

The Hutt River scheme

The Water Supply Board was well aware by the mid-1930s of the need for a new source. Wellington had “very seldom for any length of time been able to sit back and congratulate herself upon an entirely adequate water supply”.¹⁷⁷ Constant expansion, plus the first Labour Government’s intended housing schemes in the Hutt and Porirua basin, would further increase pressure on existing supplies.

The Hutt River’s headwaters were investigated in 1906 as a site for a hydro-electric dam, but Mangahao, behind Shannon, was favoured. In 1919 the city engineer suggested the Hutt River be developed after the Orongorongo.¹⁷⁸

The untapped Akatarawa and Whakatikei catchments were also surveyed and portions of the Little Akatarawa watershed acquired in 1928 and 1936.¹⁷⁹ Also purchased (in 1939) were 63 hectares at Kaitoke, for the Hutt River headworks.¹⁸⁰ While the surveying stopped in 1940, the situation was reviewed two years later by Waterworks engineer Edgar McKillop, supported by the government’s geological surveyor John Henderson.¹⁸¹

Bob Semple, Minister of Works and past-master in waterworks projects, drove the effort for a new scheme. In February 1943, Semple asked for information on potential water schemes to supply 15,000 houses in

the Porirua basin. In supplying the information, the board sensed the offer of government money and “omit[ed] references to the economics of construction”, that it “cannot be justified on economic grounds”.¹⁸² The Hutt option was now, as Scheme X, contrasted with a cheaper scheme (Y – enhanced artesian and Little Akatarawa waters). Semple visited the Kaitoke site in April with City Engineer KE Luke, who detailed the river scheme in his 1943 report.¹⁸³ “Rigid economies” were already required in higher parts of the city during dry weather periods, and Luke warned that without recourse to the Hutt gravity scheme, “even with such economies, it is unlikely that rationing in some form or other can be wholly avoided”.¹⁸⁴ Additional intake weirs had already been added to the Orongorongo valley’s Big and Little Huia streams and Telephone Creek and, when the O-K main’s carrying capacity dropped 25 percent through encrustation, another intake was approved for upper George Creek on the Wainuiomata side of the range.¹⁸⁵ Enthusiasm for artesian waters had waned with recent incidents in Foxton and Lower Hutt of cross-pollution, in which ‘negative pressure’ in leaking wells sucked in polluted ground water from nearby septic tanks.¹⁸⁶

Government water

The Government endorsed the board’s proposal and agreed to fund the Hutt River scheme (the cost being £1.1 million excluding service reservoirs and branch lines), but then “to hand over the works on completion to the Wellington City Council, to operate on behalf of the [Water Supply] Board’s members”.¹⁸⁷ In reaching this agreement, the members horse-traded their allocated proportions of water: Wellington saying it should not agree to any volume less than 25 million litres per day, otherwise it represented “no gain”.¹⁸⁸

A number of factors led Luke to alter the pipeline route, which from the 1929 report would have gone straight down the Hutt Valley, to join existing mains at Petone.¹⁸⁹ The ultimate destination (because of the Government’s housing scheme) was now Porirua, far to the northwest. The pipeline now also had to skirt the non-members of the board in the lower Hutt Valley (an attempt to woo them back in 1948 had failed).¹⁹⁰ Lower Hutt and Petone’s withdrawal from the board in 1930 had “seriously handicapped” its planning for any comprehensive water supply scheme (particularly choosing trunk routes) ever since.¹⁹¹ Avoiding the Wellington fault line was also sensible, but wartime provided another reason not to lay the pipes along the Hutt foreshore: they could “be disrupted by earthquake or enemy action”.¹⁹²

The route chosen was to go through the upper Hutt Valley to Haywards Hill, then over to Judgeford (in 900-millimetre pipes). After the line branched off for Porirua and Plimmerton, a 750-millimetre pipe was to head south through more tunnels, past Tawa, Johnsonville and Wilton to the Karori reservoir.¹⁹³ The Ministry was to lay the pipeline to Wellington’s boundary with Johnsonville at Maldive Street, whereupon Wellington Waterworks (which became a separate branch in the City Engineer’s Department in 1949) supervised the remaining pipe-laying.¹⁹⁴



Laying of the Porirua branch line off the Kaitoke-to-Karori water main. (The Dominion Post, Wellington, NZ)



Stewart and Lloyds' steel pipes from Britain being loaded on a truck at Wellington wharf for delivery to Kaitoke, 1950

