

Benidorm Wastewater Treatment Plant

Application: Tertiary treatment with ZeeWeed* 1000 membranes for reverse osmosis (RO) pre-treatment and reuse

Capacity: 8.8 MGD (33,300 m³/d)

Location: Benidorm, Alicante, Spain

Commissioned: June 2006



Challenge

Benidorm is a coastal town located in the province of Valencia, Spain, by the Mediterranean Sea. It is considered one of the most populous cities in the province with the population increasing significantly during the summer tourist season.

Potable water is a very limited resource in Spain. For this reason, the Regional Government of Valencia (Spain) decided to investigate the use of treated wastewater as a source of irrigation water in order to free up potable water for the city's inhabitants and visitors.

Solution

In April 2003 the Regional Government of Valencia (Spain) awarded DRACE the Design and Construction Contract for the Benidorm Tertiary Wastewater Treatment Plant (WWTP), in Valencia, south-eastern Spain.

The process would consist of ultrafiltration (UF) membrane pretreatment treating municipal effluent plus a reverse osmosis (RO) membrane desalination stage, enabling the production of desalted water to be used as an irrigation resource.

Following a successful pilot study, both the Regional Government of Valencia and DRACE selected ZENON Membrane Solutions, part of GE Water & Process technologies, to supply a ZeeWeed UF membrane system to treat secondary effluent and produce high quality water that could be sent directly to downstream RO units.



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Process Overview

Clarified secondary effluent enters the ZeeWeed membrane tanks containing ZeeWeed immersed membranes. With a nominal pore size of 0.02µm, the ZeeWeed membrane acts as a physical barrier to suspended solids and waterborne pathogens.

The ZeeWeed UF system consists of six individual membrane trains to meet the required throughput capacity. Future expansion of the system can be achieved by adding identical trains.

Filtration is achieved by pulling the water through the hollow fiber membranes at a pressure between -1 and -10 psi (-6.9 to -69 kPa).

Once drawn through the lumen of the fiber, the treated permeate is discharged to feed the downstream RO units, or blended with the RO permeate to provide some dissolved solids to the irrigation water, or discharged to the Mediterranean Sea if there is more UF capacity than irrigation demand.

Discharge Requirements	
	Treated Water
Turbidity (NTU)	< 0.1
BOD (mg/L)	< 3
TSS (mg/L)	< 0.5
SDI	< 3