HERITAGE COUNCIL OF WESTERN AUSTRALIA

REGISTER OF HERITAGE PLACES - ASSESSMENT DOCUMENTATION

11. ASSESSMENT OF CULTURAL HERITAGE SIGNIFICANCE

The criteria adopted by the Heritage Council in November 1996 have been used to determine the cultural heritage significance of the place.

The documentation for this place is based on the heritage assessment compiled by Cathy Day, Historian, in February 2003, with amendments and/or additions by HCWA staff and the Register Committee

PRINCIPAL AUSTRALIAN HISTORIC THEME(S)

- 3.4.5 Tapping natural energy sources
- 3.6 Recruiting labour
- 3.11.5 Establishing water supplies
- 4.2 Supplying urban services (water)

HERITAGE COUNCIL OF WESTERN AUSTRALIA THEME(S)

- 106 Workers
- 404 Community services and utilities
- 504 Depression and boom
- 507 Water, power, major transport routes

11. 1 AESTHETIC VALUE*

Canning Contour Channel (fmr), a series of concrete channels and joining cast iron siphons constructed following the contours of the Darling Scarp from the Canning Dam to Gosnells (today's location known as Martin), and two stone chimneys located along the length of the channel, is in harmony with its environment and provide a balance between natural and cultural features. (Criterion 1.3)

11. 2. HISTORIC VALUE

The construction of the place provided direct employment for a large number of men under sustenance programs during the 1930s Depression using a large quantity of local materials such as cement. It was one of the projects

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* For consistency, all references to architectural style are taken from Apperly, Richard; Irving, Robert and Reynolds, Peter, *A Pictorial Guide to Identifying Australian Architecture: Styles and Terms from 1788 to the Present*, Angus & Robertson, North Ryde, 1989.

that contributed to the recovery of Western Australia's economy. (Criterion 2.2)

With water sourced from the Canning Dam, *Canning Contour Channel (fmr)* provided the main supply of water to the metropolitan area from 1940 to 1975, when it was superseded by the Canning Tunnel. The place demonstrates the resourcefulness of the Metropolitan Water Supply and the Public Works Department in addressing the problem of Perth's water supply at a time of economic hardship. (Criterion 2.2)

Canning Contour Channel (fmr) was designed under the direction of prominent engineers, Russell (RJ) Dumas, Engineer in Charge of Construction, E. W. Tindale, the Chief Engineer and Resident Engineers Victor Munt and Don Munro, while engineers E. H. Oldham and J. W. Allen supervised construction. (Criterion 2.3)

The design and construction of *Canning Contour Channel (fmr)* was an economically viable technical achievement in a time of economic hardship, requiring a high degree of manual labour due to the hilly terrain that made it difficult to access with mechanical equipment. (Criterion 2.4)

11. 3. SCIENTIFIC VALUE

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11. 4. SOCIAL VALUE

The continued use of parts of *Canning Contour Channel (fmr)* as a walking path by local residents is evidence of its ongoing social value, although no longer for its original purpose. (Criterion 4.1)

12. DEGREE OF SIGNIFICANCE

12. 1. RARITY

Canning Contour Channel (fmr) is the only example in Western Australia of an engineering project designed to transport large quantities of potable water by gravity whilst open to the elements. *Canning Contour Channel (fmr)* had minimal impact on the landscape it traversed. (Criterion 5.1)

Canning Contour Channel (fmr) represents the use of age-old design principles and a method of construction considered viable and appropriate in the circumstances of the time but no longer practised today. (Criterion 5.2)

12. 2 REPRESENTATIVENESS

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12. 3 CONDITION

The condition of *Canning Contour Channel (fmr)* ranges from excellent to poor. Some sections are in good condition, with little change to the fabric since construction in 1937. However, other parts are missing or have been

severely damaged through intrusion by rocks or natural bush growth from the surrounding terrain.