The Ministry of Works, with Edgar McKillop now Permanent Head, carried out design and construction work to the general requirements of the Water Supply Board and subject to the joint approval of the Ministry's engineer-in-chief and (acting for the board) WCC city engineer. Detailed engineering studies started in February 1944, with the ministry building 14 kilometres of access roads to Kaitoke from June 1945 – and later to parts of the hilly, swampy pipe route. An experimental weir established earlier on Farm Creek only just survived a flood on 28 October.¹⁹⁵ The land for the headworks at Kaitoke had already been purchased by exchange in 1939.¹⁹⁶

Progress on the scheme was impeded by war-related shortages. New Zealand's war-time manpower shortage continued into the 1950s. Steel was in short supply. Work until January 1950 was therefore limited to road and tunnel construction. The outbreak of the Korean War again made the delivery of steel "uncertain".¹⁹⁷ While steel pipes were eventually imported from Britain, steel plate was also brought in for fabricating into pipes (more than half of the main pipeline was made in New Zealand this way).¹⁹⁸

Kaitoke water

The heart of the headworks is an intake weir, essentially a low, concrete, gravity dam 40 metres wide and eight metres high. This raises the normal water level by four metres to allow a flow into the tunnel conduit. Construction work on the weir was hampered by confined working space; the site is subject to flash floods and there is no room for a bypass tunnel.¹⁹⁹

The intake is 200 metres above sea level. The water passes through a short tunnel then crosses the river on a flume bridge (aqueduct). It then enters settling chambers to remove sand and silt, and passes through automatic rotary strainers to remove twigs and leaves. The flow of water is measured, and since 1965 has been chlorinated and fluoridated (this function taken over by the Te Marua treatment plant by 1990). From the strainer building, the water enters a 2.8-kilometre tunnel and emerges in a chamber in the hills above Te Marua.²⁰⁰ From here it is piped to Karori.

Construction work included six tunnels (totalling nearly five kilometres), 54 kilometres of main pipeline, and approximately 12 kilometres of branch lines. In all, 10 reservoirs were built for the original project and two pumping stations erected, at Johnsonville and Karori, for back-pumping to Upper Hutt. Back-pumping allowed water to be shut off at

Kaitoke after storms made it too turbid or coloured, and pumped back up the pipeline from Karori to serve users en route. A turbidimeter – for measuring dirt particles in the water – was installed at the headworks in 1958.

As built, the scheme's capacity was 50 million litres per day, but the headworks were designed for later doubling this figure and duplicating the pipeline.²⁰¹ Wellington won its 25 million litres per day. The rest was apportioned to the other board members: Upper Hutt, Makara County (replaced by Porirua in 1962) and Hutt County.²⁰²

The Kaitoke scheme (as it is now generally called) was completed in 1957 and was operated briefly by the Ministry of Works before being handed over to the Water Supply Board on 1 April. It proved very successful as a cheap gravity scheme.

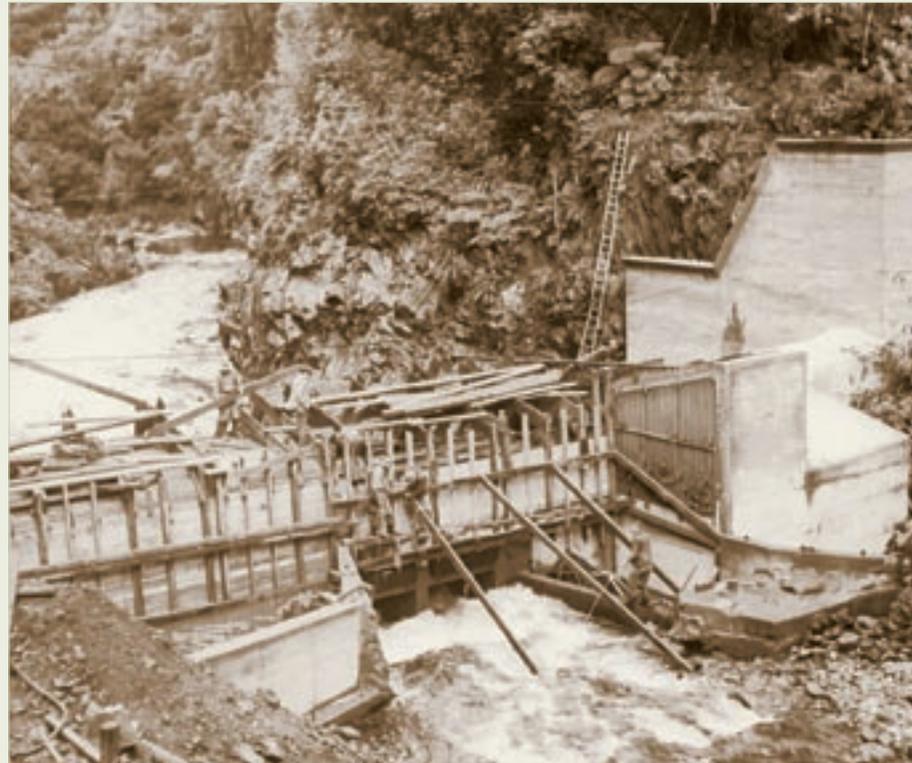
Water from the scheme arrived in stages to the consumers. First to receive it was Upper Hutt in 1954, followed by Trentham. From there, receiving supplies for the first time were Pinehaven, Stokes Valley, Haywards, Plimmerton, Porirua, Tawa and Newlands (in 1959). With the coming of Kaitoke water, many of these areas abandoned their unsatisfactory earlier supplies.²⁰³ Communities further away, such as Paremata, had to endure "a hot dry Christmas" or two before the Kaitoke pipe reached them.²⁰⁴ Kaitoke first showed

