

GE Reduces TDS in Municipal Effluent So It Can Be Used for Irrigation in the Canary Islands



Challenge

The Canary Islands, Spain are seven volcanic islands that have an economy that is based heavily upon tourism and agriculture. With the demands for water rapidly growing, there are limitations – both in quantity and quality – on the fresh water available for irrigating golf courses and critical island crops such as bananas. Municipal effluent from the local sewage treatment plants was available as a water source for banana irrigation. The challenge was that the salinity, including sodium and chloride, was too high and desalting is required.

Solution

The alternatives considered for this desalting application were Electrodialysis Reversal (EDR) and Reverse Osmosis (RO). In the volcanic Canary Islands, with approximately 55 mg/l of silica in the water, EDR was selected as the best technology because it could achieve a much higher water recovery than RO as it does not reject or concentrate silica. In addition, EDR has lower pretreatment requirements than RO and has a proven track record in desalinating difficult-to-treat wastewater. Sand filtration was sufficient pretreatment for the EDR, whereas an RO system would have required additional investment, like MicroFiltration (MF) as pretreatment.

Results

Today there are a number of large EDR plants in operation in the Canary Islands. These plants include a 1 million gpd (4000 m³/day) EDR plant installed in 1996, which was expanded to double the size in 1999. It was expanded again to 3 million gpd (12,000 m³/day) in 2002, as well as, a 370,000 gpd (1400 m³/day) EDR plant installed in 1998.

A large percentage of the farmers in the Canary Islands are using water from the reliable, cost effective EDR plant. From the Canary Islands to California, GE Water & Process Technologies continues to demonstrate its strong capabilities in the area of water reuse for agricultural purposes. Table 1 summarizes the Canary Island projects

Table 1: Project Summary for Canary Island

End-User:	BALTEN , a company owned by Cabildo Insular, the local government of Tenerife Island	Farmers Cooperative
Location:	San Lorenzo Valley, Tenerife, Canary Islands, Spain	Cardones, Gran Canaria, Spain
Commissioned:	1996; Expanded in 1999 and in 2002	1998
Feed Water Source:	Municipal effluent	
Application:	Irrigation of banana plantations and golf courses	
Feed Water Quality:	1290 ppm (mg/L) TDS	1600 mg/l TDS
Product Quality:	Phase 1: 380 mg/l TDS; Phase 2: 280 mg/l TDS	400 mg/l TDS
Water Recovery:	86%	85%
Capacity:	12000 m ³ /day (3.15 mgd)	1400 m ³ /day (370,000 gpd)

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Global Headquarters
Trevose, PA
+1-215-355-3300

Americas
Watertown, MA
+1-617-926-2500

Europe/Middle East/Africa
Heverlee, Belgium
+32-16-40-20-00

Asia/Pacific
Shanghai, China
+86 (0) 411-8366-6489