



THE GOLDEN PIPELINE
A NATIONAL TRUST PROJECT

BUILDING THE GOLDFIELDS WATER SUPPLY SCHEME



Building the weir wall 1900



BL 816Bc6844 Pipe-laying across Darling Range c.1900

BL 001284D

The Goldfields Water Supply Scheme was designed and built under the supervision of CY O'Connor between 1898 and 1903 to pump fresh water from the Darling Range near Perth 560 km east to the arid Goldfields. The scheme was designed with eight separate sections to overcome the difficulty of pumping water uphill over such a great distance. A dam, the pipeline and eight pump stations were the main components of the scheme.

FACTS AND FIGURES OF THE ORIGINAL SCHEME

| | |
|-------------------------------------|--|
| <i>Cost of scheme</i> | <i>£2 655 220 (\$5 310 440)</i> |
| <i>Number of pipes</i> | <i>60 000</i> |
| <i>Amount of water pumped daily</i> | <i>Up to 5.6 million gallons (25.5 million kilolitres)</i> |

MUNDARING WEIR

A dam, known as Mundaring Weir, was built on the Helena River to store water to be pumped to the Goldfields. O'Connor's assistant,

TC Hodgson considered 17 sites before choosing this one. In 1898, during the excavation of the weir foundations, a huge boulder was unexpectedly revealed. When it was removed a deep fault in the bedrock was found. Overcoming these problems delayed construction for one year. The concrete wall was completed in June 1902. A construction camp on the site was home to around 300 workers and their families during the building of the weir.

PIPELINE

The pipes were made of steel plates imported flat from Germany and America. Two steel plates were bent to form semi-circles and joined using the innovative locking bar system invented by Mephan Ferguson. The locking bar replaced the practice of riveting the plates together. This new system minimized the risk of leakage as no holes were drilled into the pipes and it also reduced internal friction as there were no rivet heads to slow the flow of water inside the pipes.

Where possible the pipeline was built alongside the route of the existing railway line to enable the pipes to be easily transported. The length of the train carriages determined the length of the pipes (28 feet or 8.5 metres). The pipes were laid in trenches to reduce contraction and expansion caused by temperature extremes. Lengths of pipe were joined as they were laid using a process that packed the joint with lead, known as caulking. Over 60 000 joints were required and this process was done by hand until a caulking machine that produced consistent joints and saved time and labour was invented by James Couston in 1901.

PUMP STATIONS

Eight pump stations were built along the length of the pipeline. The water had to be pushed up and over the height of the Darling Range and then to the Goldfields - a total lift of 340 m and a distance of 560 km. No 1 Pump Station drew water directly from Mundaring Weir and No 3 used an existing railway dam. The other six stations had a large



Mt Charlotte opening, 1901

BL 000862D

concrete receiving/suction tank to hold water which flowed from the previous pump station and from which water was then pumped to the next.

APPROXIMATE DISTANCES FROM NO 1 PUMP STATION

| | | |
|-------|-----------------------|--------|
| No 1. | <i>Mundaring Weir</i> | |
| No 2. | <i>O'Connor</i> | 2 km |
| No 3. | <i>Cunderdin</i> | 120 km |
| No 4. | <i>Merredin</i> | 220 km |
| No 5. | <i>Yerbillon</i> | 270 km |
| No 6. | <i>Ghooli</i> | 345 km |
| No 7. | <i>Gilgai</i> | 395 km |
| No 8. | <i>Dedari</i> | 465 km |

DEVELOPMENT OF THE SCHEME SINCE 1903

The pipeline has been upgraded and the scheme extended since it was first built. The pipes were reconditioned or replaced during the 1930s and 40s to overcome corrosion problems. They were lined with concrete, placed above ground and the lead-packed joints were replaced with welded joints. Several sections of the pipe - totaling 64 km - were temporarily replaced with wood-stave pipes made of karri, which were used for 30 years.

The original Goldfields Water Supply Scheme became the basis

of the northern section of the Comprehensive Water Supply Scheme, completed in 1973. This post-war scheme promoted the expansion of agricultural areas by providing water for stock and domestic purposes. As part of this scheme the storage capacity of Mundaring Weir was trebled when the weir wall was raised 10 m in 1951. Sections of the main pipeline were enlarged and branch mains were extended north and south. Between 1954 and 1969 the first seven original pump stations were replaced by electric pump stations. No 8 Pump Station at Dedari was replaced by a diesel station in 1970 and converted to electric power in 1984.

THE SCHEME TODAY

Now known as the Goldfields and Agricultural Areas Water Supply Scheme, it supplies water for domestic, stock and mining purposes to 33 000 rural and town services through 8 000 km of pipe mains.

Today water takes 5-11 days to reach Kalgoorlie. An average of 90 million litres of water is pumped daily. The pipe network holds 300 million litres of water.

FOR FURTHER INFORMATION GO TO

GOLDEN PIPELINE WEBSITE:
www.goldenpipeline.com.au
 WATER CORPORATION WEBSITE:
www.watercorporation.com.au

READ

National Trust, *The Golden Pipeline Heritage Trail Guide*, 2002

J Lefroy, D Frylinck and M Duke, *The Pipeline CY O'Connor Built*. Fremantle Arts Centre Press, Western Australia, 2003

VISIT

No 1 Pump Station,
 Mundaring Weir,
 Golden Pipeline Heritage Trail

The National Trust promotes the value of heritage and uses its heritage assets to build a better future for Western Australia. The National Trust seeks to encourage and educate the community about the appreciation, enjoyment and use of its unique cultural and natural heritage, and to provide long-term social, economic and environmental benefit to all Western Australians.

FOR MORE INFORMATION REGARDING MEMBERSHIP AND VOLUNTEERING CONTACT:

The National Trust of Australia (Western Australia)

Old Observatory
 PO Box 1162
 Western Australia 6872
 Telephone 08 9321 6088
 Facsimile 08 9324 1571
 Email trust@ntwa.com.au
 Website www.ntwa.com.au