12. 4 INTEGRITY

Canning Contour Channel (fmr) has a moderate degree of integrity given its original purpose is clearly discernable but the place is no longer in use.

12. 5 AUTHENTICITY

Canning Contour Channel (fmr) has a high level of authenticity, with most of the remaining intact original fabric clearly indicating its original state, form and purpose.

13. SUPPORTING EVIDENCE

The supporting evidence has been compiled by Cathy Day, historian. The evidence has been prepared using the work of Dr Richard Hartley (Engineering Heritage Consultant) and Wendy Brady (Historian) from the Canning Dam Conservation Plan 1998.

13. 1 DOCUMENTARY EVIDENCE

Canning Contour Channel (fmr) was originally a 16 kilometre long series of water channels connected by pipe sections over the gullies. Built between 1935-37 for the Metropolitan Water Supply, Sewerage and Drainage Board, *Canning Contour Channel (fmr)* has a number of associated works such as the stilling chambers (1937) and the Gosnells Screens (1937). It is the only contour channel built in Western Australia for the transport of potable water.

As early as 1878 the Canning River was recognised as a good source of water for the Perth region. Throughout the rest of the 19th century various proposals were made to dam the Canning River and pipe the water to the metropolitan area. In 1897 an engineer Thomas Hodgson surveyed and proposed a possible dam site, this later became Site No.1 for the Canning Dam but it was to be nearly half a century before the dam was to be constructed.[1]

In 1925 F. Stileman was appointed Engineer in Chief of the Public Works Department. He produced another report on the various options for a dam site and concluded that the Hodgson site chosen in 1897 was almost ideal. Stileman recommended that the construction of a concrete gravity dam should be commenced without delay.

However, the new dam was not commenced in the 1920s owing to the impact of the world Depression. By 1930 it was estimated that 10,000 people in Western Australia were dependent on government assistance. In recognition of the huge unemployment crisis, the State Government in 1931 appointed a special Unemployment Board. The Public Works Department proposal that to commence the construction of the Canning Dam would employ a large number of men and use great quantities of local cement providing further employment opportunities, and the Unemployment Board recommended this proposal. The decision by the government to commence the building project with an estimated cost of £1,250,000 was popular and reassuring to the Western Australian people. In 1931 clearing the unoccupied, forested valley behind the dam was commenced with between 100 and 200 men employed over six months.[2]

After a number of proposals for the dam's design (not without inter-departmental controversy) Dumas finalised the plans for the Canning Dam in 1933. The dam was to be 66.4 metres (218 feet) high with a wall level of 205.9metres.[3] By Christmas 1933 the preliminary work on the dam was

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1 'Canning Dam Conservation Plan' Prepared for the *Water Corporation* by Heritage and Conservation Professionals 1998 page 14.

2 Ibid page 17.

3 Ibid. page 18

well in hand and the once quiet valley in the Darling Ranges was a scene of intense activity.[4]

By 1934 the dam wall began to take shape. At either side of the valley two steel towers 78 metres high, draped with a network of wires and cables, supported the long chutes used for carrying the mixed concrete down to the wall below.[5]

At the western end of the valley, downstream from the Dam was the Canning Township, complete with Post Office, general store, recreation hall, and school. On the slopes of the hillside to the north were the single men's tents and wooden cubicles. The married men's cottages were stepped into the hill at the western end of the valley overlooking the shops. On the south side were the resident engineers' residences and staff quarters.[6]

In the seven years it took to build the dam many hundreds of workers were employed in the project. In the early phase the need to make quick progress on the wall prior to the onset of winter rains resulted in three shifts a day being worked. Lights were erected because some of this work was done at night.[7]

The cement came from Rivervale, the sand from a pit near Armadale and the rock was quarried on site. Once the initial plant had been installed the method of placing the concrete in the wall was relatively straightforward. The mixed concrete was hoisted electrically in a skip to the required level on the chuting tower, tipped automatically into the chutes then directed by means of revolving trusses into the wooden frames or boxes prepared beforehand. Granite spalls were then placed by hand in the box and the whole compacted with pneumatic vibrators.