its major value when a storm on Boxing Day 1962 shut down the Wainuiomata and Orongorongo supplies.

By 1956 the cost of steel plate had trebled, wages had doubled over the 10-year period, and various extensions had been made to the existing project. The original 1943 cost estimate fell far short of the actual costs of £3.4 million.²⁰⁵ When Auckland's mayor, JH Luxford, heard that the Government was subsidising 43 percent of this he 'boiled over', saying it was an "unjustified preferential treatment for Wellington".²⁰⁶

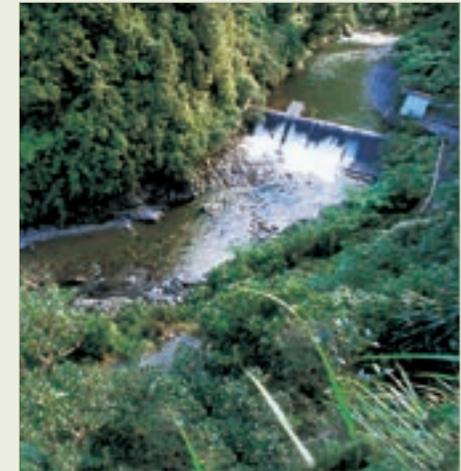
Petone Borough and Lower Hutt City remained reliant on their artesian sources. Petone discontinued its surface water supply from the Korokoro Stream when its quality proved to be unsatisfactory, replacing it with new wells and a pumping station built in Buick Street in 1963.²⁰⁷

Kaitoke supplied enough additional water throughout the region for the next 15 years. Consumer demand increased due to steady population growth, increased water usage for gardening, and with domestic novelties such as automatic washing machines and swimming pools.²⁰⁸ Augmenting Wellington's distribution system, the O-K main was connected to the pipe feeding Bell Road via a break-pressure tank, in 1953.²⁰⁹ New service reservoirs were constantly needed. Among these was the eight-million-litre



Carmichael reservoir in Newtown (1960), named in honour of Wellington's recently-retired water engineer. It serviced Island Bay, Lyall Bay and Miramar. Others were Emerald Hill (Upper Hutt), Hayward substation (both 1.1 million litres) and Porirua East (4.5 million litres), all constructed in 1966, plus a new 4.5-million-litre reservoir for Tawa Borough, completed

in 1971.²¹⁰ The new Hutt estuary bridge was completed in 1964, with 675-millimetre and 525-millimetre pipes to carry water from Wainui and the Orongorongos respectively over the Hutt River mouth. After 51 years in service, the old pipe bridge was demolished the following year. The back-pumping capacity at Karori was increased in 1968 from 22.5 to 40 million



The water intake at Kaitoke on the Hutt River, seen here under construction (September 1952, left) and complete (above). Building the intake proved challenging, as it is situated in a narrow gorge that is subject to flash floods and the river could not be diverted away from the construction site.

litres per day. This alleviated the limitations of the Kaitoke scheme when the Hutt River was low or dirty. Described as Kaitoke stage two, a booster pumping station and second 18-million-litre reservoir were constructed at Haywards. Completed in 1971 at a cost of \$600,000, it doubled the system's capacity to 100 million litres per day²¹¹.