

WORKING WITH THE WEATHER



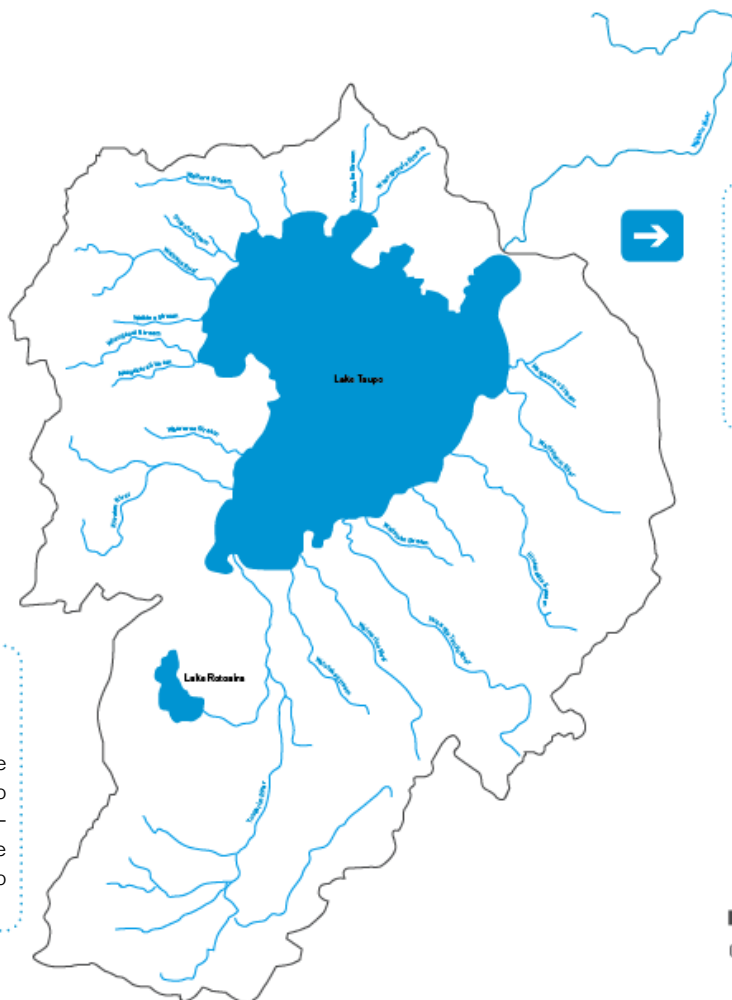
CATCHMENT

The rivers and streams flowing into Lake Taupo bring water from a vast catchment area – around 3800 sq km, and feed it into the lake.



WATER FLOWS OUT

Lake Taupo has more than 30 streams and rivers flowing into it, and only one river – the mighty Waikato River – taking water out.



WATER FLOWS IN

The largest inflows come from the Tongariro River and the Tongariro Power Development, which channel water from the peaks in the Kaimanawa Ranges and Tongariro National Park.



CATCHMENT DIAGRAM



DID YOU KNOW?

With the Taupo Gates fully open, approximately 300m³ per second can be discharged from the lake. When it rains a lot, the amount of water flowing into the Lake from the wider catchment can be closer to 3,000m³ per second – that's 10 times the amount of water flowing into the Lake than can flow out through the Taupo Gates! This means the Lake can rise very quickly, but it takes much longer for the water level to go down, even with the Gates fully open. If the Taupo Gates were fully open and discharging about 300m³ per second, and inflows to the Lake were at a minimum, the level of Lake Taupo would reduce by only 2–3 cm per day.

POWER FROM LAKE TAUPO AND THE WAIKATO RIVER



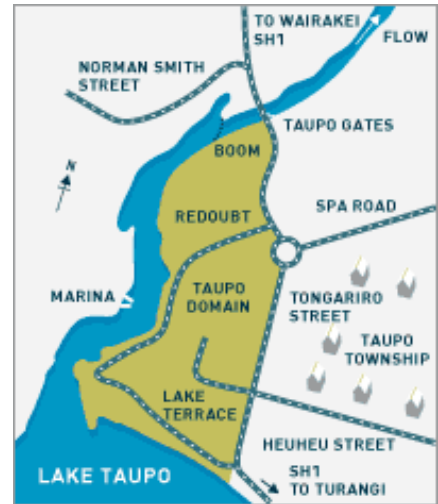
Water that flows from Lake Taupo into the Waikato River is used to generate electricity up to eight times (at different hydro stations within the Waikato Hydro System) before it flows out to sea at Port Waikato. The electricity that Mighty River Power generates from the Waikato Hydro System equates to around 12% of New Zealand's electricity demands.

