



Environment Protection and Biodiversity Conservation Act 1999

INCLUSION OF A PLACE IN THE NATIONAL HERITAGE LIST

CITY OF BROKEN HILL

I, Greg Hunt, Minister for the Environment, having considered in relation to the place described in the Schedule of this instrument:

- (a) the Australian Heritage Council's assessment whether the place meets any of the National Heritage criteria; and
- (b) the comments given to the Council under sections 324JG and 324JH of the *Environment Protection and Biodiversity Conservation Act 1999*; and

being satisfied that the place described in the Schedule has the National Heritage values specified in the Schedule, pursuant to section 324JJ of the *Environment Protection and Biodiversity Conservation Act 1999*, include the place and its National Heritage values in the National Heritage List.

Dated 22/12/2014

[signed by]
Greg Hunt
Minister for the Environment

SCHEDULE

STATE / TERRITORY

Local Government

Name

Location / Boundary

Criteria / Values

NEW SOUTH WALES

Broken Hill City

City of Broken Hill:

About 16770ha, Silver City Highway and Barrier Highway, Broken Hill, comprising the whole of the Broken Hill City Council Local Government Area.

Criterion	Values
(a) the place has outstanding heritage value to the nation because of the place's importance in the course, or pattern, of Australia's natural or cultural history.	<p>The City of Broken Hill contains one of the world's largest deposits of silver/lead/zinc ore bodies. Discovered by Charles Rasp, boundary rider and prospector, Broken Hill continues to be mined today, over 125 years since its discovery in 1883.</p> <p>The City of Broken Hill is an exciting geological area of national and international renown. It provides a window into 2,300 million years of Earth's history and has recorded the landscapes and geological environments which have evolved in response to eons of geo-chronologic changes.</p> <p>In the field of mineralogy the Broken Hill deposit has achieved its widest international recognition as one of the world's great "mineralogical rainforests" with approximately 300 mineral species reliably confirmed from the ore body. The Broken Hill ore body is geologically complex, however characteristic environments where minerals exist include the outcropping gossan (the weathered, ragged black outcrop) and the secondary zone. The gossan from the main Line of Lode has national significance for its immense size, and enormous suite of minerals.</p> <p>The Broken Hill mines have played a decisive role in Australia's mining history and Australia's national development. The wealth and expertise generated by mining at Broken Hill over such a long period has contributed markedly to Australia becoming well known as one of the world's major providers of raw materials. Broken Hill played a decisive role in the origin and growth of some of the world's largest and wealthiest companies, Broken Hill Proprietary Company Limited (now BHP Billiton), Rio Tinto and Pasminco Ltd. Broken Hill is one of Australia's longest lasting mining fields compared with the average life of a mine of some 20 years. The continuous nature of large scale mining over so many years (125) is unique in the Australian context, a record not matched by other mining areas.</p> <p>The Line of Lode proved to be one of the largest silver, lead and zinc mineral deposits in the world. The on-going exploration of the Line of Lode from 1883 provided the basis for the commercial prosperity of the Broken Hill township and the mines that exploited the ore. The continuation of mining activity in Broken Hill is important for the</p>

(a) (cont)

economic prosperity of the city and contributes to its national significance. The significance of the mining industry to Broken Hill and the nation is represented by the ongoing mining operations, the barren topographical profile, scale and landform of the mullock heaps along the Line of Lode, the Line of Lode itself and the extensive mining leases.

Broken Hill has contributed several world ranking innovative mining and metallurgical practices which were to benefit later lead and zinc mines. In particular, the development and application of the froth flotation processes and the computer controlled on-stream analysis of slurries using radio isotope probes are of world renown. Two generations of professional and technical staff and experienced miners who were trained at Broken Hill subsequently went on to develop other ore bodies in Australia and overseas. The Broken Hill experience generated expertise which spread into many metalliferous and coal mining, engineering, chemical and manufacturing industries, notably steel and its associated industries. The significance of innovative mining practices is demonstrated by the relict mining infrastructure.

Broken Hill is significant as the place where safe working practices legislation and occupational health and safety provisions for workers, particularly miners was developed. Broken Hill has been described as the 'bastion of unionism' and was the site of the two longest miners' strikes (1909 and 1919-20) in Australia's industrial history. The 1919-20 strike of over 600 days resulted in significant gains for the miners: the 35 hour week, and improved underground health and safe working conditions. Some of these gains eventually flowed to other workers throughout Australia. Evidence of the strength of the union movement in Broken Hill is represented by the Barrier Industrial Council, the Trades Hall and the Amalgamated Miners Association Hall, archives held in the Broken Hill City Library and the Barrier Industrial Council's collection of movable cultural heritage, together with the records of the *Barrier Daily Truth*.

