavon Industrial Landscape

and the surrounding landscape. In an area adjacent to the historic structures a cut and covered display mine has been artificially created which allows the possibility of demonstrating and viewing techniques in mining which could not be safely shown below ground. As part of the large scale redevelopment plan proposed by Big Pit and the National Museums and Galleries of Wales (NMGW), the interpretive facilities of Big Pit are being thoroughly reviewed, and interpretation will be updated and improved further in the next few years. NMGW intend to create at Big Pit a National Mining Museum of Wales of international status and reputation, safeguarding the last deep mine capable of being preserved in Wales and telling the story of Wales' unique and continuing contribution to the coal and related industries throughout Britain and the world. NMGW will bring to the project a total commitment to delivery, excellence in cultural and conservation expertise, and its own national museum status and substantial collections.

The Brecknock and Abergavenny Canal is open to the public as a cruising waterway. Guidebooks available for the canal emphasise its cultural and historical importance.

Several proposals are under development for the future enhancement of the presentation and promotion of the Blaenavon Industrial Landscape. These have arisen from the work of the Blaenavon Partnership in co-ordinating relevant agencies, and from the appointment of specialist consultants. All avenues will be explored to interpret the history of the area in meaningful ways including :-

- Occasional publications will be produced to make available historical research into the history of the Blaenavon Industrial Landscape and its components.
- Archive material will be made available for inspection and copying by students and others at the Proposed World Heritage Site office in the former St Peter's School.
- Existing way marked walks and cycleways will be extended and explanatory leaflets and permanent interpretive panels will be provided to explain the landscape.
- Guided tours of the main sites and landscape will be extended.
- Exhibitions and presentations will be developed, including interactive multi-media.
- Steam railway trips will include interpretive presentations on the historic landscape.
- Re-enactments of nineteenth century work, living conditions and play will be considered.
- Other special events will be presented occasionally including concerts and son et lumière at the Ironworks.



Hill's Tramroad near the top of Llanfoist Inclines. Drawing by Michael Blackmore, published in 'Portraits of the Past'
©Blorance Books

4 *MANAGEMENT*

An established framework of central and local government legislation and planning policies is in place to protect and conserve the Blaenavon Industrial Landscape. This is set out in sections 4(c) and 4(f).

The statutory powers for planning control and protection have been reinforced by the establishment of the Blaenavon Partnership. This is a strong partnership of local authorities, agencies and other bodies which have come together under the leadership of Torfaen County Borough Council to ensure appropriate management of the Blaenavon Industrial Landscape. The Partnership involves the community and landowners in the preparation and implementation of plans for the area. The roles of the partners are fully explained in section 4(d). The Partnership is responsible for the production and implementation of the Management Plan for the proposed World Heritage Site submitted in support of this nomination

The Management Plan looks at the main issues affecting the site and suggests objectives and costed programmes of action necessary to ensure a holistic and co-ordinated approach to management. It provides a clear and positive framework for actions which will ensure that the heritage qualities of this special place are protected and conserved, and that appropriate interpretation and access will be provided for visitors.

4(a) *Ownership*

The Blaenavon Industrial Landscape extends to 3,290 hectares within the nominated site boundary. Due to the nature of the site the ownerships are numerous and diverse in size and character. There is a plethora of interests within the town of Blaenavon, in contrast with the large areas of open land in a few ownerships in the relict industrial landscape. As well as owners, there are significant other users of the buildings and the open landscape, notably Commoners, whose interests have to be considered.

The owners of all the key areas and buildings within the site have been identified and discussions have taken place with them. Positive progress has been made in the context of the Management Plan to ensure agreement on the principle of effective protection, conservation, and increased public access to the site.

Many of the key assets are held safely within responsible public ownership and managed in the interests of conservation.

Blaenavon Ironworks

The site extends to 1.75 hectares. Cadw, on behalf of the Secretary of State for Wales, is the owner and guardian of this site with statutory responsibility for care and maintenance under the provisions of the Ancient Monuments and Archaeological Areas Act 1979.

Big Pit

The Mining Museum site extends to 22 hectares plus railway sidings of 5.6 hectares. The site is owned by a charitable trust. It is proposed that the site will be taken over by the National Museums & Galleries of Wales who have responsibilities for care and maintenance of cultural features and the encouragement of public access and education under the provisions of their Royal Charter.

Town of Blaenavon

The town contains hundreds of separate owners and tenants of residential, commercial and other properties,

including churches and chapels. Several key Listed Buildings such as the Workmen's Hall and Institute, St Peter's School and the former Town Council Offices are in the ownership of Torfaen County Borough Council.

Relict Landscape

The open area of former mineral workings is in the ownership of a few parties. Much of the nominated site is 'urban common', which means the area is unfenced and used by the Commoners for grazing sheep. The common land is also available to the public with free rights of access on foot for air and exercise. Substantial parts of the open landscape are already owned by local authorities. The Partnership has received confirmation from Walters Group, South Wales, the owner of the largest areas of mineral landscape, that the Company will not seek to extract coal from within the nominated site boundary. The Walters Group is willing to co-operate in the protection of the relict industrial landscape and in increasing public access to the area.

Brecknock & Abergavenny Canal

The canal is in the ownership of British Waterways, a public body responsible for the conservation and management of the waterways network.

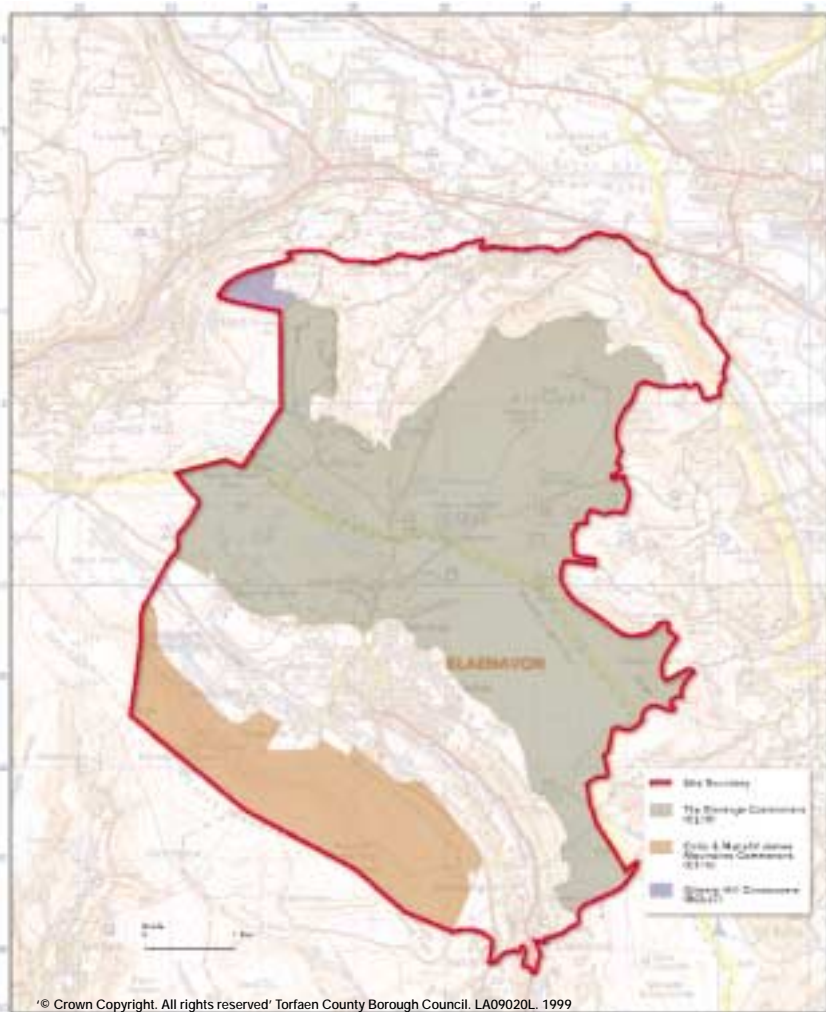
4(b) Legal Status

Nearly half of the proposed World Heritage Site is within the Brecon Beacons National Park and therefore has the highest level of landscape protection.

Within the proposed World Heritage Site there are twelve Scheduled Ancient Monuments of national importance afforded protection under Section 1 of the Ancient Monuments and Archaeological Areas Act 1979. Full details of the Scheduled Ancient Monuments in the area are submitted in support of this nomination. The relict industrial landscape continues to be studied to consider whether further areas or monuments should be scheduled.

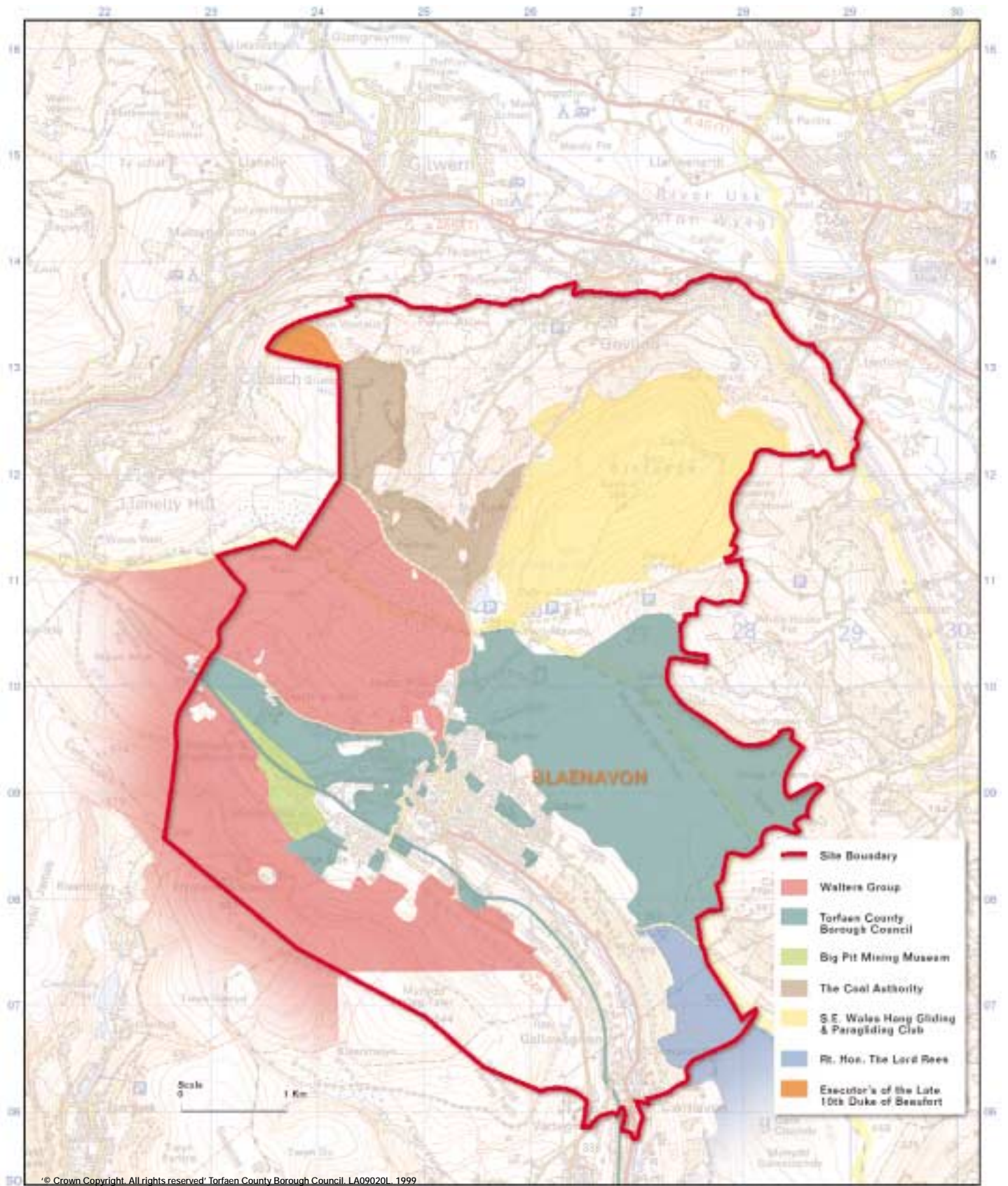
Cwmavon and the town centre of Blaenavon were declared Conservation Areas in 1984 under Section 277 of the Town and Country Planning Act, 1971, now replaced by the Planning (Listed Buildings and Conservation Areas) Act, 1990.

