



# Reusing Wastewater on Fuerteventura Island

1/3



Puerto del Rosario

## Data on the tertiary treatment in Puerto del Rosario

Location	Fuerteventura
Customer	Ministry of the Environment
Start-up date	November 2005
Duration	36 months
Capacity	3.000/ 2.000/ 1.500 m <sup>3</sup> /día
Technology	Advanced Technology and Electrodialysis
Water quality	DBO < 10ppm SS < 10 ppm TSD < 450 ppm Conductivity < 750 µs/cm

In addition to the need to treat the wastewater from Puerto del Rosario, Tuineje and La Oliva on the island of Fuerteventura, the scarcity of water made it convenient for **DRACE medioambiente** to include in the project infrastructures for regenerating and reusing the treated water making the plant a source of regenerated water of guaranteed quality.

The main element of this job was the purification processes, the tertiary treatments using two stage fluidized sand filters followed by a desalination process with reversible electro dialysis.

Daily flow	3,000 m <sup>3</sup> /day
Regulation Tank	Volume: 646 m <sup>3</sup> Retention time: 5.2 hours
No. of filter lines	3
No. of filters per line	2
Characteristics of the first filter	Diameter: 2.50 m Height: 5.70 m Type of sand: Silica Grain size: 1.2 mm Filtering speed: 8.5 m <sup>3</sup> / m <sup>2</sup> x h
Characteristics of the second filter	Diameter: 2.50 m Height: 4.70 m Type of sand: Silica Grain size: 0.80 mm Filtering speed: 8.5 m <sup>3</sup> / m <sup>2</sup> x h
Microfiltration recovery rate	97%
Microfiltered water tank	Volume: 373 m <sup>3</sup> Retention time: 3 horas
No. of reverse electro dialysis lines	4 units
No. of stacks per line	2 units
Hydraulic flow per stack	31,25 m <sup>3</sup> /h
Reduction in salts per stack	50%
Reverse Electro dialysis recovery rate	85%

# Reusing wastewater on Fuerteventura Island

2/3



## Data on the tertiary treatment in Gran Tarajal

Daily flow	1,500 m <sup>3</sup> /day
Regulation Tank	Volume: 453 m <sup>3</sup> Retention time: 7.3 hours
No. of filtration lines	2
No. of filters per line	2
Characteristics of the first filter	Diameter: 2.50 m Height: 5.70 m Type of sand: Silica Grain size: 1.2 mm Filtering speed: .4 m <sup>3</sup> / m <sup>2</sup> xh
Characteristics of the second filter	Diameter: 2.50 m Height: 4.70 m Type of sand: Silica Grain size: 0.80 mm Filtering speed: 6.4 m <sup>3</sup> / m <sup>2</sup> xh
Microfiltration recovery rate	97%
Microfiltered water tank	Volume: 173 m <sup>3</sup> Retention time: 2.86 horas
No. of Reverse Electrodialysis lines	2
No. of stacks per line	2
Hydraulic flow per stack	31.25 m <sup>3</sup> /h
Salts reduction per stack	50%
Reverse Electrodialysis recovery rate:	85%

## Data on the tertiary treatment in Corralejo

Daily flow	2,000 m <sup>3</sup> /day
Regulation Tank	Volume: 518 m <sup>3</sup> Retention time: 6.22 hours
No. of filtration lines	2
No. of filters per line	2
Characteristics of the first filter	Diameter: 2.50 m Height: 5.70 m Type of sand: Silica Grain size: 1.2 mm Filtration speed: 8.5 m <sup>3</sup> / m <sup>2</sup> xh
Characteristics of second filter	Diameter: 2.50 m Height: 4.70 m Type of sand: Silica Grain size: 0.80 mm Filtering speed: 8.5 m <sup>3</sup> / m <sup>2</sup> xh
Microfiltration recovery rate	97%
Microfiltered water tank	Volume: 178 m <sup>3</sup> Retention time: 2.2 horas
No. of Reverse Electrodialysis lines	3
No. of stacks per line	2
Hydraulic flow per stack	27.78 m <sup>3</sup> /h
Salts reduction per stack	50%
Reverse Electrodialysis recovery rate	85%

# Reusing Wastewater on Fuerteventura Island

3/3



Tertiary filters at Puerto del Rosario

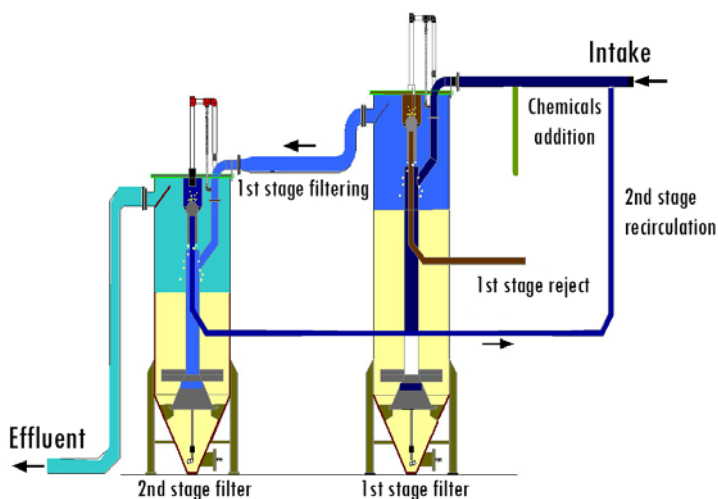


Reverse Electro dialysis stacks at Puerto del Rosario

## Microfiltration system in sand filters

The microfiltration systems included have a two stage process involving continuous sand filtration in which the sand used is constantly washed.

The installation consists of metal tanks containing the sand bed that serves as a filtering medium through which the wastewater passes emerging from the upper part of the filter as clean water. At the same time, the sand is removed from the bottom of the filter and after it has been cleaned it is returned to the top part of the sandy bed. A small part of the filtered water is used to clean the sand and leaves the filter as reject.

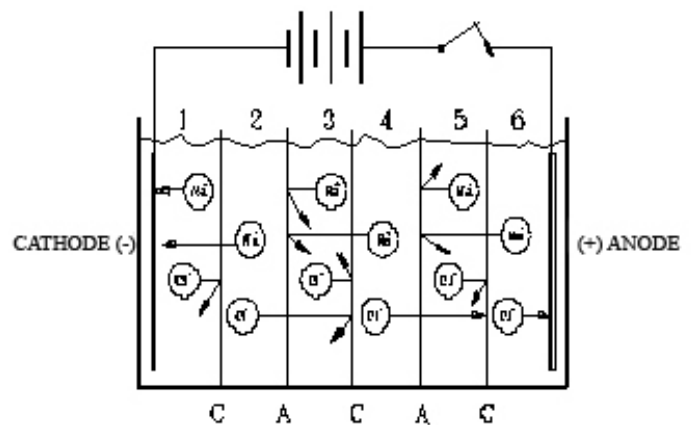


Fluidized sand filter installation diagram

## Reverse Electro dialysis system

The tertiary treatment system described is completed with a desalination system using reverse electro dialysis.

Electrodialysis is a process of electrical-chemical separation, in which the ions are transferred through ionic exchange membranes by using direct electric current.



Reverse Electro dialysis functioning principle