Legislation aimed to protect the community from lead poisoning. However, it was left to the mining companies such as the Sulphide Corporation and the Zinc Corporation rather than the law to implement social welfare programs such as the provision of recreational amenities. Housing demand generated by increased mining activity and the sudden growth of population in the late 19th and early 20th century gave rise to strong support for privately organised co-operative workers housing schemes. In addition, mining companies provided low interest loans for employee housing as well as establishing housing co-operatives and constructing housing for senior staff. Community amenities and housing need is represented by recreational facilities provided by the Zinc Corporation and mine workers' housing schemes.

(a) (cont)

Other measures aimed at improving the amenity of the Broken Hill community came from the work undertaken by Albert Morris and applied by the Zinc Corporation. As a private individual, and with mining company support, he experimented by fencing and planting areas with native species and showed how regeneration of the denuded landscape could combat the impact of devastating dust storms. This far-sighted innovative regeneration work by Morris from 1936 led the Zinc Corporation to apply regeneration practices at Broken Hill. Subsequently the precedent was used by mining companies and spread throughout Australia, particularly in arid zones.

Albert Morris pioneered research into the propagation and planting of native and exotic species that would grow in arid and semi arid locations. He promoted ideas for 'green belts' in Broken Hill. Regeneration schemes, planted to protect Broken Hill from major dust storms, now partially surround the City and continue the intent of the program to revegetate the surrounding landscape degraded through removal of vegetation cover for mining operations and heavy grazing. The significance of Morris' work is demonstrated by the plantations, the creation of popular recreational facilities and the extensive regeneration areas surrounding Broken Hill.

An adequate water supply for Broken Hill, a constant concern from the 1880s onwards for both the population and for mining functions, was dogged by official dilatoriness. Initially water was provided from soakage sites, then carted in to Broken Hill on the Silverton Tramway as well as being piped from Government dams, and provided separately by private enterprises. A Government funded 99km pipeline from Menindee (1952) provides a water supply which permits an enhanced level of civic amenity and parkland irrigation, as well as providing for ongoing mining operations.

The remoteness of Broken Hill posed significant difficulties for transporting ore and concentrates to sea ports. In 1886, to overcome the impasse between the railway interests of NSW and South Australia, the mining companies, using the Victorian Companies Act, established the Silverton Tramway Company Ltd. This narrow gauge track, via Silverton (NSW) and Cockburn (SA) focussed Broken Hill exports on the South Australian town of Port Pirie and drew the community of Broken Hill into the Adelaide and South Australian sphere of influence. In 1927 NSW eventually connected its standard gauge rail network to Broken Hill providing links to Newcastle and the steel works in that city. In 1970 the east-west railway corridor was completed establishing a standard gauge connection from Sydney to Perth, with a major stop at Broken Hill. The Silverton Tramway Company is represented by the Broken Hill Railway Museum and its collection in Sulphide Street and the standard gauge east-west link is represented by the Broken Hill railway station in Crystal Street and adjacent railway infrastructure. The very remoteness of Broken Hill was the reason for its use during WW II as the site to store Australia's gold bullion reserves.

