FIRST-CLASS HIGH RECOVERY FOR ENHANCED WATER SAVINGS

CUSTOMER
Mekorot, Israel's National Water Company

LOCATION
Shafdan

PROJECT TYPE
Wastewater RO desalination

COMMISSIONED
2014

CAPACITY
180 m^3/day

STATUS
Operational

OVERVIEW

The Dan region wastewater treatment plant at Shafdan is a complex, inter-regional plant that collects, treats and reclaims municipal wastewater in high density urban areas and industrial zones, recycling it into water for unlimited use in agricultural irrigation. Based on Rotec's renowned proprietary Flow Reversal (FR) technology, the FP-7 European Union Venture asked us to participate in the flagship industry-first project as part of the consortium, which included distinguished European water companies such as: Veolia, Thames Water, KWR, Dow, Berlin Waser, together with Mekorot as the Israeli partner.

The plant demonstrated Flow Reversal Technology's ability to achieve continuous, ultra-high recovery of 90% via municipal wastewater reuse treatment.

Moreover, due to our forward-thinking FR, valuable footprint required for a tertiary wastewater treatment can be reduced, enabling this outstanding membrane technology to become the preferred and most viable alternative in the market.

THE NEED

The main goals of the Shafdan plant were minimizing environmental pollution, preventing the discharge of raw sewage into rivers and the sea and preserving Israel's water sources through appropriate effluent treatment and highly efficient reuse. Mekorot – Israel's National Water company, needed to treat the Shafdan wastewater effluent stream from municipal processes at a recovery rate higher than 85%.

THE PROCESS

Design, installation of a new RO system for wastewater secondary effluent, comprised of 2 stages with remote engineering support. Implementing the novel Flow Reversal technology enabled reversing the flow between the pressure vessel (PV) in stage 2 with the one in stage 1. Flow Reversal was essential in preventing biofouling growth and mineral scaling (mainly Calcium Phosphate and Carbonate) on the membrane surface, demonstrating efficiency at high system recovery of 90%.

The main challenges in treating this wastewater effluent stream as demonstrated by the customer's previous conventional RO systems were operational problems involving high CIP frequencies (biofouling growth), high acid consumption and limited recovery up to 80%.

THE RESULT

Eco-Friendly Water Savings

The ROTEC system has been operating successfully at the Shafdan plant, delivering **90% recovery,** the highest performance for a 2-stage RO system, and **zero** CIP, unprecedented in high-recovery wastewater reuse. **It also led to a 50% reduction in chemical consumption** vs. conventional RO systems.

The plant achieved ultra-high recovery with smooth operation, no downtime or CIP cleaning – cutting chemical consumption by half, while significantly reducing OPEX.

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