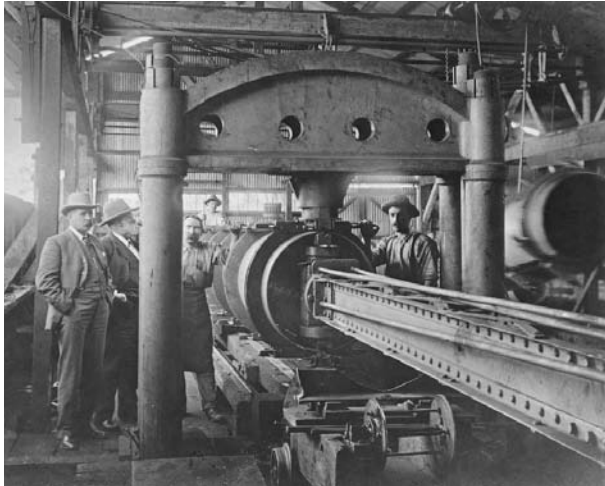


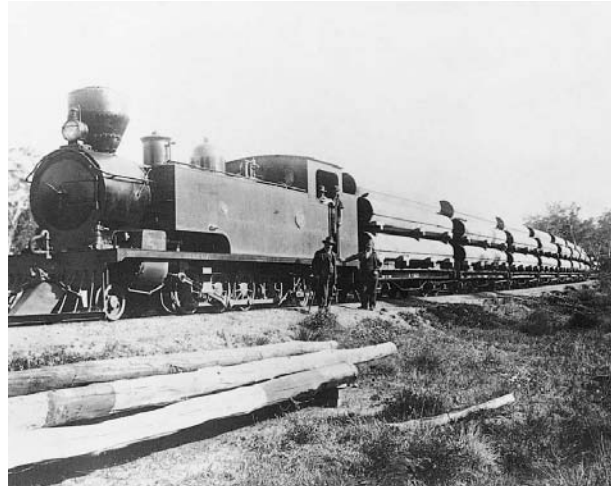


THE GOLDEN PIPELINE  
A NATIONAL TRUST PROJECT

# PIPES OF THE GOLDFIELDS WATER SUPPLY SCHEME



*Mephan Ferguson factory. Closing the locking bar, 1901*



*BL 213427P The pipes were 28 feet (8.5 m) long to fit the railway wagons*

*BL 3359B*

The Goldfields Water Supply Scheme was built between 1898 and 1903 to pump fresh water from the Darling Range near Perth 560 km east through a pipeline to the arid Goldfields. The pipes were the most expensive component of the scheme. Today, the pipeline continues to supply water to Western Australia's Wheatbelt areas and the Eastern Goldfields. The pipes have undergone some changes, replacements and upgrades.

## THE ORIGINAL PIPES

The original pipes were made of steel and constructed using the innovative locking bar system invented by Mephan Ferguson. Two steel plates were each bent into a semi-circle. The long edges were given a dovetail shape. These edges were inserted into an 'H' shaped long bar which was then pressed closed under great pressure to form a joint that ran the

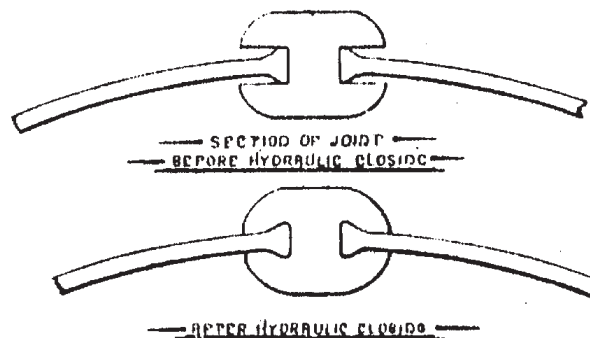
length of the pipe. This locking bar system replaced the need for riveting the plates together and therefore minimised the risk of leakage as no holes were drilled into the pipes. There were also no rivet heads to slow the flow of water through the pipe.

The pipe was then coated with tar and bitumen to help protect the steel from corrosion. This coating was sprinkled with sand to prevent the tar melting in summer heat. The pipes were 28 feet (8.5 m) long to fit the railway wagons which transported the pipes to where they were laid.

## STATISTICS OF ORIGINAL PIPES

Pipe thickness	1/4" (6.355 mm)
Pipe diameter	30" (76.2 cm)
Pipe length	28" (8.5 m)

The steel plates were imported flat from Germany and the United States of America and the locking bars and joint rings came from England. Pipes were manufactured by two contractors who established factories in Perth - Mephan Ferguson, the inventor of the locking bar system, and G&C Hoskins. Hoskins developed new machines to speed up the production process and a pipe could be produced every 6 minutes.



*From plans by G & C Hoskins 1901*



*Caulking Machine, 1902*

BL 000839D

#### LAYING THE PIPES

The pipes were laid in trenches to avoid contraction and expansion caused by temperature extremes. Lengths of pipe were joined together as they were laid, using a process which packed the joint with lead, known as 'caulking'. A ring of steel was fitted around the butted ends of the pipes. A 6 mm clearance left between the ring and the pipe was packed with rope, then molten lead was poured into the joint and hammered into place as it cooled to form a waterproof seal. This process was done by hand until in 1901 James Couston invented a caulking machine that produced a more consistent lead joint and also saved time, labour and costs.

#### CHANGES TO THE PIPES

Over the years major corrosion and leakage problems occurred. During the 1930s the pipes were lifted, repaired or replaced, lined with concrete and re-laid above ground on concrete blocks. Corrosion was particularly severe at the lead joints and these were replaced with welded joints.

Over half of the original locking bar pipes are still in use today and all pipes are now coated with tar and aluminium paint to prevent corrosion.

#### WOOD STAVE PIPES

Laying the pipeline above ground was undertaken during the Great Depression when unemployment was very high. The Goldfields Water Supply Department came under political pressure to replace damaged steel pipes with wood pipes as this would provide jobs, boost the timber industry, and also save costs as they were cheaper. The wood pipes were made of karri staves (small planks) that were bound together with galvanized wire, then heavily coated with tar and bitumen.

A total of 64 km of wood stave pipes were used in low pressure sections of the pipeline between 1933-37. They were plagued with problems of leakage, the threat of termite damage and dry rot and all were replaced by 1971.

FOR FURTHER INFORMATION  
GO TO

GOLDEN PIPELINE WEBSITE:

[www.goldenpipeline.com.au](http://www.goldenpipeline.com.au)

WATER CORPORATION WEBSITE:

[www.watercorporation.com.au](http://www.watercorporation.com.au)

READ

JM Ferguson, *Mephan Ferguson: A Biography*, 1992

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,  
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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

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