- (a) (cont) Elements which embody events and processes include the complex geology and mineral deposits, ongoing mining operations and their ever-changing nature, adaptive re-use of mining facilities, relict mining infrastructure, the Line of Lode and remaining gossan outcrops, and mining leases, the city layout within the planned urban grid and tree lined streets, the residential character, mining company housing and the revegetation areas.
- (b) the place has outstanding heritage value to the nation because of the place's possession of uncommon, rare or endangered aspects of Australia's natural or cultural history.
- Broken Hill is unique amongst Australian geological deposits for its mineralogical diversity. Broken Hill is the type locality for 19 mineral species, including many rare and uncommon species. The secondary zone of the Broken Hill ore body contains an extensive array of extremely rare well-crystallised minerals, and unrecorded species continue to be found. The rarity of Broken Hill's mineralogy is demonstrated by its mineral deposits and the records of the mining companies.
- Broken Hill is a rare example of a long established, almost continuously operated mining town, with a long industrial history and strong union representation. The industrial actions of unions focussed on protecting jobs, improving community amenity and achieving safe and healthy conditions for workers within the mining industry and for workers generally is at a level of intensity unmatched elsewhere in Australia. Broken Hill is also unusual for the way that the Barrier Industrial Council emerged as a social, regulatory and economic force bringing together a range of craft based unions and able to dictate who worked in Broken Hill by: ensuring preferential employment for the locally born; supporting the provision of particular services; and controlling the extent of retail competition. The Barrier Industrial Council policy of not permitting married women to work in Broken Hill survived until a legal challenge forced a change. The rarity of Broken Hill as a town with its strong union presence is represented by the continuing operation of the Barrier Industrial Council, occupational health and safety legislation and safe working practices. The union movement in Broken Hill is also represented by its association with and ownership of the *Barrier Daily Truth*. Significant fabric representing the past role and ongoing activities of the union movement includes the Trades Hall, the former Broken Hill Council Chambers and the Amalgamated Miners Association Hall.
- Broken Hill is a rare example of Australia's complex federal system. Located in the far west of the state, NSW and the Broken Hill City Council provide water and sewer infrastructure and a representative from Broken Hill sits in the NSW Parliament. However, Broken Hill is serviced by rail primarily from South Australia, keeps Central Australian time and Adelaide is its nearest capital city. In the late 19th and early 20th centuries financial interests for Broken Hill mining companies were managed from Melbourne in Victoria, and London provided investment capital. This unusual mix is reflected in the architecture of Broken Hill buildings, where official buildings have recognisable NSW Government Architect characteristics, the residential buildings exhibit design and construction characteristics derived from South Australia, and commercial buildings, such as hotels, show characteristics from Melbourne's late Victorian architectural period.

(b) (cont) The example of Broken Hill as an isolated community is emphasised by the unusual measure of transferring gold bullion from coastal capitals during World War II. Its remoteness from sites of possible invasion by the Japanese was seen as a distinct advantage. Australia's gold reserves were stored in Broken Hill from 1942 until 1945 and this transfer was the largest single transfer of gold ever carried out in Australia.

Broken Hill is a rare example of a mining town where 'green belt' regeneration measures were researched, tested and implemented. From the 1930s onwards with the assistance of mining companies, the revegetation of denuded areas adjacent to its urban areas was trialled and shown effective in reducing the adverse effect on dust storms. Albert Morris tested native and exotic species for their capacity to survive arid and semi arid conditions.

(c) the place has outstanding heritage value to the nation because of the place's potential to yield information that will contribute to an understanding of Australia's natural or cultural history.

Broken Hill has important research potential for further investigation into its innovative mining practices, its mineralogy and geology, its history of unionism and development of safe mining practices, and its social characteristics.

A large collection of mining records and associated material is available to provide information on the methods of construction and the economic reasons for developing and mining along the Line of Lode. This collection has the potential to contribute further to the technical advancement of mining. Mining company records provide research potential into the history and discovery of innovative processes such as the froth flotation. The wide range of relict mining infrastructure on and in the vicinity of the Line of Lode, and the extensive documentary records make the place an important source of information on the development of mining practices, processes, technological advancement, and working conditions. The mining companies are custodians of considerable records of mining operations.

Mining and research on the Broken Hill ore body spans an exceptional 120 years, and previously unrecorded mineral species continue to be discovered. Scientific research continues to generate important outcomes including new concepts in ore genesis. Research on the diverse and complex geology of Broken Hill contributes to an understanding of the formation of the Australian continent and more than 2300 million years of the Earth's history.

Systematic corporate collecting of unique specimens in the last two decades at Broken Hill has resulted in a valuable repository of, and resource for investigation into, Australia's mineralogical heritage. The Line of Lode is significant for the scientific research potential of the numbers and types of rare minerals found associated with the mineral ore body. Opportunities exist for further research into methods for the efficient extraction of minerals and processes for the treatment of ore bodies.

The research values of Broken Hill are represented by mining company and union records.

- (d) the place has outstanding heritage value to the nation because of the place's importance in demonstrating the principal characteristics of:
(i) a class of Australia's natural or cultural places; or
(ii) a class of Australia's natural or cultural environments.

Broken Hill demonstrates the principal characteristics of an evolving mining town. With populations ranging from its early beginnings to approximately 35,000 in 1915, to its current population of approximately 20,000 it represents a typical example of mining town growth and contraction, depending on economic circumstances, metal prices, supply and demand, and competition.

