



END[®] Technology

CASE STUDY

Cutting Edge Treatment Process Paves the Way for Permit Compliance at California WWTP

THE CHALLENGE

Discharge permit limitations, governed by the National Pollutant Discharge Elimination System (NPDES) or other local control boards, are often updated to expand protection for downstream ecosystems and users.

MI Systems was approached by a Municipal WWTP in Southern California in violation of their Regional Water Quality Control Board's recently tightened discharge limits. Chloride (Cl⁻) concentrations now consistently exceeded a maximum threshold of 100.0 milligrams per liter (mg/L) in their secondary effluent.

Brine management for any solution was critical. The rural, inland location for this facility offered limited options for wastewater disposal and conventional treatment, including membrane filtration and ion exchange. These alternative solutions would not only be expensive to buy and operate, but would be unable to meet the new restrictions without generating significant volumes of waste.

THE SOLUTION

After the WWTP compared several different treatment processes, MI Systems was asked to design a solution to the problem. **END[®] Technology**, an NSF 61-G certified, next-generation electrochemical-desalination process, was recommended for its ability to meet multiple NPDES contaminant limits with minimal brine volume generation and low operating cost. Effective chloride removal was demonstrated at the facility during a successful pilot of the technology prior to a full scale project build out.



END[®] Technology Demonstration System

CASE STUDY - PILOT SYSTEM RESULTS

Customer	Southern California WWTP
Industry	Municipal Public Works
Application	Wastewater Desalination
Solution	MIS END [®] Technology
Raw Water Source	Secondary Effluent
Discharge Limitation	MAX 100.0 mg/L Cl ⁻
END[®] Feed Quality	187.0-200.0 mg/L Cl ⁻ 1,364.0 mg/L TDS
END[®] Product Quality	55 mg/L Cl ⁻ 597 mg/L TDS (Tuned)
END[®] Feed Flow	10 GPM
END[®] Brine Flow	0.4 GPM (Averaged)
END[®] Specific Energy Consumption (SEC)	0.5 kWh/m ³
Disposal Type	Future Evaporation Pond
Facility Size	0.5 MGD
Waste Volume	4%
Overall Recovery	96%

Water for Industry. Water for People.

High recovery solutions for every drop.

Automated polarity reversal provides a 'Self-Cleaning' flush of scale-forming ions and other foulants for robust, high-performance operation.

END[®] Technology transforms EDR via advanced electrode, membrane, and spacer materials and improved membrane and cell geometry. These breakthroughs improve salt rejection, reduce energy consumption, and lower the maintenance requirements of an already well-proven process.

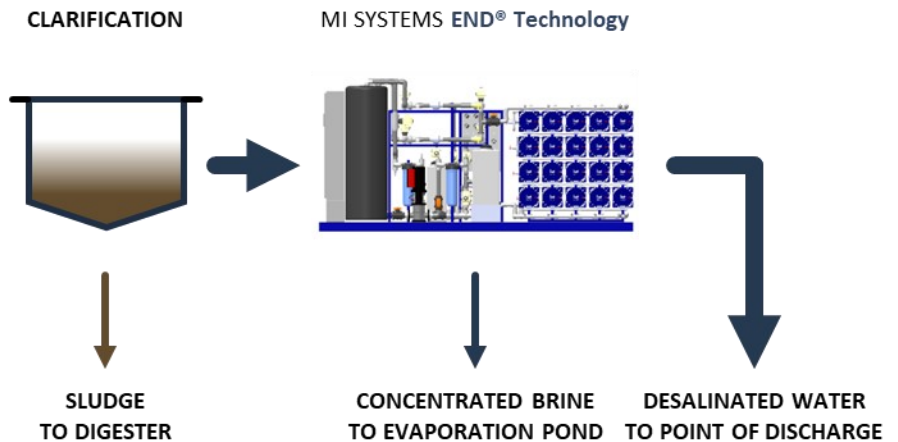
The MI Systems END[®] Technology pilot demonstration provided the Southern California WWTP with a high-performance, NSF-61 certified solution to meet updated permit restrictions. The process was designed to recover at least 95% of the client's wastewater volume with minimal noise, energy consumption, and maintenance, and will enable on-site brine management using a small evaporation pond - an option not possible with conventional desalination methods.

THE RESULT

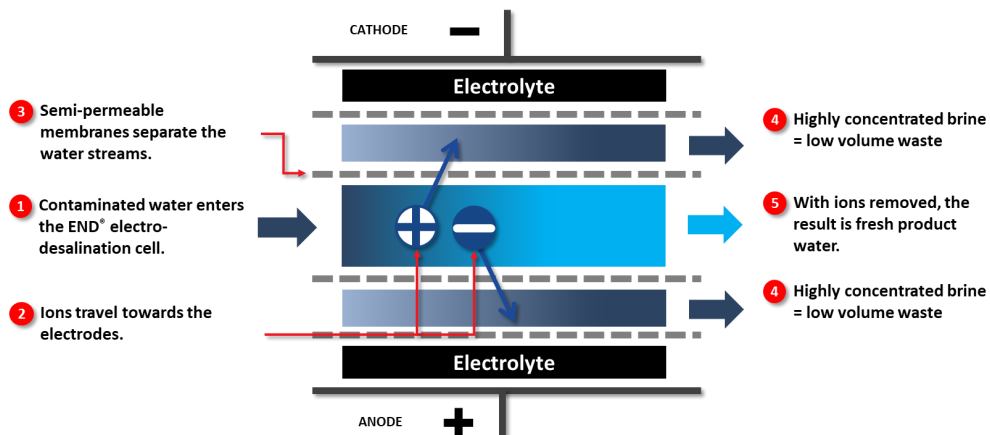
Piloting END[®] Technology validated effective chloride removal to below the 100.0 mg/L permit limitation while operating at 96% overall recovery and consuming only 0.5 kWh per cubic meter of product water, surpassing the performance of other competitive high-recovery processes.

A planned 200.0 GPM full-scale system will expand on the successful pilot demonstration of the WWTP's secondary effluent. Upon start-up, the WWTP will be in compliance with their chloride discharge limit, having done so without sacrificing water recovery or significant energy.

To learn more about MI Systems, END[®] Technology, or municipal and industrial wastewater applications please visit <http://www.magnaimperiosystems.com> or contact info@m-i-systems.com.



END[®] Process Skids combine next-generation electrochemical desalination with advanced automation, energy saving pumps, and integrated Clean-In-Place (CIP).



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