There are 82 buildings within the Proposed World Heritage Site listed by the Welsh Office under the provisions of Section 1 of the Planning (Listed Buildings and Conservation Areas) Act, 1990, as being of special architectural or historic interest. In and around the town of Blaenavon 54 buildings have been listed as being of special architectural or historic merit. There are also 28 Listed Buildings near the Brecknock and Abergavenny Canal.



Common land within the nominated site

Nomination Document

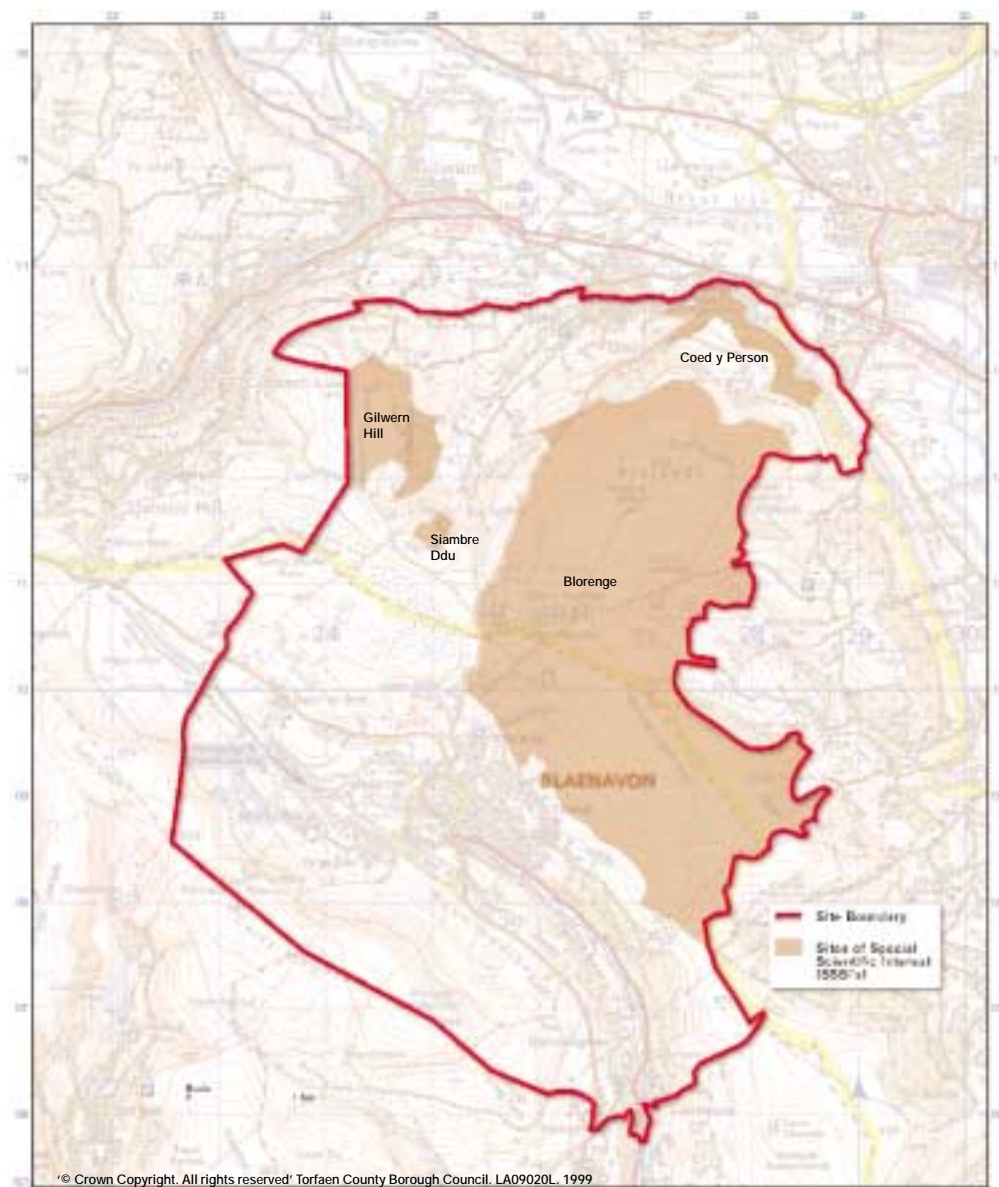


Major land ownerships within the nominated site

Blaenavon Industrial Landscape

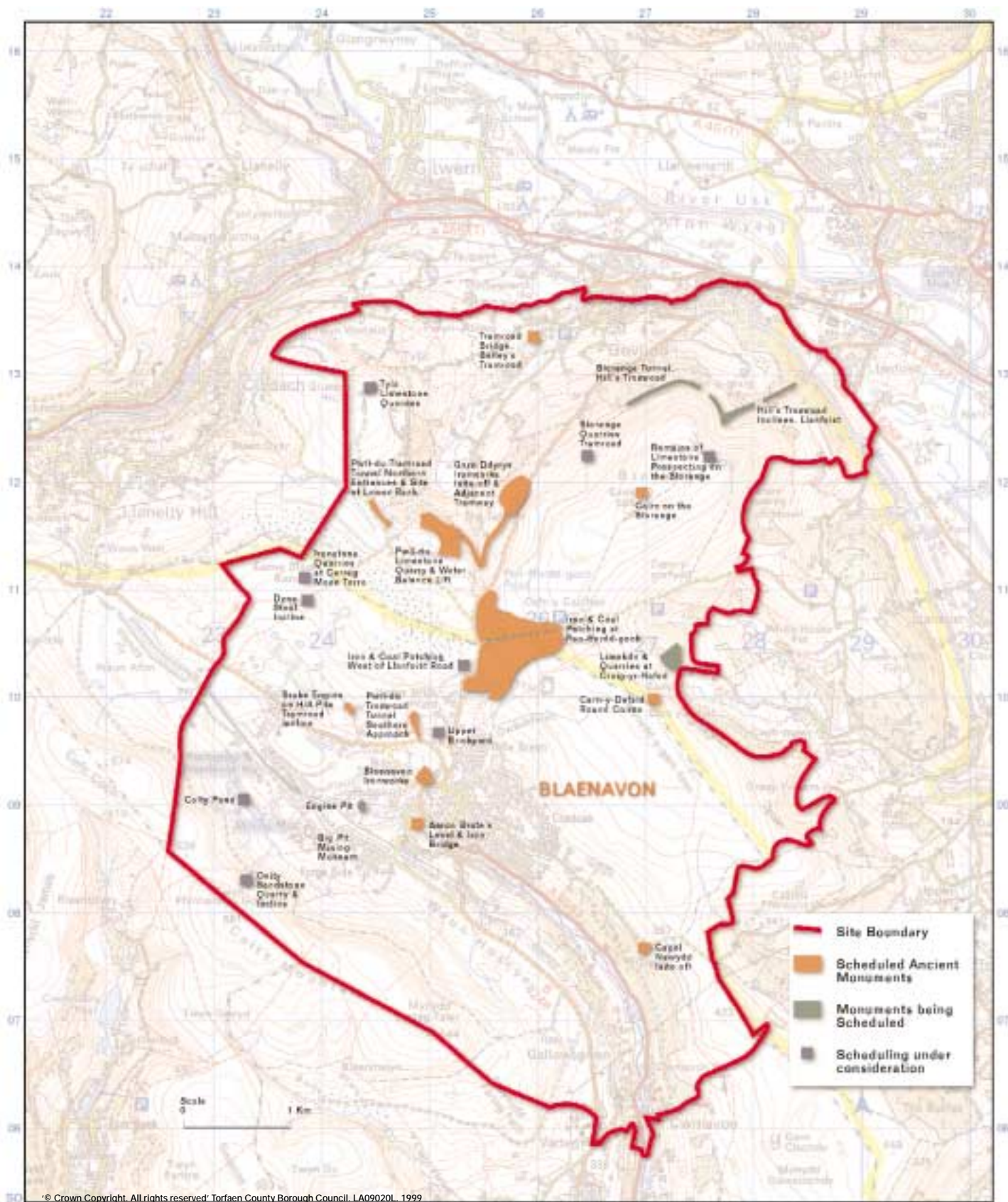
Within the nominated site there are four Sites of Special Scientific Interest (SSSIs). These have been declared by the Countryside Council for Wales (CCW), under Section 28 of the Wildlife and Countryside Act 1981, as amended. The CCW monitor these sites and have powers to ensure that their special conservation interest is being properly managed.

Much of the site is included on the *Register of Landscapes of Outstanding Historic Interest in Wales*, published jointly by the Countryside Council for Wales, Cadw, and ICOMOS UK. While the Register does not entail any statutory controls over development within the site, it is anticipated that it will be taken into account in the Development Plan process, and in the case of Blaenavon will be incorporated as a 'material consideration' in the development control process.



Sites of Special Scientific Interest (SSSIs) within the nominated site

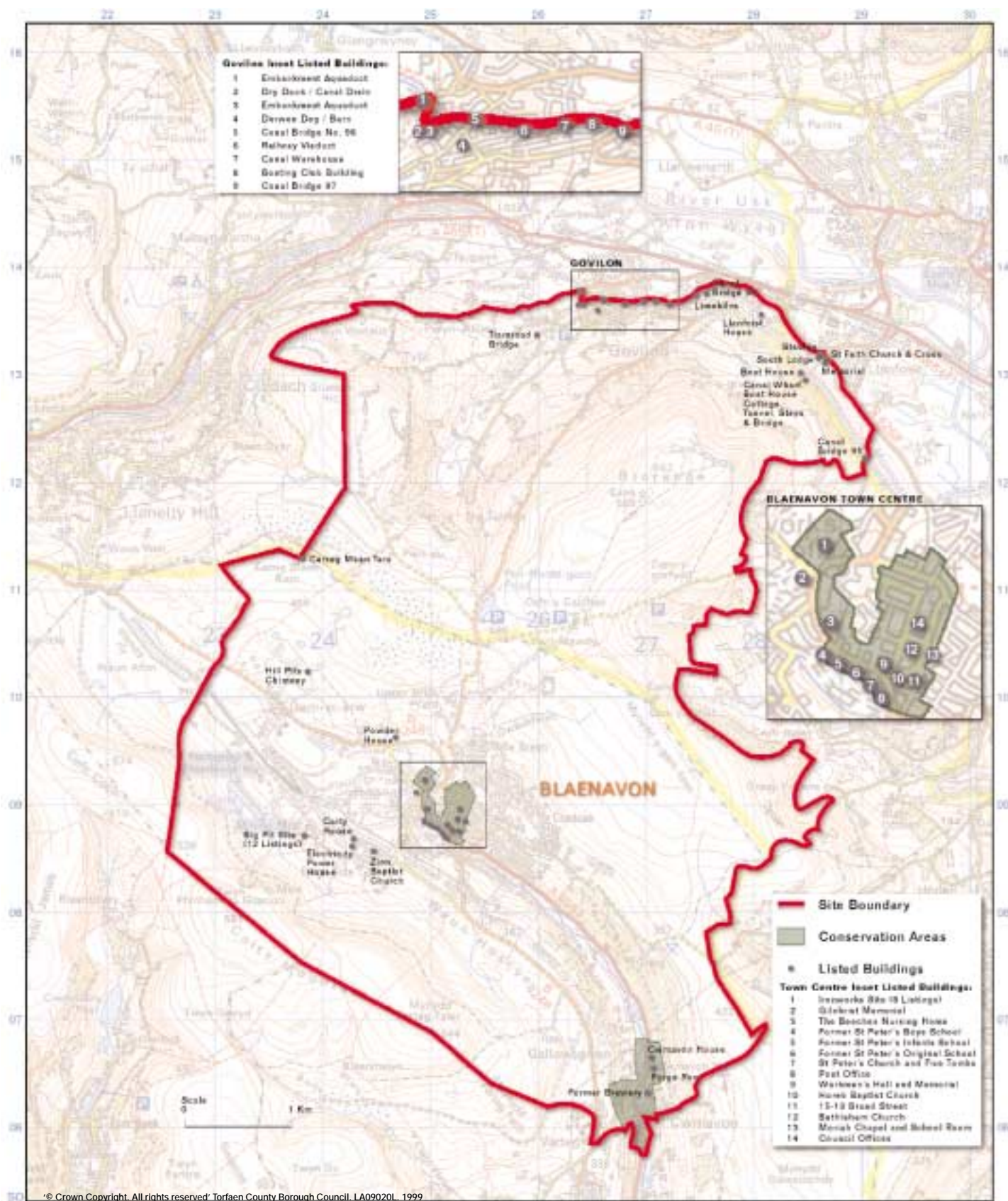
Nomination Document



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Scheduled Ancient Monuments of national importance within the nominated site

