

# APPROACHING ZERO DISCHARGE ON A MODERN MICROFILTRATION DRINKING WATER FACILITY IN NEW ZEALAND

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## ABSTRACT

In May 2008 the township of Hokitika and Westland Milk Products started drinking and using water from a new PALL Microfiltration treatment plant. Lake Kaniere provides the source water which is filtered by the microfiltration membrane system and chlorinated using the existing chlorination system providing treated drinking water for Hokitika and Westland Milk Products. The plant achieves compliance with the Drinking-Water Standards for New Zealand 2005 (DWSNZ 2005) and has a capacity of 7,000 m<sup>3</sup>/day.

The plant site is not connected to the town sewerage system, providing a key challenge for the plant upgrade to economically provide a waste disposal solution. The original treatment process comprised only chlorination and water storage with no need for wastewater disposal. Typical microfiltration systems require about 5% of the feedwater for membrane regeneration which includes backwash and chemical cleans; membrane regeneration would have resulted in approximately 400 m<sup>3</sup>/day of wastewater from the Hokitika plant.

The project was delivered via a lump sum turnkey Design and Construct contract. Various options were considered for wastewater disposal during the tender design phase including traditional settling ponds and construction of a wastewater pipeline for offsite treatment. However, included in the tender from the West Coast Water Joint Venture (WCWJV) was the most cost effective option, the inclusion of a “Wastewater Recovery” microfiltration membrane process. Conservative projections estimated that the Secondary microfiltration system would recover sufficient volumes to reduce the wastewater by about 95% to around 0.2% of the feedwater or approximately 20 m<sup>3</sup>/day. The wastewater is stored on-site until removal via a road-tanker for disposal at the existing municipal wastewater treatment plant.

The Westland District Council agreed with the “Wastewater Recovery” principle as being the most cost effective and backed the WCWJV to achieve the projections provided by awarding the contract. The WCWJV partners are PALL New Zealand and Marshall Projects who delivered and commissioned the plant in 8 months from award.

The “Wastewater Recovery” microfiltration system option had the lowest overall whole of life cost and was constructed as an integral part of the overall microfiltration treatment plant. The commissioned treatment plant utilises two identical Primary microfiltration units; with a single “Wastewater Recovery” microfiltration unit providing an overall plant recovery in excess or 99.8%.

The upgraded treatment plant was commissioned in May 2008. This paper highlights the success in maximising the overall water recovery at the site. Operating data shows the water recovery is greater than projected during the design phase, with the installation achieving a near ‘zero-discharge’ from the water treatment process. The cost benefits for many plants are real and perhaps with some additional innovation, complete on-site treatment could produce value added products?

## KEYWORDS

**Microfiltration, Drinking water, Zero discharge, Waste minimisation**