Generally construction work proceeded smoothly and from an engineering point of view there were few setbacks. However, one did occur in the early stages of construction. In March 1934 there was a violent storm bringing 130mm of rain in less than two days. As a result the river rose rapidly and entirely flooded the dam foundation workings. Pumps had to be installed and work resumed three days later. The method used to overcome flooding difficulties was to raise the wall as quickly as possible in the summer months, leaving a gap near the middle through which the winter floodwaters could escape. It was then possible, even in the flood periods, to continue building up the wall on either side of the gap, which was later filled in when the water level subsided in summer.[8]

The dam was completed in September 1940. The final cost of the dam was significantly less than had been originally budgeted for, and the work was completed on schedule to a date that was calculated by the engineers seven years previously.

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4 Notes on Canning Dam Produced by the Metropolitan Water Supply, Sewerage and Draining Board June 1981 Held at *Water Corporation* Information and Library Services, Leederville.

5 Ibid

6 Ibid.

7 Ibid.

8 Ibid.

Russell Dumas, as Engineer in Charge of Construction, and from 1934 as Engineer of the Metropolitan Water Supply, held overall responsibility for construction of the dam subject to the supervision of E. W. Tindale, the Chief Engineer. Victor Munt and Don Munro, both in their late twenties, were the Resident Engineers who had the day-to-day responsibility for all aspects of the construction of the dam. Other professional workers on site for varying lengths of time included engineers Frederick Lawson, Thomas Hodgson, Frank Botterell, Eric Stoddart, M. Whitfield and W. T. Graham, surveyors Bill Fawcett and J. M. Cohen, draftsmen E. G. Turnball and A. L. Dent. Administrative and clerical duties were carried out under the direction of Harold Riva.[9]

A large labour force was required for the Canning Dam project and in the main it came from the ranks of the unemployed men who were registered with the state labour bureau and in receipt of sustenance. Within weeks of the project being announced several hundred men were working on the site. Some came with public works experience while others included men unused to manual labour. These men were engaged in operating concrete mixers, hoists and jack hammers or worked in concrete gangs spreading, tamping and vibrating the concrete in boxes. Others were employed in the crushing plant or adjacent quarry as labourers, drillers and powder monkeys. The men employed on the dam wall were organised into gangs under the general foreman Bill Slingsby and the foreman fitter Bob Collins. Those engaged in the quarry or on carting sand and cement were the responsibility of the individual contractors.[10]

The idea of an open contour water channel had first been recommended by a Mr Ritchie in a water supply report presented in 1920. After comparing the merits of pipeline versus open channel, Mr Ritchie concluded the most economical way to convey water was by open channel.[11] In 1935 E. W. Tindale the Director of Works supported this conclusion. He said that a contour channel would keep costs low and as he had seen this type of operation work successfully in Victoria he believed it could also work in Perth. The projected cost for the Contour Channel and associated pipeline was £155,000, with £130,000 advanced on 3 July 1935.[12]

Canning Contour Channel (fmr) was commenced in June 1935 under the supervision of Engineers E.H. Oldham and J. W. Allen. Until its completion in 1937, all water from the Canning to Perth was conveyed through a 762mm pipeline from the dam to Kelmscott and a 914mm pipeline from there to the storage reservoir at Mt Eliza in King's Park. This pipeline was only a temporary measure. Once the rising dam wall increased the storage capacity of the partly completed dam and hence increase the volume of water available, the water was released to be conveyed through *Canning Contour Channel (fmr)*.

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9 Canning Dam Conservation Plan op.cit page 21.