Blaenavon Industrial Landscape



Conservation areas and Listed Buildings of special architectural or historic interest within the nominated site

4(c) *Protective Measures*

The nominated site enjoys protection through planning policies set out in development plans, including the Gwent Structure Plan, the Torfaen Local Plan, the Monmouth Borough-Wide Local Plan and the Brecon Beacons National Park Plan. The details of central and local government protective policies are described in 4(f). The United Kingdom planning system operates on the basis of regulating the development and use of land in the public interest and protecting interests of acknowledged importance.

The Town and Country Planning Act 1990 requires that planning permission is generally required for any development in the town or open landscape. Planning applications are determined by the relevant Local Planning Authorities. Determination of applications will be considered in the light of government guidance and development plan policies, see 4(f). To back up these powers of development control, the Planning Authorities can take enforcement action against development which proceeds without planning permission. Enforcement action can be initiated against unauthorised development through legal proceedings with financial penalties against offenders where Enforcement Notices are upheld.

The site includes twelve Scheduled Ancient Monuments and 82 Listed Buildings. The Secretary of State for Wales is required to compile a schedule of ancient monuments and lists of buildings of special architectural or historic interest. The work is undertaken by Cadw: Welsh Historic Monuments. Damaging or carrying out unauthorised work to any of these protected sites is a criminal offence which may be punishable by a fine or period of imprisonment.

Within the site there are four Sites of Special Scientific Interest (SSSIs). These have been declared by the Countryside Council for Wales (CCW) under Section 28 of the Wildlife and Countryside Act 1981. CCW work with owners and other interested parties to ensure effective protection and management of these sites of geological or ecological significance. CCW has legal powers to enforce proper care. Damaging SSSIs is a criminal offence which may be punishable by a fine.

The placing of the Blaenavon Industrial Landscape on the United Kingdom's World Heritage Sites Tentative List clearly recognises the site's importance. If included, Blaenavon will be covered by Welsh Office (Planning Guidance/Wales: Planning Policy – First Revision April 1999, paragraph 5.6.11) which states that:

‘No additional statutory controls follow from the inclusion of a site in the World Heritage List although the inclusion of a site highlights the outstanding international importance of the site as a key material consideration to be taken into account by local planning authorities in determining planning applications and Listed Building Consent applications, and by the Secretary of State in determining cases on appeal and following call in.’

Blaenavon Ironworks and Big Pit have specific plans already in place to protect and conserve them and to increase their enjoyment by the public within their existing beneficial ownerships.

The proposed World Heritage Site Management Plan incorporates these independent plans with the detailed plans for the town, the landscape, and other features, to provide a positive framework for protection, conservation and interpretation. A summary of proposals for the next five years is set out in 4(g), which includes tables of agreed projects and indicative costs.

4(d) Management Authority

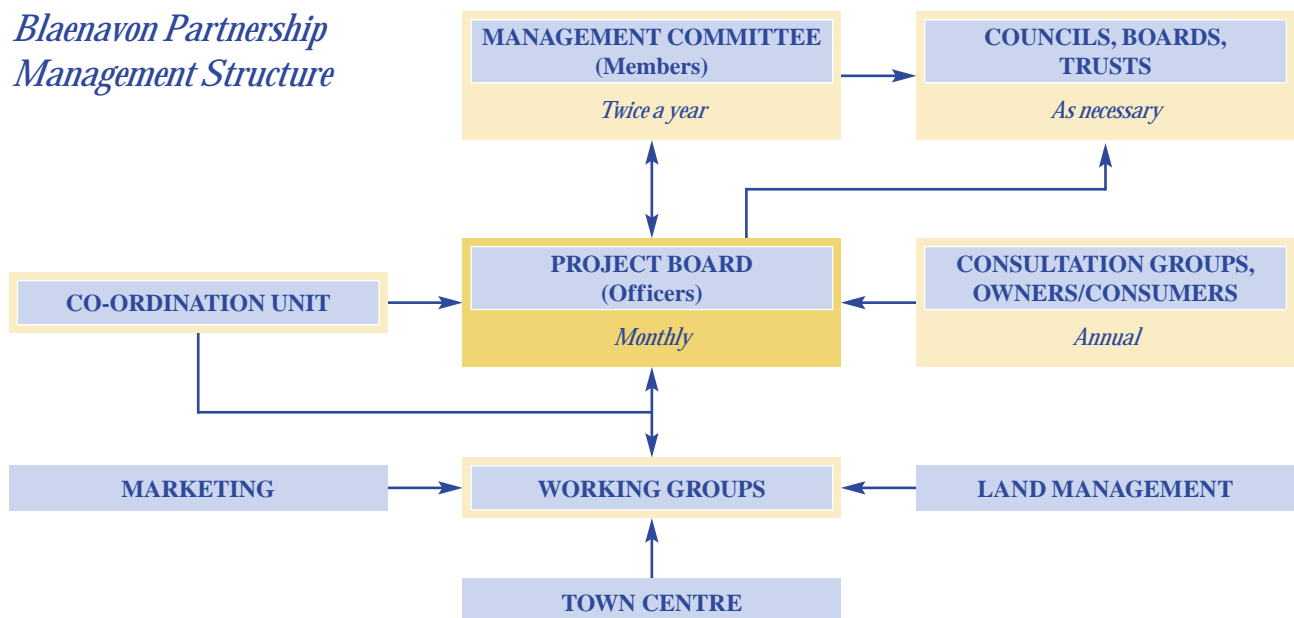
There are a number of local authorities and Government agencies with management responsibilities for, or interests in, the nominated site.

The Blaenavon Partnership

In order that a co-ordinated approach to management of the heritage resource could be achieved the Blaenavon Partnership was established in August 1997. The Partnership now comprises Torfaen County Borough Council, Monmouthshire County Council and the Brecon Beacons National Park Authority which have direct management responsibilities, and Blaenau Gwent County Borough Council which lies just outside the nominated site boundary. The Blaenavon Town Council is also a member.

The Government agencies within the Partnership are Cadw, the Royal Commission on the Ancient and Historical Monuments of Wales, the National Museums & Galleries of Wales, the Countryside Council for Wales, the Wales Tourist Board, the Welsh Development Agency and British Waterways. The Partnership also includes the National Trust, which is the premier non-governmental agency concerned with heritage sites in the United Kingdom.

Blaenavon Partnership Management Structure



Within the framework of the Blaenavon Partnership the Blaenavon Industrial Landscape Management Committee has been established to agree an overall management strategy and recommend policies, plans and projects for implementation by the various partners acting within their own constitutional framework and using their individual executive powers and individual budgets. This advisory Committee meets twice per year.

The executive management for the Partnership is carried out by the Blaenavon Industrial Landscape Project Board, chaired by the Chief Executive of Torfaen County Borough Council. The Project Board includes other chief officers of Torfaen County Borough Council and senior officers representing Cadw and the National Museums & Galleries of Wales. The Countryside Council for Wales and the National Trust and other parties attend from time to time. There are three working groups to deal with specific subjects, which meet as and when required and report back to the main Project Board.

Nomination Document

Since 1997 the Partnership has maintained contact with community councils and groups including business leaders, residents and the local tourist association. The Partnership has also maintained contact with major landowners in the area and commoners associations who have a direct interest in much of the landscape. In implementing the management plan for the proposed World Heritage Site, these contacts will be maintained and a formal meeting will be called annually.

The Project Board is serviced by the Co-ordinating Officer, who is also charged with ensuring co-ordination and continuity of action between the various partners. There is a small budget available to the Project Co-ordinator for day to day management. However, the main expenditure is made by the authorities, agencies and other partners within the Blaenavon Partnership through allocations in their individual budgets to specific projects.

The following list describes the partners and their interests in the nominated site:-

Torfaen County Borough Council (TCBC)

Torfaen County Borough Council is the lead authority in the Blaenavon Partnership. TCBC is the unitary authority for just over 50% of the nominated site (including the town of Blaenavon), and has full local government powers and duties including Town and Country Planning and other environmental matters.

Monmouthshire County Council (MCC)

Just under 50% of the nominated site lies within Monmouthshire, which is a unitary authority with full local government powers. However, planning responsibility for nearly all of this area resides with Brecon Beacons National Park Authority.

Brecon Beacons National Park (BBNP)

About 45% of the Blaenavon Industrial Landscape falls within the Brecon Beacons National Park. The purposes of the National Park designation, as amended under the Environment Act 1995, are to conserve and enhance the natural beauty, wildlife and cultural heritage of the area and to promote the understanding and enjoyment of its special qualities. Account must be taken of the economic and social interest of residents. The National Park is the local planning authority for the area within its boundary.

Blaenau Gwent County Borough Council (BGCBC)

None of the nominated site falls within the Blaenau Gwent County Borough Council administrative area. However, as a near neighbour BGCBC has a close interest in the designation and management of the proposed World Heritage Site.

Blaenavon Town Council (BTC)

This is the local council for the town of Blaenavon which is the main settlement within the nominated site.

Cadw: Welsh Historic Monuments

Cadw is an Executive Agency within the Welsh Office. Its general duties are :

- to secure the preservation of ancient monuments and historic buildings
- to promote the preservation and enhancement of the character and appearance of Conservation Areas, and
- to promote the public's enjoyment of, and advance knowledge about, ancient monuments and historic buildings and their preservation.

Cadw also has direct responsibility as the guardian of Blaenavon Ironworks.

Royal Commission on the Ancient & Historical Monuments of Wales (RCAHMW)

The RCAHMW is the national body of survey and record. Its aim is to compile and make available an archive of Wales' historic buildings and ancient monuments for use by individuals and bodies concerned with understanding, conserving and managing the built environment.

National Museums & Galleries of Wales (NMGW)

The NMGW exists to preserve and promote the heritage and culture of Wales, within a world context. NMGW has a requirement from its Royal Charter to 'promote understanding and knowledge of the special industries of Wales through the collection and conservation of artifacts and their research, interpretation and display'. NMGW will have specific responsibility for the management of the Big Pit Mining Museum. Its special expertise in conservation and management is available on a day-to-day basis to the Blaenavon Partnership.

