Yabulu Reuse Plant

(reference site only, no longer operated by TRILITY)

TRILITY

Delivery of advanced water reuse technologies to the resource sector

to solve water discharge and consumption issues

TRILITY designed, built and operated the Yabulu Wastewater Treatment Plant (WWTP) at Yabulu Nickel Refinery, which treated tailings dam wastewater, enabling its reuse in operations at the refinery.

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The wastewater produced through the ore refining process is brackish and is unsuitable for direct reuse. Additionally as the wastewater is stored in lagoons in close proximity to the coast, there was always a risk that contaminated water could overflow and discharge into the environmentally sensitive waters near the Great Barrier Reef.

TRILITY entered into an agreement with BHP to design, build, operate and maintain a wastewater treatment facility to treat saline industrial wastewater generated during nickel refining at the Yabulu Nickel Refinery in Townsville for reuse in refinery operations. In 2005, the agreement was renegotiated into an alliance arrangement with Yabulu Water. Construction of the facility was completed in January 2005.

The Wastewater Treatment Plant (WWTP) combines Micro Filtration (MF) and Reverse Osmosis (RO) technology. Tailings dam wastewater is pre-conditioned for iron removal prior to entering the plant. MF is then used to remove particles larger than 0.2 micron, with mineral salts being removed in a medium pressure RO stage. The pH-adjusted water contains less than one quarter of salts generally found in drinking water and can be used in refining processes. Reject water is diverted to a high pressure desalination stage with energy recovery enabling permeate to join the main process stream, while the waste is concentrated into brine and pumped to a large evaporation pond.

Commissioning of the wastewater treatment resulted in reduced reliance on bore and potable water and eliminated the risk of discharge from overflowing tailings ponds into the Great Barrier Reef Marine Park.

Who

BHP previously operated the Yabulu Nickel Refinery. The refinery processes nickel and cobalt bearing laterite ores purchased from third party mines in New Caledonia, Indonesia and the Philippines.

What

A 10 ML/d WTP combining MF and RO technology, which treated brackish tailings dam wastewater enabling its reuse in operations at the refinery.

Where

Located at the Yabulu Nickel Refinery in Townsville, North Queensland.

Why

TRILITY's solution provided major cost and environmental benefits - with less reliance on borehole water and the risk of discharges being eliminated.

Snapshot

Client	BHP
Type of Contract	Design, Build, Operate (DBO) which then transferred to an Operations and Maintenance (O&M) Alliance
Facilities	Industrial wastewater reuse plant
Technology	Micro Filtration and Reverse Osmosis
Design Capacity	10 ML/d
Term	10 years (now complete)
Capital Cost	c. $24m

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