10 Ibid. page 21

11 *Water Corporation* File 10A01575 *Canning Contour Channel* Folio 12

12 *Water Corporation* File 10A01575 Folio 32

Canning Contour Channel (fmr) followed the Canning River Valley for a distance of 16kms to a point in the foothills above Gosnells. From there a 1.37m pipe took the water to Cannington where it connected with mains to Fremantle and Mt Eliza. *Canning Contour Channel (fmr)* walls were constructed with concrete made with base of local gravel - oolithic laterite, and passed through thick bush and at times traversed extremely steep sided valleys and gullies making access very difficult. *Canning Contour Channel (fmr)* was cut into the sides of the hills and a number of piped siphons were also built to pass the channel water from one side of the valley to the other or to cross under existing roads.

A statement by the Under Secretary for Water Supply Mr G. H. Long describing the construction of *Canning Contour Channel (fmr)* and the siphon pipes was made in *The West Australian* on 8 August 1936.

> Siphons across shallow gullies have been constructed of 30 inch diameter cast iron pipes removed from Stirling Highway and before being reused have been concrete lined and reconditioned. Two lines of these pipes have been laid with lead joints at each siphon, the total length of which is 3,550 feet.
>
> At steeper and deeper valleys 42 inch diameter steel(??) pipes are being laid. The pipes are concrete lined and when buried underground are wrapped on the outside with cement-asbestos…….After being placed in position the pipes are welded together, forming one continuous pipe line.
>
> Some of the gorges have precipitous rocky sides and considerable ingenuity has been displayed in placing the pipes in position for welding. The line of the siphon is first surveyed and closely levelled so that the final setting of the pipes can be drawn on a plan before construction is commenced. The line is cleared and a 24inch gauge tram line laid across the valley a few feet from the siphon centre line. The pipes are delivered at the head of the siphon, they are loaded one at a time on low trolleys and lowered by means of a winch to the bottom of the valley. A hoist placed at the head of the siphon then hauls the pipe on its trolleys up that side until it is opposite to its final position. It is then rolled off and jacked into contact with the pipe immediately below it and welded to it. The pipes when not buried are mounted on short masonry piers.[13]

Owing to the difficult terrain, mechanical devices used on the building of *Canning Contour Channel (fmr)* were few. Light rail was laid in the completed parts of the channel to take equipment and pipes to the workface. Photographic evidence[14] shows a small tractor but by and large the photographs of the channel site works show many men using the basic implements of picks, shovels and wheelbarrows. Simple pulleys, sheer legs, block and tackle were used to position the cast iron siphon pipes. Horse and cart were used to take equipment into the areas that were not too steep.

The workers employed on the construction of the channel lived in camps in varying places along the channel. The camps were made of tents with few permanent built structures, except for the occasional stone chimney that was used to dry the workers clothing. The construction of *Canning Contour*

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13 *The West Australian* 8 August 1936 Report in *Water Corporation* File 10A01575

14 *Water Corporation* Historical Photographs Held at Library and Information Services *Water Corporation,* Leederville.

Channel (fmr) required considerable ingenuity and its construction involved backbreaking work for the several hundred sustenance workers involved. The sustenance workers were drawn from the large body of unemployed men created by the severe decline of the Western Australian economy during the Great Depression. However, it must be noted that though many of the men employed were sustenance workers, a large number of the foremen and lead gangers were permanent water supply employees. Despite the hard work the project at least provided work while it lasted. In January 1937 when the channel and the pipe main were completed 320 men were laid off. The actual cost of the work was lower than originally projected coming in at £125,000.[15]

Water from the Canning Dam was released into twin parallel stilling chambers, 200m from the dam, passed through a flow recorder and then ran over boarded weirs into a concrete lined open contour channel which carried the water 16km down the Canning Valley to join a trunk main at the Gosnells screens. The valley was crossed in several places by piped siphons, the first being 250m from the stilling chambers. At the Gosnells screens the water was filtered of any polluting matter and chemicals such as fluoride were added through a chlorinating plant (built c1954). The water then entered the pipes for the rest of the journey to Perth.