Countryside Council for Wales (CCW)

CCW is accountable to the Secretary of State for Wales and is the Government's Statutory adviser on wildlife, countryside, and maritime conservation matters in Wales. It is the executive authority for the conservation of habitats and wildlife. Through partnerships, as at Blaenavon, it promotes the protection of landscape, opportunities for employment and the support of those who live in, work in and manage the countryside. It has enabled the Blaenavon Partnership to pursue countryside management projects through grant aid and can assist with the management cost of the Sites of Special Scientific Interest. CCW were jointly responsible, with Cadw and ICOMOS UK, for the preparation of the Register of Landscapes of Outstanding Historic Interest in Wales, published in January 1998.

Wales Tourist Board (WTB)

The Wales Tourist Board has responsibility for development of tourism in Wales.

Welsh Development Agency (WDA)

The Welsh Development Agency has responsibility to the Secretary of State for Wales for promoting and enabling economic development in Wales and dealing with issues related to land reclamation.

British Waterways (BW)

British Waterways has responsibility for management and maintenance of British Waterways Canals, including the Brecknock and Abergavenny Canal. One of the principal remits of the board is to respect industrial heritage.

National Trust (NT)

The National Trust, as the principal United Kingdom non-governmental organisation with experience in heritage management, is able to offer valuable management advice and assistance.

4(e) *Level at Which Management is Exercised*

The lead authority in the Blaenavon Partnership, Torfaen County Borough Council, has adopted management of the Blaenavon Industrial Landscape at the highest level (the Chief Executive, the Director of Development, and the Director of Finance). All other partners have also ensured that senior staff have been allocated to the project and will represent them on the Project Board and working groups. The representatives on the Blaenavon Project Board are listed in the following table which also sets out their level of responsibility within their organisation.

Blaenavon Partnership: Project Board

Dr Clive Grace	Chairman of Project Board, Chief Executive, Torfaen County Borough Council.
Mr Andrew Fretter	Director of Development (Planning and Economic Development), Torfaen County Borough Council.
Mr Michael McLoughlin	Head of Projects Planning and Economic Development Department, Monmouthshire County Council.
Mr Peter Slater	Director of Development and Environment, Blaenau Gwent County Borough Council.
Mr Chris Ledbury	Assistant National Park Officer (Head of Park Management), Brecon Beacons National Park.
Dr Peter Wakelin	Inspector of Ancient Monuments and Historic Buildings (Industrial), Cadw: Welsh Historic Monuments.
Mr Steven Hughes	Head of Survey, The Royal Commission on the Ancient & Historical Monuments of Wales.
Dr Eurwyn Wiliam	Assistant Director (Collections), National Museums and Galleries of Wales.
Mr Peter Walker	Director/Manager, Big Pit Mining Museum.
Mr Stuart Reid	District Officer, Countryside Council for Wales.
Mr Nigel Adams	Head of Development Planning, Wales Tourist Board.
Mr Stephen Roscoe	Senior Project Manager, Welsh Development Agency.
Ms Cathy McLean	Urban Regeneration Officer, Welsh Development Agency.
Mr Richard Dommett	Manager, British Waterways.
Mr Richard Keen	Welsh Culture and Landscapes Advisor, National Trust, and Industrial Archaeological Advisor for the National Trust, Wales, England and Northern Ireland.
Mr John Rodger	Co-ordinating Officer Blaenavon Partnership

Primary Contacts

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Peter Walker
Director/Manager
Big Pit Mining Museum
BLAENAVON NP4 9XP

Tel: +44(0)1495 790311
Fax: +44(0)1495 792618
e-mail: pwllmawr@aol.com

4(f) **Agreed Plans**

The United Kingdom has a comprehensive system of legislation to ensure the effective use of land, control of development and protection of the environment, referred to in 4(c). This is exercised by local planning authorities and other agencies. From central government and supporting agencies to local government, policies and plans are in place which have relevance to the site and effectively legislate for the protection of the area's unique industrial heritage. The development plans referred to have involved the community through public participation in the planning process.

Reference

Planning Guidance (Wales): Planning Policy - First Revision April 1999 Paras 5.4 - 5.7

4(f)i **Central Government Policy and Guidance**

In Wales, control of development and protection of the environment is ultimately the responsibility of the Secretary of State for Wales. Planning Policy is set out in *Planning Guidance (Wales) Planning Policy - First Revision April 1999*. This guidance sets out the Government's land-use planning policies as they apply in Wales. The primary legislation related to land-use planning is contained in :-

- The Town and Country Planning Act 1990
- The Planning (Listed Buildings and Conservation Areas) Act 1990
- The Planning (Hazardous Substances) Act 1990

Planning Guidance (Wales) together with relevant Welsh Office Circulars provides detailed guidance in preparing development plans and exercising development control for the nominated site including:-

NATIONAL PARKS

Where there is irreconcilable conflict between the conservation and enhancement of the natural beauty, wildlife or cultural heritage of a National Park and promotion of opportunities for the public understanding and enjoyment of the special qualities of the park, conservation must take precedence.

HISTORIC ENVIRONMENT

The historic environment which encompasses ancient monuments, Listed Buildings, Conservation Areas, and historic landscapes, parks, and gardens, should be protected. Local authorities should maintain and strengthen their crucial role in securing its conservation. Detailed planning guidance is provided in *Welsh Office Circulars 60/96, 61/96 and 1/98*.

LISTED BUILDINGS

Once a building is listed (or is the subject of a Building Preservation Notice) consent is normally required for its demolition, in whole or in part, and for any work of alteration or extension which would affect its character as a building of special architectural or historic interest.

CONSERVATION AREAS

Local Planning Authorities must designate as a Conservation Area 'any area of special architectural or historic interest, the character or appearance of which it is desirable to

Welsh Office Circular 13/99, National Parks in Wales

Ancient Monuments & Archaeological Areas Act 1979

Planning (Listed Buildings and Conservation Areas) Regulations 1990 SI No 90/1519

preserve or enhance'. Conservation Area designation introduces a general control over the demolition of buildings and it is the main instrument available to authorities to give effect to conservation policies for a particular neighbourhood or area.

Welsh Office Circular
61/96 Planning and the
Historic Environment:
Historic Buildings and
Conservation Areas

Local planning authorities are required to formulate and publish proposals for the preservation and enhancement of Conservation Areas. Policies will normally be needed which clearly identify why the character or appearance of an area should be preserved or enhanced.

1990 Act, Section 69
Listed Buildings and
Conservation Areas

ARCHAEOLOGY

Where nationally important archaeological remains, whether scheduled or not, or their settings, are affected by proposed development, there should be a presumption in favour of physical preservation. Any proposal to carry out works to a Scheduled Ancient Monument must be the subject of an application for Scheduled Monument Consent.

Ancient Monuments
and Archaeological
Areas Act 1979

Welsh Office Circular
60/96: Planning and the
Historic Environment:
Archaeology

4(f)ii Local Authority Development Plans

Although Gwent County Council is no longer in existence, the Gwent Structure Plan 1991-2006 remains the adopted plan as regards strategic policy, in particular for the control of mineral development. Just over half of the nominated site falls within Torfaen County Borough Council's administrative area, for which a Local Plan has been prepared. At the time of writing, the deposit version and subsequent amendments have been to public inquiry and the Inspector's recommendations have been received. Shortly, a Unitary Development Plan will be prepared for Torfaen which will supersede the Structure Plan and Local Plan. The Brecon Beacons National Park Plan, Third Edition 1993-98, and the Brecon Beacons National Park Local Plan, are the relevant planning policy and management documents for the National Park. The Monmouthshire Wide Local Plan is the development plan for less than 5% of the nominated site area. It provides the basis of development control for the village of Llanfoist and prevents development in the open countryside outside the village boundary.

This section focuses on main planning issues influencing the nominated site.

Gwent Structure Plan (Adopted 1 March 1996)

The Gwent Structure Plan has policies on landscape, derelict land and minerals which are important in considering any development proposals within the Torfaen area of the nominated site.

POLICY C6: LANDSCAPE

Development which would have a significant adverse effect on landscapes of historic importance will not normally be permitted, and the enhancement or restoration of such landscapes will be encouraged.

POLICY M1: MINERAL DEVELOPMENT

Proposals for mineral development will be considered against twelve criteria including criterion (vii), the effect on archaeological interests in the area in both the near and long term.

The Torfaen Deposit Local Plan

The main policy with relevance to the control of development within the nominated site is Policy H7 relating to heritage.

POLICY H7: HERITAGE

Development proposals which are of such scale that they would adversely affect or visually impinge upon the overall integrity of the 'Landscape of Outstanding Historic Interest' at Blaenavon will not be permitted.

Reasoned Justification:

The area shown on the Proposals Map has been included in the *Register of Landscapes of Outstanding Historic Interest in Wales*. The area around Blaenavon is considered to be one of the best preserved industrial landscapes in Wales. It contains extensive remains of early mineral works and processing, as well as the remains of the later commercial production of coal, iron and steel. These elements together with the town of Blaenavon, which is one of the best examples in Wales of a valley head industrial community, are considered to form one of the most complete and best surviving historic landscapes in Wales. This landscape is of such importance that it may be accorded World Heritage Site status.

Development in this area will only be allowed where it is in the national interest and where no alternative site is available. There are, however, areas within the defined Historic Landscape allocation which overlap with other policy designations, particularly within the existing built up areas. In these instances the presumption in favour of development accorded by a development proposal's location within the built up areas as defined by logical or designated settlement boundaries, or by its specific allocation in the Local Plan, is not overridden. The only exception relates to land allocated under policy E3/3 where this policy has precedence in terms of landscape improvement areas.

POLICY H1: CONSERVATION AREAS

Development within a Conservation Area will only be permitted where the proposal satisfies all of the following criteria:-

- A the proposal enhances the visual, architectural and historic character of the area.
- B the proposal respects the scale and character of both the surrounding buildings and the Conservation Area.
- C the provision of open space between and around buildings reflects the scale, layout and character of the Conservation Area.

There are also policies which presume against the demolition of Listed Buildings.

POLICY H5: SCHEDULED ANCIENT MONUMENTS

Development on or adjoining a Scheduled Ancient Monument will only be permitted where the proposal would not have an adverse impact upon its setting and character.

POLICY ED9: TOURISM

The following sites within the nominated area are identified for tourism related development:

ED9/1 Big Pit Mining Museum

ED9/2 Blaenavon Ironworks

ED9/6 Garn Lakes

***Brecon Beacon National Park Management Plan Third Edition 1993-98
(Approved January 1993)***

By designating the area as a National Park, Parliament has endorsed the national significance of the Brecon Beacons area. Designation carries a two-fold purpose: to conserve and enhance natural beauty, and to promote the enjoyment of the Park by the public, and a third requirement: to seek to foster the social and economic well being of the local communities.



The following policies in the approved plan have particular significance to the nominated site. The BBNP Management Plan is currently being reviewed but these policies are likely to remain substantially unchanged.

POLICY LN17: EYESORES

The National Park Authority (NPA) will use all available methods to abate and remove eyesores and litter in the Park. The NPA acts directly to deal with these problems caused by local people and visitors through its Warden service and volunteers.

Brecon Beacons National Park, view from Garn-Ddyrys towards Pwll-Du Quarry. Lines of historic tracks and primitive railways can be clearly seen
© Crown Copyright: RCAHMW

Blaenavon Industrial Landscape

POLICY AD1: ARCHAEOLOGY, ARCHITECTURAL & HISTORICAL FEATURES

The NPA will seek to protect all areas, sites and features of historical and architectural interest and importance and their settings. This policy covers all archaeological sites and monuments, areas of known or potential archaeological importance, and historic landscapes.

POLICY AA2: ARCHAEOLOGY, ARCHITECTURAL & HISTORICAL FEATURES

The NPA will encourage the conservation and management of all areas, sites and features of historical and architectural importance and their settings.

POLICY AA5: PUBLIC AWARENESS

The NPA will promote a better appreciation of the historic landscapes, archaeology and vernacular building traditions of the Park and of the need to protect this heritage.