TAUPO GATES

The Taupo Gates are located just north of Taupo under the State Highway 1 bridge. The gates were constructed during 1940 – 41 and were a vital part of the Government's plan for developing a hydro generation system on the Waikato River.

When the gates were designed, a new, wider river channel was constructed. The new channel meant that the maximum outflow of water could be increased by approximately 1.5 times. Installing the gates meant that the flow of water out of Lake Taupo could be managed.

The volume (amount) of water flowing into Lake Taupo (from rainfall, groundwater, and rivers and streams within the catchment) is the major factor that determines how much water is available for generating electricity. Even when full, Lake Taupo provides only 4 – 6 weeks of storage for generation – this is quite a small amount when compared to South Island Hydro Lakes.

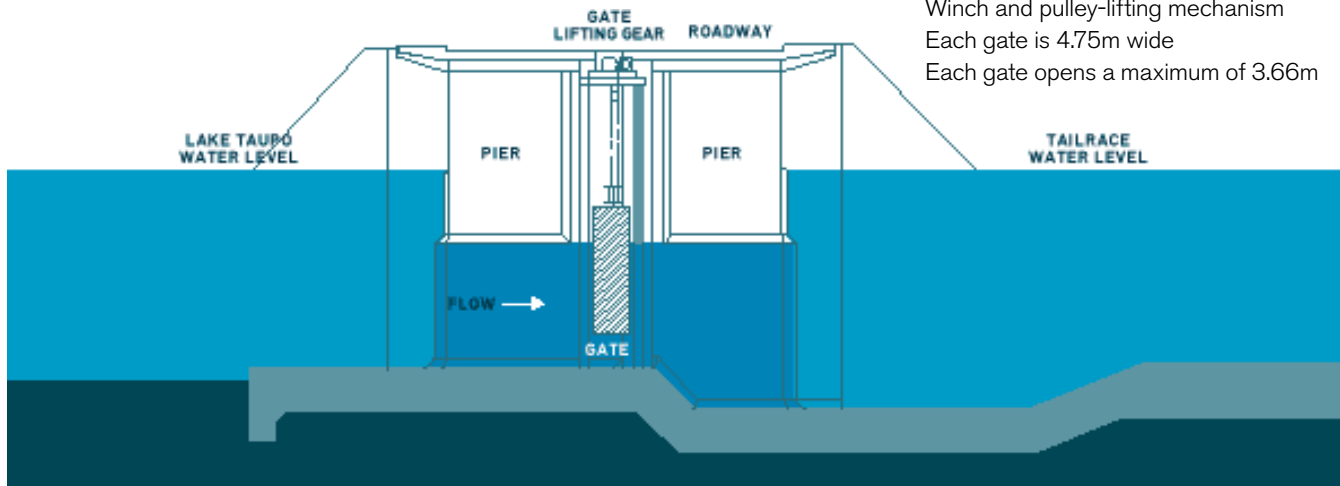


HOW THE TAUPO GATES WORK

Mighty River Power manages the Taupo Gates which control the amount of water flowing out of Lake Taupo into the Waikato River. The gates structure is made up of six vertical concrete gates which can each be operated independently. Mighty River Power controls the gates remotely from its control centre in Hamilton. The gates are opened and shut with a motor driven winch system.

GATE STATISTICS

- 6 Concrete Gates
- Winch and pulley-lifting mechanism
- Each gate is 4.75m wide
- Each gate opens a maximum of 3.66m



THE WAIKATO HYDRO LAKES

Water flows from Lake Taupo into the Waikato River. Mighty River Power manages how that water flows through the eight hydro lakes and nine hydro power stations on the Waikato River. Water that leaves Lake Taupo is stored in the first hydro lake, Aratiatia, before it is channelled through the power station to generate electricity, after which it flows downstream and is stored in the next lake – Ohakuri. This process continues with the water passing through each hydro lake and power station, until it reaches the last station, Karapiro, where it flows downstream and out to sea at Port Waikato.

It is a complicated balancing act, making sure the right amount of water is in the right place at the right time for making power, while working with Mother Nature and also meeting the needs of the communities who use Lake Taupo and the Waikato River.

The Waikato Hydro System that exists today, and the security of electricity supply depends critically on water from Lake Taupo, as no other major sources of water feed the system.