Canning Contour Channel (fmr) remained an integral part of the Perth water supply from the time it was first commissioned until 1975 when it was retired once the Canning Tunnel pipeline was opened. During the decades of its operation the maintenance of *Canning Contour Channel (fmr)* was a daily task for up to three gangs of men (one gang checked the Kangaroo Gully Contour). Each day during the summer months, when the channel was flowing, a man walked the full 16km length to report on its operation. The person inspecting the channel would try and rectify any problems found or take note of the position on the channel and a team would then go in with tools to fix the obstruction or cracks in the concrete walls. A sample inspection report from the Metropolitan Water Supply, Sewerage and Drainage Department highlights the types of problems the maintenance workers faced.

> Slab Gully siphon being undermined by stormwater from the Karragullen Rd requires stone pitched drain from road culvert leading under pipe distance about 1.5 chains. To be done this summer. Drain carrying Slab Gully Brook under siphon requires patching and concrete wall raising about 1 foot, only a small job, requires doing this summer.[16]

Further maintenance work required was the cleaning of algae, scrub bashing to clean the banks either side of the channel and constant checks for the stability of the land on the high side of the channel to prevent rock falls. Other problems were caused by children throwing rocks into the water to create a small dam wall further blocking smooth passage of water flow.[17]

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15 Canning Dam Conservation Plan op.cit. page 31.

16 *Water Corporation* File 10A01575 Folio 120

17 Personal Interview with Les Dawkins *Water Corporation* Senior Customs Support Officer based at Canningvale, who was formerly a maintenance worker on *Canning Contour Channel*. Interview conducted by Cathy Day 12 November 2002.

From its initial opening *Canning Contour Channel (fmr)* faced difficulties. Up to 20% of the water released from the Canning Dam leaked from the channel. Constant small breaks and cracks required vigilant maintenance. On top of this when it rained heavily, dirt, bark, leaves and other matter would pollute the water. The Gosnells Screens at the terminus of *Canning Contour Channel (fmr)* played an important role in the cleaning of the water before it entered the pipeline to Perth. The screens made up of a battery of six fine wire screen enabled the filtering of the water of leaves and the remains of kangaroos, emus, birds, snakes, goannas and much other wildlife that became trapped in the swiftly flowing water of the channel[18] 'Prior to the instalment of the chlorinating plant regular weekly samples of water were taken from the screening chamber and examined in the bacteriological laboratories of the Health Department'.[19] In c1954 a chlorinating plant was built at the Gosnells screens along with a large shed used for the storage of chemicals.

A major disruption to Perth's water supplies occurred in 1950 when a section of the contour channel near Araluen collapsed and water restrictions had to be imposed on the city. Supplies were restored with by the extension of one of the siphons to bypass the collapsed section of the channel. The Canning Dam was the main source for Perth's water supply until supplemented by the Serpentine Dam completed in 1961.[20] However despite the demonstration of the vulnerability of *Canning Contour Channel (fmr)* it was not until the 1970s when an alternative was finally introduced.[21]

Supervising engineers of *Canning Contour Channel (fmr)* included E. H. Oldham and J. W. Allen. One of the lead gangers involved (under foreman Mr Babs) was Jim Pyke. He was in charge of about ten men. Jim was a lead burner, which was the fabric used to join the cast iron pipes, though he was multi skilled and was also involved in the pouring of the concrete for the channel walls.[22]

Maintenance men known to have long-term involvement in *Canning Contour Channel (fmr)* include Les Dawkins, Keith Buckingham, Johnny Goodall, John Prugnoli and Keith Towton. Les Dawkins worked as a channel cleaner in one of the work gangs from 1972-75 and was still employed by the Water Corporation (previously known as Metropolitan Water Board and Water Authority of Western Australia) in 2002. Les remembers specially made equipment used for maintaining *Canning Contour Channel (fmr)* such as a mechanical wheelbarrow contraption for removing algae. The whereabouts of the equipment is not known.[23]

Johnny Goodall was one of the inspection people who on a daily basis walked the full length of the channel (whilst flowing) for his twenty years

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18 Ibid.