POLICY R1: RECREATION

The NPA will encourage recreational activities which involve the quiet enjoyment of the Park where there is no irreconcilable conflict with conservation, in accordance with the strategy for enjoyment and other policies.

POLICY T2: TOURISM

All visitor development should avoid damage to 'pressure' or 'vulnerable areas', should be well related to the Park road hierarchy, and should conform with the NPA's development control policies.

POLICY IN1: INFORMATION AND INTERPRETATION

The NPA will encourage visitors and those living within or near the Park to understand the value of the Park's special qualities and the way of life in its communities.

POLICY M1: MINERALS

Mineral extraction is inappropriate in a National Park. This has been emphasised repeatedly by the Government since the Park was designated. New or extended mineral working will not be approved unless a case of compelling national necessity can be proved and there are no detrimental effects on the National Park designation, in that:-

- i) the exploitation and proposed use of the resource is vital to the national interests;
- ii) there is no alternative source of supply which is both outside the Park and not visible from within it;
- iii) full consideration has been given to conserving the natural beauty of the Park, and areas visible from it;
- iv) the impact on local communities, recreation resources and surrounding land users, water resources and services has been weighed.

4(g) Sources and Levels of Finance

Since the Blaenavon Partnership was established in August 1997, considerable financial resources and professional time have been invested in developing a comprehensive approach to the management of the Blaenavon Industrial Landscape and setting specific projects in motion. A heritage and regeneration study was prepared for the Partnership by DTZ Piedad Consulting in 1998 and other consultants have provided advice on matters including land acquisition, site appraisals, landscape assessments, building conservation studies and archaeological assessments. These inputs have provided the basis of a management plan for the proposed World Heritage Site. The plan, which has been submitted as a supporting document with this nomination, is in the process of development and refinement. However, the Partnership has identified the main elements within the plan and considered how projects within these areas can be financed.

The four main elements within the management plan are: Blaenavon Ironworks, Big Pit, the town of Blaenavon and the relict landscape. A summary of the development proposals for these is set out below. The tables indicate levels of anticipated expenditure by the Partnership and identify funding sources. The costs are indicative at this point in time and subject to confirmation by various parties.

It is anticipated that in the order of £10 million will be expended within the Blaenavon Industrial Landscape during the next five years on protection, conservation and interpretation of the industrial heritage and improvement of facilities for visitors to the area.

Table 1

BLAENAVON IRONWORKS	Cost Over Five Years 1999 - 2004	
Stabilisation, excavation		Total £780,000
Conservation		
Improved access and interpretation		
Funding Sources	Cadw	

Table 2

BIG PIT MINING MUSEUM	Cost Over Five Years 1999 - 2004	
Restoration, repair, conservation; including underground workings		Total £6,830,000
Improvement of visitor facilities, including catering		
Added interpretation, including multi-media		
Improved storage and conservation facilities for National Coal Mining Collection		
Funding Sources	NMGW, HLF, WO, Cadw, WDA, EU, WTB	

Table 3

TOWN OF BLAENAVON	Cost Over Five Years 1999 - 2004	
Repairs and conservation of Listed Buildings	£1,100,000	Total £1,470,000
Conservation works additional to housing renewal	£120,000	
Townscape improvements to access and car parking for visitors etc.	£200,000	
Interpretation, St Peter's School	£50,000	
Funding Sources	TCBC, HLF, EU, WO, Cadw, WTB, WDA	

Table 3: Does not include repairs under the Welsh Office Housing Renewal Programme (£5 million over the next five years) which will do much to improve the fabric of older housing in the town.

Table 4

RELICT LANDSCAPE	Cost Over Five Years 1999 - 2004	
Acquisition	£25,000	Total £105,000
Improved access	£30,000	
Improved safety	£25,000	
Conservation and interpretation of Scheduled Sites	£25,000	
Funding Sources	TCBC, MCC, BBNP, CCW, WDA, Cadw	

Table 4: The Brecknock and Abergavenny Canal is not included. About £500,000 was expended on maintenance within the nominated site 1998/99.

ABBREVIATIONS IN TABLES

TCBC-Torfaen County Borough Council. MCC-Monmouthshire County Council. WDA-Welsh Development Agency. WTB-Wales Tourist Board. BBNP-Brecon Beacons National Park. EU-European Union. CCW-Countryside Council for Wales. HLF-Heritage Lottery Fund. WO-Welsh Office. Cadw-Welsh Historic Monuments. NMGW-National Museums & Galleries of Wales.

4(h) *Sources of Expertise and Training in Conservation and Management Techniques*

The following list describes the appropriate skills and experience within the Blaenavon Partnership which will ensure the effective protection, conservation, monitoring and interpretation of the proposed World Heritage Site. The Blaenavon Partnership will commission experts to provide additional specialist skills where necessary.

Each of the organisations involved is committed to training and the development of skills ensuring the continuing professional development and training of staff. When the proposed World Heritage Site Co-ordination Unit is established at Blaenavon, support staff will be trained in maintaining records of the site, making information available to visitors and assisting in reviewing and implementing the Management Plan.

Torfaen County Borough Council

The Chief Executive leads the Partnership and the services of the Council's technical, legal, and financial departments are available to the Project Board to ensure the proper management of the area. Where in-house expertise has not been available the Council has contracted specialists to provide advice on heritage assessment protection, conservation and management and will continue to do so as required.

Monmouthshire County Council

The specialist skills of the Planning and Economic Development Department are available to the Partnership. Michael McLoughlin, Head of Projects, is the primary contact officer. His expertise includes building conservation and countryside management.

The Brecon Beacon National Park (BBNP)

The Brecon Beacon National Park has a staff with expertise in countryside management and protection and promotion of the cultural heritage. The BBNP has a Warden Service which monitors and manages areas including parts of the Blaenavon Industrial Landscape. The Key Officer is Chris Ledbury (Assistant National Park Officer/Head of Park Management). The National Park staff includes an archaeologist, Peter Dorling, who is closely concerned with the protection, conservation and interpretation of the area's industrial heritage, a building conservation officer, Mr Will Hughes, and an ecologist, Ms Jan King.

Cadw: Welsh Historic Monuments

Dr Peter Wakelin, Inspector of Ancient Monuments and Historic Buildings (Industrial) leads Cadw's project team at Blaenavon Ironworks, is responsible for Scheduled Ancient Monuments in the area, and offers advice to the Blaenavon Partnership as required. He is supported by a qualified conservation architect, Ms Jane Chamberlain, and a central administrative and management team. Cadw has a team of skilled masons and labourers on site at the Ironworks. Their skills and specialist knowledge of site conditions have been carefully developed, and now provide a valuable technical resource. Additional consultants and contractors are employed at the Ironworks when necessary.

The Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW)

Stephen Hughes, Head of Survey, has taken a close interest in the Blaenavon Industrial Landscape and advises the Partnership on archaeological matters, particularly in relation to records and survey. RCAHMW have recently undertaken a computerised geographical survey of the whole landscape. The Royal Commission will also provides assistance with research and monitoring of the proposed World Heritage Site through the skills of Terry James and David Thomas in computerised mapping and Toby Driver in aerial photography. Record material held in the National Monuments Record is maintained by qualified archivists.

The National Museums & Galleries of Wales (NMGW)

Dr Eurwyn Wiliam is a member of the Historic Buildings Council for Wales, the Secretary of State's advisor on such matters, and is a Commissioner of the Royal Commission on the Ancient and Historical Monuments of Wales. He is Assistant Director of Collections and is directly involved with the Big Pit Development Plan. NMGW has been continuously refining skills in the collection, recording and protection of Welsh history and particularly of industrial sites and artifacts. A coal curator appointed by NMGW will be posted at Big Pit, and his expertise, and that of his colleagues with responsibility for iron and steel, will be available to the Partnership. Peter Walker, the Big Pit director, and his staff, have invaluable experience, in the management of the buildings, shaft and underground workings at Big Pit.

The Countryside Council for Wales (CCW)

Richard Kelly (Historic Landscapes Project Officer) advises the Partnership from his considerable experience of Historic Landscapes. Stuart Reid provides advice on local land acquisition and management issues.

The Wales Tourist Board

The Tourist Board have a valuable role to play in advising the Partnership on tourism development and in some instances providing support funding. The Wales Tourist Board Development Officer, Nigel Adams, is available to provide advice to the Partnership as required.

The Glamorgan Gwent Archaeological Trust (GGAT)

The Trust has responsibility for maintaining a Sites and Monuments Record including all known archaeological sites for the purpose of providing planning advice to the local planning authorities. The Trust has expressed a wish to be supportive of the Partnership's intentions to conserve the Blaenavon Landscape and has stated that the advice of archaeologists in the GGAT is available to the Partnership as may be required.

The National Trust

The National Trust is recognised as the premier non-governmental conservation body in the United Kingdom with considerable expertise in management of historic sites and buildings.

Richard Keen, is the Welsh Culture and Landscapes Advisor to the National Trust and is also the National Trust Industrial Archaeological Advisor for Wales, England and Northern Ireland. He is a member of the Ancient Monuments Board for Wales and of the Heritage Lottery Fund Committee for Wales, and has recently been appointed as a member of ICOMOS UK World Heritage Committee.

Project Co-ordinator

John Rodger ARIBA MRTPI has been contracted by the Torfaen County Borough Council to act as Project Co-ordinator for the Blaenavon Partnership. He has worked in local government and private practice as an architect and town planner. He was responsible for drafting the documents which led to thirteen Conservation Areas being declared in Monmouthshire in the early 1970s. He has managed several conservation projects, and was responsible for issuing historic building grants for the former Gwent County Council and for several projects to preserve industrial archaeological sites and buildings in the Gwent Valleys. He commissioned archaeological studies and reports for the County Council, notably the Pwll-Du Desk Top Study for the Blaenavon Landscape, by the Ironbridge Gorge Museum Archaeology Unit. As a former Director of Planning and Economic Development for Gwent County Council, he has the management experience to present papers to the Advisory Committee when necessary, to effectively service the Blaenavon Project Board, and to co-ordinate the project on a day to day basis.

Blaenavon Industrial Landscape

Mr Rodger attends meetings of the Local Authorities World Heritage Forum (LAWHF) and attends ICOMOS United Kingdom workshops on World Heritage Site Management Plans.

Blaenavon Co-ordination Unit

A small office is being established at Blaenavon to co-ordinate the effective management of the Blaenavon Industrial Landscape. Copy records of the site will be kept and will be available for inspection. The Office will have specific responsibility for maintaining and reviewing the Management Plan and maintaining contact with local communities. A web site will be established in the near future (<http://www.btinternet.com/~b.i.l-tcbc>) and it is planned that use of this technology will be developed as a key tool for recording and providing information.

The office will be run by the Project Co-ordinator with technical and administrative support staff:

- A Secretary/Support Officer
- A record keeper and assistant

It is intended that the Co-ordination Unit office will be in the former St Peter's School following its repair and refurbishment.



*St Peter's Endowed School erected by Miss Sarah Hopkins, in memory of her brother Samuel Hopkins, a well respected ironmaster of Blaenavon. The school was for 'his Blaenavonites' and was opened in 1816
Copy photograph F Keen*



*St Peter's School proposed repair and refurbishment
Isometric drawing by Hook Mason Architects and surveyors, Hereford*

4(i) Visitor Facilities and Statistics

Within the Blaenavon Industrial Landscape there are six main areas of visitor interest:-

- Blaenavon Ironworks
- Big Pit
- Pontypool and Blaenavon Railway
- Town of Blaenavon
- Relict Landscape
- Brecknock and Abergavenny Canal

Visitor figures are available for the first three from 1990-1998, set out in the table below:

YEAR	BIG PIT MINING MUSEUM	BLAENAVON IRONWORKS	PONTYPOOL & BLAENAVON RAILWAY
1990	117,761	-	-
1991	112,351	-	-
1992	120,387	2,929	-
1993	107,551	4,960	-
1994	109,378	4,005	4,500
1995	95,589	3,700	4,717
1996	92,200	3,346	5,015
1997	86,684	2,865	3,517
1998	85,188	2,445	4,726

Blaenavon Ironworks

The site is open to general visitors, currently from 1st May to 30th September and at other times by arrangement. Admission charges are £1.20 for an adult and £3.10 for families.