In 1886, within three years of the discovery of the ore bodies, Broken Hill had been surveyed and a town plan gazetted, adapting the rectilinear town planning grid pattern regulations promulgated by Governor Darling in 1829 for the layout of rural townships. The Broken Hill town plan flanks the Line of Lode and generally parallels the mining leases. Broken Hill municipality was incorporated in 1888 and it was proclaimed a city in 1907. The urban plan of Broken Hill is represented by the wide streets, some doubling as drainage channels to cater for the run off from sudden storms, and the rectilinear grid street pattern.

The principal characteristics also include changes to the geo-chronological environment; relict mining infrastructure and the ever-changing nature of the results of mining activity as mining processes change; the patterns of mining leases aligned to the Line of Lode ore body; an administrative and commercial service centre historically based on the mining industry but diversified to service extensive pastoral interests; provision of residential accommodation in proximity to work locations; and despite its remoteness, extensive road, rail and air transportation links to Sydney, Adelaide and Melbourne. The grid pattern town layout has shown itself to be robust and flexible, standing the test of time and responding to social and technological change over 124 years.

The characteristics that represent a mining town are also represented by continuing mining operations and their ever-changing nature, the remaining gossan outcrops of the Line of Lode, its relict mining infrastructure, all modes of road and rail transport infrastructure and its role as a centre for the Royal Flying Doctor Service.

Although the Broken Hill ore body is geologically complex, it also contains characteristic environments where minerals occur in the outcropping gossan (the weathered, ragged black outcrop of the ore body-the 'Broken Hill').

- (e) the place has outstanding heritage value to the nation because of the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group.

The distinctive aesthetic qualities of the Broken Hill include the mining landscape and the remaining bulk and scale of the Line of Lode with its relict mining infrastructure dominating and in such close proximity to the surrounding townscape, all set in a vast arid landscape. This visual representation of mining activity on the surface and the barren character of the remaining mullock dumps identifies the physical location of the Line of Lode and the below surface mining of the layered mineral deposits.

Broken Hill is a visually cohesive town with late Victorian and Federation era administrative and commercial buildings reflecting the mining wealth, and an unusually uniform and singular scale of residential housing with pockets of 'tin' architecture. The aesthetic urban qualities contrast with the surrounding belts of revegetated countryside, all set in an arid desert landscape in which the vivid colours, brilliant light and vast horizons stretch well beyond the city. The contrast between the built up area and the dominating arid desert landscape is heightened by the sharp, orthogonally distinctive abrupt urban edge.

Broken Hill is a popular centre for artists, poets, film-makers and TV producers and is recognised as a major focus for artistic endeavour. The 'Brushmen of the Bush' is a group of Australian artists located in Broken Hill who popularised paintings of outback Australia. Several major Australian artists with works included in Australian and overseas galleries and private collections are associated with depicting the enthrallingly stark Broken Hill environment. Australian film makers have used Broken Hill and its landscape setting for major and popular works. Through their paintings, poetry, films and TV productions these artists and producers with their nationally recognised reputations demonstrate the strength of their understanding and appreciation of the aesthetic characteristics of Broken Hill and its desert setting.

The aesthetic significance of Broken Hill is demonstrated by: the dramatic and spectacular but ever-changing landscape form and the still massive scale of the barren mullock dumps along the Line of Lode so close to the central business area of the city; the design qualities of the streetscapes; the distinctive character of existing and relict mining infrastructure; and the unusual visual qualities of 'tin' residential and mining architecture. Other features representing the aesthetic significance are the contrast between the scale of the mullock dumps and the central business townscape, both dwarfed by the grander scale of the vast outback landscape setting; the views to and from the Line of Lode along streets and from distant hills; together with close and distant views of mining markers, such as headframes, and mining industry relics. All these factors combined offer evocative and tangible evidence of Broken Hill's industrial character contrasting with its remote landscape setting. Other aesthetic features include historic nineteenth and twentieth century buildings and precincts and the park vistas and streetscapes with memorials and artwork.

- (f) the place has outstanding heritage value to the nation because of the place's importance in demonstrating a high degree of creative or technical achievement at a particular period.