19 *Water Corporation* File 10A01575 Folio 85

20 Canning Dam Conservation Plan op.cit page 66

21 Ibid page 35.

22 Personal interview with Dr Les Pyke Son of Jim Pyke. Interview conducted by Cathy Day 15 November 2002.

23 Les Dawkins Op.cit.

working life at the Water Corporation. Johnny was responsible for the rockwork that is still clearly visible at the site of the Gosnells screens. He was very proud of his work and maintained the Gosnells screens area at a very high standard.[24]

Keith Buckingham (from a local Roleystone pioneering family) was a foreman of the maintenance crews and was reputedly a very hard taskmaster. Keith told Les that the workers in the early days of constructing *Canning Contour Channel (fmr)* travelled back each night to a camp at Kelmscott Depot known as "The Yard".[25] John Prugnoli and Keith Towton were both maintenance workers on *Canning Contour Channel (fmr)* during the 1970s.

Owing to the constant maintenance and problems that arose from the open method of transferring water to Perth from the Canning Dam, the construction of a tunnel from the Canning Dam to Roleystone commenced in 1973. *Canning Contour Channel (fmr)* was retired in 1975 with the launching of the Canning Tunnel which was officially declared opened by Hon. D. H. O'Neil MLA the Minister for Works and Housing on Friday 17 January 1975.[26]

As a precautionary measure, *Canning Contour Channel (fmr)* was maintained and opened to a flow of water in the summer for two years after its official retirement. During the last years of operation of *Canning Contour Channel (fmr)*, Stephen O'Brien the Gosnells Local History Librarian and resident of Roleystone, remembers children playing in the channel. Stephen's father made a canoe which Stephen and his brother floated down the channel when the flow was low and not swiftly flowing. He also has memories of children using surfboards to play on in the channel.[27]

In 2005, *Canning Contour Channel (fmr)* is no longer used for any formal purpose, although locals utilise it informally as a walking trail.

13. 2 PHYSICAL EVIDENCE

Canning Contour Channel (fmr) comprises a series of water channels connected by pipe sections over the gullies, and two stone chimneys associated with the construction camps for the channel. Built between 1935-37 for the Metropolitan Water Supply, Sewerage and Drainage Board, *Canning Contour* has a number of associated places including the stilling chambers (1937) and the Gosnells Screens (1937). It is the only contour channel built in Western Australia for the transport of potable water.

Canning Contour Channel (fmr) is set in the Canning River Valley. The landform consists of a series of steep to moderately steep sided undulating hills and valleys typical of the Darling Plateau. The natural vegetation

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24 Ibid

25 Ibid

26 Canning Tunnel: The Official Opening Prepared by William C Brown Government Printers WA 1975.

27 Personal Interview with Stephen O'Brien City of Gosnells Local History Librarian and former resident of Hawkstone Rd Roleystone. Interview conducted by Cathy Day ***Heritage*TODAY** 7 November 2002.

formation of the area close to the Canning Dam is tall open forest of jarrah, black butt and marri. Closer to the Martin end of *Canning Contour Channel (fmr)* the forest thins out and features sheoak, flooded gum, wandoo and banksia vegetation interspersed with rocky outcrops that support little to no vegetation other than low heath shrubby plants.

Canning Contour Channel (fmr) starts from the Canning Dam in Illawarra and is set in various places throughout the Canning Valley, passing through Roleystone, Araluen, Kelmscott and Martin. It crosses a number of different land ownership boundaries from State Forest, CALM land, private land (with numerous owners) and land still vested in the Water Corporation which Water Corporation would like to dispose of for private use.