The site has been subject to considerable conservation work to make the structures stable, during which visitor access has been restricted. The number of visitors estimated for 1998 was about 2,500.

The presentation and promotion of the Ironworks through a published guide book, visitor centre, display panels, and guided tours, has been described in 3(e). A major expansion in visitor numbers up to around 30,000 persons per annum is expected in the medium term. There is free coach and car parking adjacent to the site.



*School party on guided tour,
Blaenavon Ironworks
©Cadw*

Big Pit Mining Museum

Big Pit Mining Museum has proved to be a successful, all-weather, tourist facility for South Wales, attracting about 100,000 visitors per annum. The site is open daily between March and November. Admission charges for 1999 are £5.75 adult, £17 family ticket.



*Big Pit Mining Museum,
underground tour*

The attraction has proved particularly popular with French school parties who comprise about 30% of the total visitor numbers. Big Pit is the most visited mining museum in the United Kingdom. Existing interpretation facilities include guide books, underground tours by ex-miners, and on-site exhibitions.

A shop provides books and leaflets on the industrial heritage of South Wales, and Big Pit in particular. There is also a Big Pit educational folder available. Ample coach and car parking facilities are provided.

Major investment in the repair and upgrading of the site which will include substantial improvement to visitor facilities, up to a value of £6.8 million, is now being planned.

Pontypool and Blaenavon Railway

The Pontypool and Blaenavon Railway Company 1983 Limited runs a service on a limited length of track from near Big Pit to the Whistle Inn. This is the highest altitude standard gauge preserved railway in Wales. The railway operates every Sunday from April to September, with additional specials during May and at Christmas. Tickets are £2 per adult and £1 for children. Family tickets are £5.

During 1998 the railway attracted nearly 5,000 users. The Railway Company is operated entirely by volunteers. They are presently developing a business plan to secure further investment and increase the length of the track. There is ample parking provision for railway users.

The activities of the Railway are publicised through the local press and by leaflets issued at Council Offices and Tourist Information Centres.

Town of Blaenavon

The Blaenavon Workmen's Hall and Institute is used regularly as a cinema and also for concerts and other social events.

A recently completed access and parking study by highway consultants (Gwent Consultancy) has suggested ways in which circulation of traffic and parking arrangements could be improved to encourage visitors.

Nomination Document

The former Council Offices building is being carefully restored for use as a town library. It is intended that the basement will be used as a local heritage centre.

The recently submitted bid made to the Heritage Lottery Fund under the Townscape Heritage Initiative includes proposals for the conservation of St Peter's School which it is intended will become an office and archive for the World Heritage Site.

Relict Landscape

The Blaenavon Industrial Landscape is located within dramatic mountain scenery which attracts many casual visitors, by car, cycling and walking. Much of the site is within the Brecon Beacons National Park which is one of the most popular areas for walking holidays in the United Kingdom. The 'disturbed' industrial landscape offers a contrast with the traditional countryside and natural attractions of other areas within the National Park. There are many field study trips to the area from schools, colleges and universities, and other special interest groups, from the United Kingdom and abroad. The importance of the area for field studies is reflected in the location of several field studies facilities and residential centres within the immediate vicinity.

There are several published books and leaflets for walks in and around the site, including *Walks in Cordell Country* by Chris Barber 1996 (cost £6). The walks make use of old railways, tracks and footpaths in the area. Bloreng Books have also published a history of Llanfoist, an essay by the Rev. Thomas Evan Watkins (1834).

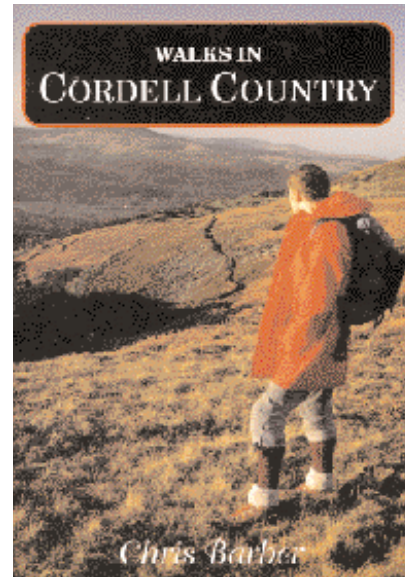
Torfaen County Borough Council have published, with Countryside Council for Wales support, a leaflet describing a three hour circular walk around *Mynydd y Garn Fawr*, within the proposed World Heritage Site boundary. The Council also recently published *Blaenavon Industrial Landscape - a Circular Walk through the Heritage Landscape of Blaenavon*. This walk takes approximately four and a half hours.

A Cordell Country Trail for motorists visiting the Blaenavon Landscape is advertised by leaflets and a supporting exhibition.

There is an informal public parking area beside the Pen-fford-goch feeder pond, known locally as Keeper's Pond, which is well used by walkers and casual visitors. Growth in caving and hang gliding is also a feature of the area. There are several small informal car parks off the Llanover road and the Blaenavon to Govilon road which provide for general viewing and easy access to the main features within the relict landscape.

The Partnership envisage a considerable increase in public use of the site by car, cycle and on foot and are addressing this issue in a commissioned study, to consider the regulation of access by wheeled vehicles and the protection, conservation and interpretation of key features within the landscape.

Part of the Wales National Cycle Route being developed by Sustrans passes through the site from east to west. This is expected to form the springboard for other cycleways within the heritage landscape and to the town of Blaenavon. The National Cycle Network is publicised by way of brochures and the national press.



'Walks in Cordell Country'
by Chris Barber
©Bloreng Books

Brecknock and Abergavenny Canal

In recent years the use of the canal for leisure boating has increased greatly. It is estimated that the section of canal within the nominated site has had an increase of leisure craft traffic of 50% since 1990. The towpath is used increasingly by walkers and cyclists.

General Visitor Facilities

There is a good range of facilities for visitors both within the nominated site and within a few kilometres of the boundary.



Govilon Wharf and warehouse on the Brecknock and Abergavenny Canal. Leisure cruising has increased greatly in recent years

There are catering facilities at Big Pit and proposals are included in the development plan to improve facilities. At the Ironworks there will be a new Tourist Information Centre and ticket office.

There are two cafes, two 'fish and chip' shops, and other take-away food providers in the town. There are also several public houses which serve food in the town and within the industrial landscape area there are three further pubs which serve food: the Whistle Inn off the Brynmawr Road, the Cordell Country Inn on the Govilon/Blaenavon Road and the Lamb and Fox at Pwll-Du, which is frequently used by cavers and hang gliders. There is presently only a limited number of bed and breakfast facilities within the nominated site for overnight visitors but it is anticipated the range and number can be increased in the near future. There is a leisure centre in the town run by Torfaen Leisure comprising of a sports hall, squash courts, weights room and a 25m swimming pool. There is also a lounge

bar and a small cafeteria. There are public toilets in the town which it is intended will be replaced in the medium term. Effective promotion of the area, and investment through various schemes are intended to secure significant improvements in facilities over the next ten years.

Within 25 km of the site there are over 1,000 bed spaces in hotels ranging from modern luxury accommodation to small country house hotels. There is also a good range of bed and breakfast, self-catering and camping accommodation nearby. To the north and east, within the rural areas of the National Park and Monmouthshire, there are several attractive market towns: Brecon, Crickhowell, Abergavenny, Usk and Monmouth. The towns and villages have many attractive hotels, pubs, restaurants, shopping and leisure facilities. To the south and west are the industrial valleys towns including Pontypool, Ebbw Vale and Merthyr Tydfil.

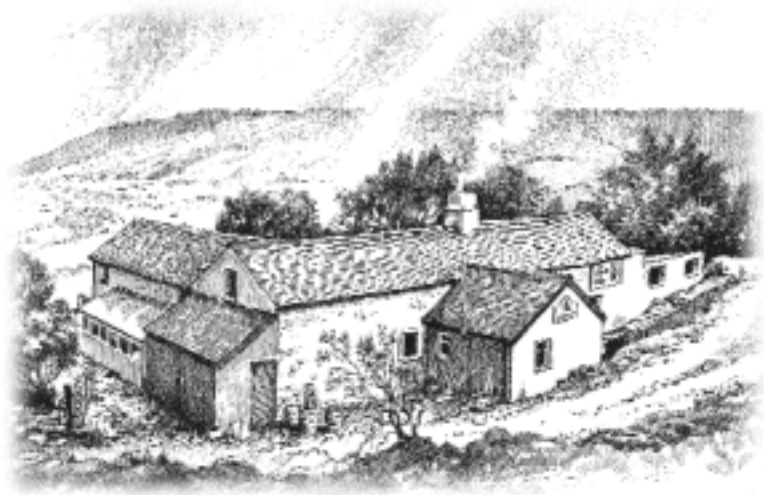
International facilities, including an airport, are available at Cardiff, only 40 km from Blaenavon.

Combined Marketing

In the past, each of the various elements in the Blaenavon Industrial landscape has tended to be promoted independently. The Blaenavon Partnership have agreed that there would be benefits of joint marketing of all the above facilities within the corporate identity of the 'Blaenavon Industrial Landscape'. Such an approach could avoid duplication and encourage visitors to all of the attractions of the area and enable return visits. It is likely that the National Museums & Galleries of Wales through their interest at Big Pit will take the leading role in promotion and marketing.

4(j) *Property Management Plan*

A Management Plan for the potential World Heritage Site has been prepared in accordance with the *Management Guidelines for World Cultural Heritage Sites* by Bernard M Feilden and Jukka Jokilehto. The basis of the Management Plan is fully described at the beginning of this section.



The Management Plan has been submitted in support of this nomination and continues to be developed and refined. As advised in the guidelines, Section 5.2.4, the Plan is in loose leaf form and is subject to continuous review. Refinement and revisions may be made to update the plan while UNESCO is considering this nomination and any significant amendments will be forwarded immediately.

The Management Plan incorporates a variety of phased proposals and projects for Partnership members to implement.

The summary of costs set out in 4(g) shows how the various bodies intend to contribute in different ways to the overall protection, conservation, repair, restoration and interpretation of the Blaenavon Industrial Landscape and how support funding will be sought from appropriate sources to augment Partnership funding. Each organisation approves its own projects within an integrated strategy approved by the Blaenavon Partnership.

4(k) *Staffing Levels*

The various authorities and agencies within the Blaenavon partnership will combine to provide an effective professional, technical and administrative regime.

To date there has been a substantial commitment of staff dedicated to Blaenavon by Torfaen County Borough Council. This has been augmented by staff time provided by the other authorities and agencies in the Blaenavon Partnership as set out in 4(h). The Partnership is determined that sufficient staff and financial resources will continue to be provided to ensure the good stewardship of the Blaenavon Industrial Landscape, in keeping with the site's international significance.

'The Lamb and Fox Inn' is one of the highest public houses in the United Kingdom and once served ale to the people of Pwll-Du village. Drawing by Michael Blackmore, published in 'Portraits of the Past'
©Bloreng Books

5 FACTORS AFFECTING THE SITE

5(a) Development Pressures

The Blaenavon Industrial Landscape covers a large area, 3,290 hectares, containing the town of Blaenavon and other village settlements and individual buildings. It is a living landscape within which consideration must be given to ongoing economic and social change. However, there is no pressure for substantial new development in the area, and all development is carefully controlled by the planning process and statutory procedures.

The main potential pressures affecting the site are:-

- Continuing economic decline in the area
- The use of the heritage landscape for recreational and agricultural purposes
- The presence of residual coal reserves and interest in further coal recovery by opencasting.