Over many years Broken Hill has been the source of much of the world's knowledge on the extraction of minerals and the application of scientific method to separate minerals from the base ore. The advancement and improvement of mining practices, innovative experimentation in design of industrial plant and buildings, as well as the discovery of new methods of treating difficult ores and the introduction to Australia of overseas practices includes: the use of square set timbering to overcome the problem of unstable ground; the introduction of the froth flotation process for separating mineral ores for the recovery of zinc concentrates from tailings dumps; the selective separation of lead and zinc from refined ore, the selective separation of lead and zinc from the ore as mined; the roasting of slimes to assist in de-sulphurising the slimes; the re-utilisation of slimes through a 'sand plant' whereby slimes were used for backfilling stopes instead of mullock; and pioneering use of rising (slip) form for reinforced concrete; and pioneering the computer controlled on-stream analysis of slurries using radio isotope probes.

Broken Hill research and development expertise spread into major metalliferous and coal mining, engineering, chemical and manufacturing industries, notably the steel industry, lead smelting and the electrolytic zinc smelting process. These technological advances also had application for refractories, and for other industrial processes such as timber milling, the production of paper, the manufacture of fertilisers, and cement, as well as for shipping and aircraft. Continuing technological development of mining practices and processes have the potential to enhance the technical achievement values of the place.

The work of Albert Morris, eventually supported by mine management, in researching, validating and subsequently implementing regeneration measures to protect both the residential and mining areas from devastating dust storms is a major technical achievement. His work, recognised nationally and internationally, is evident in the 'green belt' surrounding Broken Hill. Regeneration areas, following the principles established by Morris, now provide an edge to Broken Hill urban areas, particularly on the north-western and south-western boundaries.

The record of technical achievement is represented by the mining records of mining companies and other academic and community archives. It is also represented by relevant relict mining structures that demonstrate the advancement of technological practices that were invented, applied and/or pioneered at Broken Hill.

- (g) the place has outstanding heritage value to the nation because of the place's strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.
- The City of Broken Hill is valued for its strong community spirit, self reliance and for exhibiting the resilience of a remote inland community. For the Australian community Broken Hill symbolises the importance of the Broken Hill mines to the wealth of Australia. Broken Hill also symbolises the challenges and remoteness of the outback, which is a defining element for the community.
- The steep, barren and dominating mullock heaps, tailings, skimps and slagheap along the Line of Lode and the remnant outcrops of the Line of Lode gossan are highly valued by the community as the industrial and economic heart of the city, and as the reason for Broken Hill's existence. The combination of the dramatic mining infrastructure set in the arid desert plain and undulating landscape of the region is found in visual images, paintings, photographs and films. This imagery is highly valued by the local Broken Hill community and widely recognised by the wider Australian community.
- There is a deep, enduring and shared link between the existing community, past residents and the 'city in the desert'. This strength, depth and long-held connection between the community and the place Broken Hill and its outback landscape is made tangible by: its remoteness; the design and landscaping of the town with its 'oasis' like character and regeneration areas; an appreciation of the distinctive residential 'tin' architecture recalling the harsh living conditions; and the murals, public art and memorials located throughout the urban area.
- The social value of Broken Hill is represented by pride in being a Broken Hill resident; the continuous and ongoing mining operations; the adaptation of mining facilities for re-activated or new mining operations; and the resilience of the community to adapt to change and deal with its remoteness in times of adversity. These qualities are represented by the mullock heaps along the Line of Lode, the remaining gossan outcrops of the Line of Lode, the Line of Lode itself; relict mining infrastructure; the extensive arid landscape setting; and the civic amenity and community facilities provided through Broken Hill's planned urban land uses.
- (h) the place has outstanding heritage value to the nation because of the place's special association with the life or works of a person, or group of persons, of importance in Australia's natural or cultural history.
- The City of Broken Hill is important for its associations with many individuals who have played a prominent role in the Australian mining industry. Significant people include the lode's discoverer, Charles Rasp; engineer and metallurgist GD Delprat; the American mining engineer Herbert Hoover; Australian industrialists WL Baillieu, WS Robinson and MAE Mawby, union organisers Percy Brookfield and Eugene O'Neill and environmentalist Albert Morris. As a group, the Barrier Industrial Council is also important for its association with Broken Hill.
- The significance of important people and groups is represented by their association with mining the Line of Lode, ongoing mining operations, relict mining infrastructure, mining leases, local government and mining records, Barrier Industrial Council records, regeneration areas and Broken Hill City Council records.

For more information on the place search the Australian Heritage Database at <http://www.environment.gov.au/cgi-bin/ahdb/search.pl> using the name of the place.