Canning Contour Channel (fmr) was used to carry the water from the stilling chambers approximately 16kms to the Gosnells screens (actually in Martin), with a number of siphons along the distance when gullies needed to be traversed. *Canning Contour Channel (fmr)* extends from the stilling chambers approximately 250m on the northern side of the valley to the first siphon. It then continues on the south side of the valley towards Roleystone. The entire length of *Canning Contour Channel (fmr)* and siphons, from the Canning Dam to the Gosnells screens, was inspected in November 2002.

Canning Contour Channel (fmr) is approximately 1.5m wide at its base with raking sides at 45 degrees banking up to the natural ground level. At ground level the channel is approximately 5m wide and the overall depth of the channel is approximately 2m deep. The channel was cut from the natural ground or rock as it was found and lined with concrete for its full width. The concrete was made from Western Australian made cement transported to Roleystone by truck and mixed with locally sourced gravel – oolithic laterite.

Canning Contour Channel (fmr) was built using natural rock walls when possible and followed the contours of the land so that the channel ran 'downhill' only slightly over the distance. The cast iron, lead joined siphon pipes (ranging in diameter) took the water across the gullies.

The siphons and drainage pipes were built supported by a series of concrete piers, anchors and bolsters.[28] The siphons ranged in size and at some points required overflow pipes to control the flow. This can still be clearly seen at the head of the Stony Gully siphon near Contour Rd.

To control water run off from the slopes above the contour channel a series of drains were built to guide the water to pipes that went either over or under the channel to spillways. This was necessary to endeavour to keep the water as clean as possible in the channel. Another addition to help keep the water free from pollutants was the screens placed at the beginning of each siphon point.

Little is left at the Gosnells screens but it used to be an integral part of the operation of *Canning Contour Channel (fmr)*. The screens filtered the water

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28 *Water Corporation* MWSS&DD Plans for *Canning Contour Channel* as constructed 1938. Held at *Water Corporation* Information and Library Services, Leederville.

of foreign bodies before the water went into the pipes that carried the water from this point to Perth. At this stage the chlorinating plant built alongside the channel also treated the water. In 2005 the built features that remain at the Gosnells screens include the footings of the chlorinating plant house, the pad of the chemicals shed, the brick footings of some small structures close to the pipe head and the original channel walls (now filled in with sand).

The original supply pipe that carried water from the valve house opened into a reinforced concrete pair of parallel stilling chambers. These are approximately 35m long, 3m wide and 2.5m high and located on the northern bank of the valley. These chambers originally acted to reduce the velocity and power of the water under pressure before it flowed on to the contour channel.

The concrete structure of the stilling chambers is intact and in good condition although it has not carried water for some time and there is some intrusion from local vegetation. Markings on the wall clearly indicate the water level when the chambers were in use. The timber weir boards at the downstream end of the chambers are intact and are in good condition with little evidence of deterioration.[29]

Approximately 50m along the contour channel, downstream of the stilling chambers, is a bulge like construction in the channel and a small red brick building, approximately 20m square with a single door entry and gable roof. This held the equipment to measure the flow rate of the water through *Canning Contour Channel (fmr)*. The equipment, which would have extended from this building into the channel, is no longer there. The exterior of the building shows reasonable condition.

In 2002, *Canning Contour Channel (fmr)* ranged in condition and integrity from excellent to poor. Some parts of the channel, particularly siphons, have been removed altogether. The channel is sometimes incredibly clear and walkable while other times it is totally full of vegetation or blocked and half filled with water.

There are two essential parts of *Canning Contour Channel (fmr)*: on Water Corporation land from the Canning Dam to the edge of private land just before Croyden Rd and from Contour Rd through to the terminus of the channel at the Gosnells Screen in Martin off Mills Rd. In these sections the fabric of the channel and siphons is still intact (except for one small section where a siphon has been removed from the Gosnells Screens vicinity) and the condition fairly good. There are some cracks in the concrete walls of the channel and the siphons appear sound with some slight evidence of rusting.