Economic Decline

There has been a continuing decline in the population of Blaenavon since the early 1920s. This reflects the irreversible decline in the coal and steel industries. The town has suffered economic and social difficulties with resultant deterioration in the fabric of historic buildings and infrastructure. This matter is being addressed by the local authority and others in the context of a Heritage and Regeneration Study carried out by DTZ/Pieda Consulting, which was commissioned by the Blaenavon Partnership and completed in October 1998. Proposals set out in this study are being developed and refined in the Management Plan. In summary, proposals include:-

- Improvement in the fabric of the town centre. This is being addressed in conservation terms through a bid made to the Heritage Lottery Fund under the Townscape Heritage Initiative to improve key listed buildings in the town. If successful, this will generate about £1m of conservation work in the town centre. Torfaen County Borough Council is also committed to the change in use of the former Town Council Offices to a Town Library and Heritage Centre at a cost of £350,000. This project will commence in June 1999.
- Establishing a Blaenavon Building Preservation Trust. This will be a locally based voluntary organisation. Support funding will be sought from the Architectural Heritage Fund to restore buildings in the town. The Trust has a start up fund of £15,000.
- Traffic Management and Parking proposals. The present traffic management system discourages access to the town by visitors and this has been reviewed in a study completed in April 1999. The study suggests improvements in access and the arrangement and quality of design of town centre parking areas. Expenditure on these measures is likely to total about £120,000 over five years.
- A Housing Renewal Study. This study by Architects Killick, McAdam & Urquhart for the Welsh Office has identified the need to improve the older housing stock through an Area Renewal Programme (Housing Act 1940). A programme of housing area improvement will be implemented over five years valued at £500,000 per annum. The heritage quality of the town will be taken closely into account in implementing this programme. Cadw will advise on details of conservation.

More information on project costs is included in 4(g).

Use of the Relict Landscape

Most of the relict landscape surrounding Blaenavon town is urban common. The public has the right of access to the area for air and exercise on foot, under Section 193 of the Law and Property Act 1925. The commoners have the right to graze stock within specified limits, without disturbance, under the Commons Registration Act 1965.

The commons are unfenced and are accessed from several country roads and tracks, and are crossed by registered footpaths. The resultant pressures upon the landscape are as follows:-

- The old tips are subject to motorbike scrambling, which is illegal and can lead to erosion by exposing the tip material to weathering. Less steep areas are also subject to use by four wheel drive vehicles as an illegal leisure activity.
- Due to absence of fencing, grazing is uncontrolled and over grazing by sheep can prevent the old tips and mine areas being naturally revegetated. Revegetation is the best protection of the disturbed landforms from erosion. However, grazing by sheep has helped prevent the area being entirely overgrown and produced several attractive turf tracks for access through the site.
- There are several identified walks in the area. With increased recognition of the area there will be more access to potentially hazardous areas which will require safety work. Walls and embankments will eventually need to be consolidated/restored. Likewise, access adjacent to the disused limestone quarries, at Pwll-Du for example, will require some work to ensure public safety.

These issues will be addressed in a study commissioned by the Partnership in June 1999 to produce a development plan and management proposals to cater for increased public access to, and interpretation of, the relict industrial landscape. These proposals are intended to develop the suggestions initially outlined in the DTZ Piedad Heritage and Regeneration Study of October 1998.

Residual Coal and Coal Recovery

There has been some continuing interest in recovering residual coal deposits from the area by open-cast coal extraction. However, the areas of land within the nominated site which contain coal reserves are in the ownership of the Walters Group who have given an assurance that they have no intention of extracting coal from within the nominated site boundary.

Notwithstanding this assurance, it is highly improbable that coal extraction would be permitted given the following:

- As recently as 14 January 1993 The Secretary of State for Wales turned down a proposal for opencast coal extraction in the area following a 33 day Public Inquiry.
- There has been a significant growth of interest in, and support for, the industrial heritage of Blaenavon since about 1993.
- Torfaen County Borough Council's Deposit Local Plan, Policy H7, states that development which would prejudice the area's unique heritage will not be permitted.
- Brecon Beacons National Park planning policy is opposed to opencast coal extraction.
- The area was included in the Register of Landscapes of Outstanding Historic Interest in Wales published by Cadw, CCW and ICOMOS UK in January 1998.

- Several sites within the area have been scheduled as ancient monuments of national importance.
- Any application for opencast coal extraction in this area would be likely to be 'called in' for determination by the Secretary of State for Wales.

5(b) *Environmental Pressures*

There are no extreme natural environmental pressures on the Blaenavon Industrial Landscape. The area is exposed mountain top land and is subject to substantial rainfall which creates rapid run off and can cause erosion of tips, embankments and retaining walls.

Considerable work has been carried out, particularly by Dr Philip Putwain of the Environmental Advisory Unit, University of Liverpool, regarding encouragement of natural revegetation. This is referred to in the Management Plan and will be incorporated in a programme of work over several years to encourage effective revegetation of exposed areas, thereby achieving stability and preventing further erosion.

5(c) *Natural Disasters and Preparedness*

This site is not liable to natural disasters.

5(d) *Increase in Visitors*

There are six main features within the Nominated Site which will attract visitors, namely;

- Blaenavon Ironworks
- Big Pit
- Pontypool and Blaenavon Railway
- Town of Blaenavon
- Relict Landscape
- Brecknock & Abergavenny Canal

There is not likely to be any significant problem created by anticipated levels of visitor activity. In considering the capacity of the site to absorb current and likely visitors, the very different characteristics of the four elements listed above require to be taken into account. Conversely, the best hope for the protection and conservation of the area lies in the benefits that can flow from an increase in tourism.

Blaenavon Ironworks

Present visitor levels to the Ironworks are low, 2,445 last year, and the projected increase in visitors to 30,000 per annum in the near future can be readily accommodated given careful controls. Cadw has extensive experience at other sites under its guardianship of dealing with large visitor numbers.

Big Pit

Big Pit Mining Museum is in the process of being taken over by the National Museums & Galleries of Wales, a body with considerable experience in balancing the issues of effective conservation with attracting visitors. NMGW intend to enhance Big Pit as a mining museum of international status and incorporate the experience offered within their overall industrial strategy for Wales.

The Development Plan for Big Pit has recently been completed and this study is founded on principles set out in a detailed Conservation Plan.

The visitor numbers are projected to increase to 120,000 per annum, which is no greater than those achieved in 1992, the year of the National Garden Festival at Ebbw Vale nearby, when visitors were accommodated successfully.

Pontypool and Blaenavon Railway

The railway is capable of accommodating an increase in tourists without detriment to the heritage, bearing in mind the line was used intensively for passenger and freight traffic in the past.

Town of Blaenavon

Given the town's economic decline the problem is not how to accommodate visitors but how to attract them. More visitors would make the town more viable and generate effective uses for many historic town centre buildings in need of repair. The key historic buildings can attract substantial numbers of visitors without detriment to their structural integrity.

Relict Landscape

Present use of the landscape is informal. Most visitors come by car, but there is also use by cyclists and by local residents who enter the area on foot.

The problem of motorcyclists and four wheel drive vehicles using the old tips is addressed in the Management Plan. No other access is likely to pose problems to conservation.

A Study is underway to develop ideas originally contained in the DTZ Pineda Regeneration Study to encourage further access to the relict industrial landscape by car, cycle and walking, all of which are expected to increase substantially. The landscape is capable of absorbing these anticipated increases.

Brecknock and Abergavenny Canal

Much higher levels of use could cause some problems of erosion, but current use is far short of this threshold.

5(e) *Inhabitants within the Property*

The major settlement within the proposed boundary of the nominated site is Blaenavon. The population was 6,066 in the 1991 census and is now estimated to be just below 6,000. Parts of the villages of Llanfoist and Govilon adjoining the Brecknock and Abergavenny Canal fall within the boundary of the nominated site. Approximately 200 other persons live in these areas within the boundary. Within the landscape and outside these main settlements there are various farms, houses and smallholdings accommodating approximately a further 150 persons. An approximate estimate of the total population within the nominated site boundary is 6,500 persons. Clearly this is a site where there is a great variety of uses; residential, commercial, industrial, social, recreational and farming activity. More than 100,000 tourists per annum visit the main attractions of the area and many others visit for study and informal recreation.

6 MONITORING

6(a) Key Indicators for Measuring State of Conservation

The Blaenavon Industrial Landscape comprises very diverse elements. These need to be monitored in a variety of ways. However, the nominated site has been the subject of recent thorough surveys and studies, see 3(c), which can be used as an effective baseline.

The character of the components determine the monitoring regime but individual assessments are organised under five main sub-headings:-

- Blaenavon Ironworks
- Big Pit
- Blaenavon and Cwmavon Conservation Areas & Listed Buildings
- Relict Landscape: including Scheduled Ancient Monuments
- Brecknock and Abergavenny Canal and associated Listed Buildings

Targets will be set through the Management Plan for the proposed World Heritage Site so that the condition of the site and the progress in recording, conservation, and implementation can be effectively measured, for example regarding the completion of repairs and effective interpretation of Scheduled Ancient Monuments.

6(b) Administrative Arrangements

The basis of effective monitoring of the nominated site is in place through the established records and practices of the authorities and agencies of the Blaenavon Partnership, as follows:

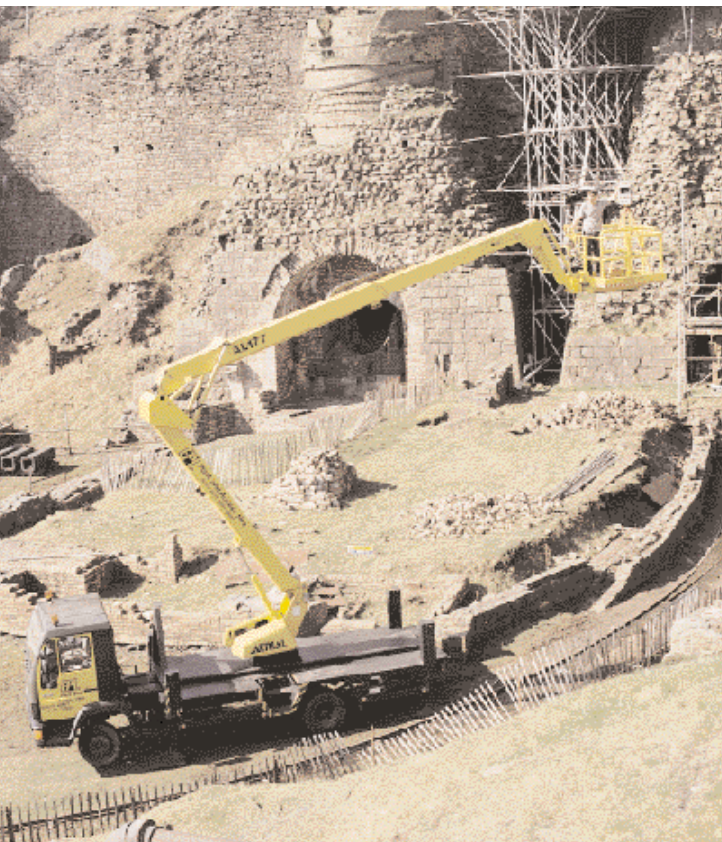
Blaenavon Ironworks

Cadw has excellent photographic and drawn conservation records of the Ironworks. Apart from inspections relating to regular repair and on-site conservation work, Cadw has a system of regular review by suitably qualified Inspectors of Ancient Monuments and conservation architects.

Big Pit

Due to the need to ensure public safety, Big Pit is inspected regularly in respect of the structural conditions of the buildings and the mine.

Big Pit was comprehensively surveyed in 1999 in archaeological and conservation terms with relation to the



recently prepared Development Plan. These studies can be used as a benchmark, and the National Museums & Galleries of Wales as site owners, conservators and record keepers, will put in place an annual inspection system using these surveys as the baseline.

Blaenavon and Cwmavon Conservation Areas & Listed Buildings

The town centre has been thoroughly recorded photographically and descriptively as part of the 1999 Townscape Heritage Initiative Bid. Torfaen County Borough Council will assess the condition of the buildings in the Blaenavon Conservation Area and the Cwmavon Conservation Area annually against an agreed checklist. Particular attention will be paid to Listed Buildings.

Relict Landscape

Cadw has a team of Field Monument Wardens who have responsibility for regularly inspecting Scheduled Ancient Monuments and recording their condition compared with previous inspections. Cadw also commissions regular aerial photography to monitor change.

The historic landscape has been recently mapped by the Royal Commission on the Ancient and Historical Monuments of Wales. This is a comprehensive survey for inclusion in a computerised GIS system and can be used as a baseline of information on the condition and structure of tips and other landscape features.

It is envisaged that a systematic annual inspection of areas of old workings will be carried out by a geotechnical engineer, to check on stability, drainage and other safety matters. The landscape will also be inspected regularly by Torfaen County Borough Council's Countryside Warden Service and the Brecon Beacons National Park Warden Service. The four Sites of Special Scientific Interest within the nominated site are monitored regularly by the Countryside Council for Wales.



RCAHMMW use up-to-date computer technology including Geographical Information Systems (GIS) to maintain records of the Blaenavon Industrial Landscape
© Crown Copyright: RCAHMMW

The Brecknock and Abergavenny Canal

British Waterways are responsible for the Brecknock and Abergavenny Canal and in the context of their Management Plan will annually inspect the canal for structural integrity. British Waterways have agreed that a bi-annual inspection of the length of canal within the nominated site will be carried out by an appointed industrial archaeologist to check that the historic qualities of the canal and associated structures are not being prejudiced by increased use.

6(c) *Previous Records*

As stated in 3(c), the Royal Commission on the Ancient and Historical Monuments of Wales, Cadw, the Countryside Council for Wales and Big Pit Museum Trust have all maintained extensive and detailed records of the different parts of the heritage resource over a number of years. These are available to enable comparisons to be made with future surveys.

Torfaen County Borough Council has plans, photographs, and other records of the key buildings in Blaenavon against which the effectiveness of conservation can be measured. The basis for future management is therefore in good order.

Blaenavon Industrial Landscape



Son et lumière at Blaenavon Ironworks
©Cadw

7 DOCUMENTATION

Section 7(a) and 7(b) list the documents, photographs, plans etc. which have been submitted in support of this Nomination Document. A bibliography of further literature concerned with the site is given in 7(c).

7(a) Photographs, Slides etc.

	<i>Ref. No.</i>
• CD presentation	BIL/P/1
• Aerial photographs by RCHAMW taken April 1999 Set of A4 colour photographs of nomination site	BIL/P/2
• Feature photographs by Cadw and RCHAMW showing main features of nomination site	BIL/P/3
• Set of colour slides: aerial views 35mm	BIL/P/4
• Set of colour slides showing key features 35mm	BIL/P/5

7(b)i Copies of Property Management Plans, etc

• Blaenavon Industrial Landscape, proposed World Heritage Site: Management Plan	BIL/MP/1
• Big Pit Mining Museum Development Plan, Executive Summary June 1999 for submission by National Museums & Galleries of Wales to Heritage Lottery Fund	BIL/MP/2
• Blaenavon Ironworks Outline Proposals, June 1999	BIL/MP/3
• Blaenavon Town: Submission to Heritage Lottery Fund: Townscape Heritage Initiative May 1999	BIL/MP/4
• St Peter's Church Heritage Lottery Fund Application, November 1997 (approved September 1998)	BIL/MP/5
• Heritage and Regeneration Study by DTZ Piedad for Blaenavon Partnership October 1998	BIL/MP/6

7(b)ii Development Plans

• <i>Gwent County Structure Plan</i> , approved 1996	BIL/DP/1
• <i>Torfaen Deposit Local Plan</i> and amendments	BIL/DP/2
• <i>Monmouthshire Wide Local Plan</i>	BIL/DP/3
• <i>Brecon Beacons National Park Plan 1993-1998</i>	BIL/DP/4

7(b)iii Other Supporting Documents

• Map showing proposed World Heritage Site boundary, Scale 1:25000	BIL/SD/1
• Map showing Scheduled Ancient Monuments and Listed Buildings, Scale 1:25000	BIL/SD/2
• Scheduled Ancient Monuments of national importance within nomination site	BIL/SD/3
• Listed Buildings of architectural or historic merit within nomination site	BIL/SD/4
• Sites of Special Scientific Interest within nomination site	BIL/SD/5

Blaenavon Industrial Landscape

- Map of Blaenavon Conservation Area and leaflet BIL/SD/6
- Map of Cwmavon Conservation Area and leaflet BIL/SD/7
- Extract (Blaenavon) from *Register of Landscapes of Outstanding Historic Interest in Wales* by Cadw, CCW and ICOMOS UK published January 1998 BIL/SD/8
- Names and addresses of major landowners BIL/SD/9

7(b)iv Recent Papers/ Studies

- *Blaenavon Town : An overview of its Growth and Development* by J A H Evans, for Torfaen County Borough Council 1999 BIL/RP/1
- *Cwmavon/Varteg Forge: An Archaeological Assessment* by J A H Evans, for Torfaen County Borough Council 1999 BIL/RP/2
- Hill Pits, Blaenavon by John Van Laun, *Industrial Archaeology Review*, 1979 BIL/RP/3
- Proposals for opening Pwll-Du Tunnel, Pwll-Du Research and Exploration Group BIL/RP/4
- *Pwll-Du, Gwent: An Archaeological Desk Top Assessment by the Ironbridge Gorge Museum Archaeological Unit, for Gwent County Council, January 1994* BIL/RP/5
- *The Quarries, Tramroads and Railway of the Blorenge and Gilwern Hill: A brief outline* by John van Laun Associates Industrial Archaeologists 1998 BIL/RP/6
- Trial Air Photo Mapping, Merthyr & Blaenavon (Pen-fford-Goch) RCHAMW 1998 BIL/RP/7
- *Water Supply to Garn-Ddyrys Forge* by Paul J Wellington 1999 BIL/RP/8

7 (b)v Publicity Documents

- Big Pit education pack BIL/PD/1
- Big Pit information booklet BIL/PD/2
- Big Pit publicity leaflet BIL/PD/3
- *Blaenavon Circular Walk: Mynydd y Garn-fawr* leaflet, by Torfaen County Borough Council 1998 BIL/PD/4
- *Blaenavon Industrial Landscape: Circular Walk* leaflet, by Torfaen County Borough Council 1999 BIL/PD/5
- *Blaenavon Inheritor*, Edition 1, Torfaen County Borough Council 1999 BIL/PD/6
- *Blaenavon Ironworks*, Cadw guidebook 1992 BIL/PD/7
- *Blaenavon Ironworks*, Cadw publicity leaflet 1998 BIL/PD/8
- Brecon Beacons National Park leaflet 1996 BIL/PD/9
- *Hanes Llanfoist*, leaflet published by Blorenge Books 1996 BIL/PD/10
- *Travel by Train*, leaflet published by Pontypool & Blaenavon Railway 1999 BIL/PD/11
- *Walks in Cordell Country* by Chris Barber, Blorenge Books 1996 BIL/PD/12

7(c) *Select Bibliography*

Archive Sources

The principal manuscript sources relating to Blaenavon are located in the Marquess of Abergavenny's Collection and the Daniel Doncaster Collection in the Gwent Record Office, Cwmbran. The Abergavenny and District Steam Railway Society archaeological investigation records of Garn-Ddyrys Forge are held at National Museum and Galleries of Wales, Cardiff. Archaeological archives are held by Cadw and the National Monuments Record of RCAHMW.

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7(d) *Addresses for Inventory and Property Records*

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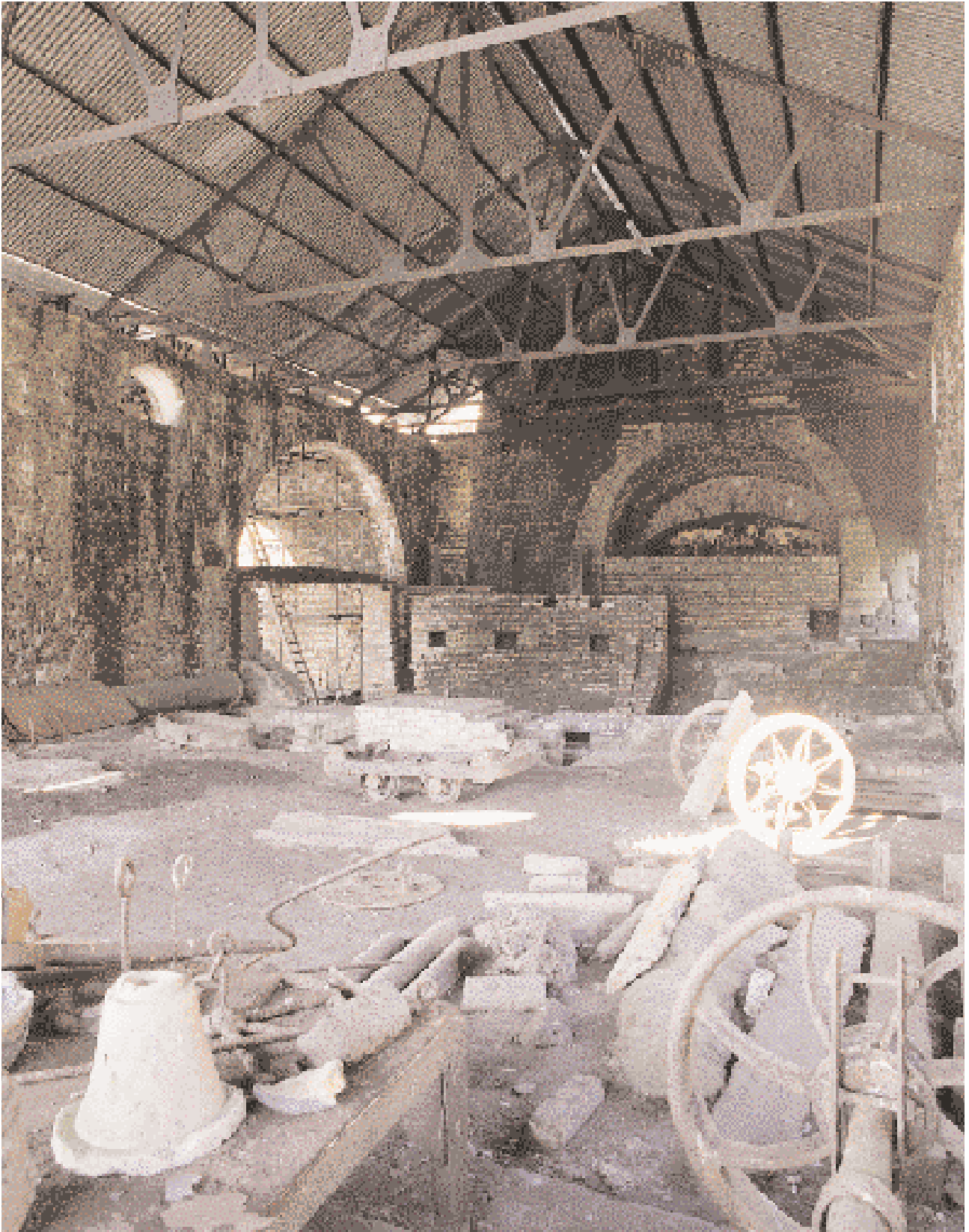
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*Blaenavon Ironworks, view of Furnace No 2
from interior of cast house
©Cadw*

8. SIGNATURE

Signed (on behalf of State Party)

Full name

Title

Date



Blaenavon Industrial Landscape