Where *Canning Contour Channel (fmr)* crosses private land from just before Croyden Rd through to Contour Rd, the channel and siphons have a number of intrusive elements. In some parts the channel is being used as a dumping ground for rubbish and parts of the channel plus siphons have been removed, leaving little evidence of their former existence. There is also evidence of damage in a number of places along the channel where

29 Ibid page 87.

walls have caved in owing to washaways or major rock falls. The sections of the channel that cross private land are not included in the Registered place.

No archaeologist was involved with this study. However according to an assessment made by Historical Archaeologist Gaye Nayton in the *Canning Dam Conservation Plan 1998;*

> The nature of the Stilling Plant Contour Channel and Siphon is such that they do not accumulate archaeological deposits associated with their use. There is likely to be some evidence in the area surrounding them associated with their construction. Evidence of the old pipe line to the stilling chamber exists in the form of a line of concrete supports to the north of the present pipeline. Bottle glass was found scattered over this area.[30]

Of potential archaeological interest are two stone chimneys that still stand along the route of *Canning Contour Channel (fmr)*. Chimney One is situated 80 metres down a track from McNess Drive and 150m from *Canning Contour Channel (fmr)*. The track is one kilometre north of the junction between McNess Drive and the road to the north wall of the Canning Dam. Other indicators to find the track are powerlines crossing McNess Drive and some non-indigenous trees that mark the track. This site is not accessible by car for the public as the track is chained off.

Chimney Two is visible from McNess Drive on the right hand side of the road whilst travelling north. The chimney is approximately 2.5kms from the junction of McNess Drive and the Canning Dam north wall road. The chimney is located in a designated picnic site.

There is also a third chimney located on Peet Rd 750m north of the junction of Peet Road and Brookton Hwy. It is on the left hand side of the road going north up the hill. It is clearly visible from the road as it is only about five metres from the road edge. It is opposite the junction of Mackie and Peet Rd, Roleystone. This chimney is not included in the Registered place.

The two stone chimneys are the remnants of the campsites of workers on *Canning Contour Channel (fmr)*.[31] Anecdotal evidence suggests they were inside large temporary sheds built for the workers but this has not been confirmed. The two stone chimneys show the use of light rails as lintels for the fireplaces.

13. 3 COMPARATIVE INFORMATION

Kangaroo Gully Contour Channel

In 1952 the intake of water into Canning Dam was augmented by the diversion of a stream, from the adjacent Kangaroo Gully catchment, by means of a pipe head dam and contour channel. Supplies from this source which flow into the dam about 800 metres upstream from the wall on the north bank are estimated to be 2,100,00 cubic metres per year.

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30 Ibid page 111.

31 Personal Interview with Kim Fletcher City of Armadale Community Heritage Committee. Interview conducted by Cathy Day ***Heritage*** **TODAY** 7 November 2002.

Though the Kangaroo Gully Contour Channel is built on similar design principles to *Canning Contour Channel (fmr)*, its intent and purpose are different. The Kangaroo Gully Contour Channel, built above the Canning Dam, diverts water into the dam while *Canning Contour Channel (fmr)* carries the potable water from the dam – the only channel to be used for this purpose in Western Australia. The Kangaroo Gully Contour Channel has not been nominated for any heritage list or register.

South West Irrigation Channels

Other concrete lined contour channels built in the south of the state are used for irrigation purposes only. However, the design of these is based on the same principles for transporting water – principles that go back to Roman times. It is in the construction that *Canning Contour Channel (fmr)* and the irrigation contour channels differ the most. Owing to the terrain, mechanical excavation was not possible in the Roleystone area so *Canning Contour Channel (fmr)* was built with manpower using simple tools. The contour channels south of Pinjarra were built with a high degree of mechanisation.

Canning Contour Channel (fmr) is the only example in Western Australia of an engineering project designed to transport large quantities of potable water by gravity whilst open to the elements.

13. 4 KEY REFERENCES

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13. 5 FURTHER RESEARCH

A heritage assessment for the Canning Dam should be prepared.