

PROJECT PROFILE SERIES #45

Seawater Reverse Osmosis System for Supplying Potable Water for Airport in Saudi Arabia

The Background

Saudi Arabia General Authority of Civil Aviation (GACA) is responsible for constructing, managing, operating, and maintaining airports and air navigation infrastructure in Saudi Arabia.

The city lacked adequate water production and distribution systems around the airport. GACA's objective was to increase water production to meet projected growth in demand, and wanted to outsource to a private investor the setting up of the desalination plant for the production and provision of potable water. Qatarat Saqiya was formed as the entity that would construct the plant and in turn supply water to the Authority of Civil Aviation. Aquatech along with the local consortium partners were successful in the competitive bidding process for setting up the SWRO plant.



The filtered water is then treated through SWRO followed by BWRO with adequate blending to give permeate water suitable for further treatment in Potabilization system

The Facility

The desalination plant based on Reverse Osmosis Technology is designed for producing Potable water from the seawater in Jeddah. The raw seawater is first screened and then treated for removal of Suspended Solids/Turbidity etc in filtration units followed by micron filtration.

The Solution

Aquatech designed and built a plant, structured on BOOT basis that makes 30,000 m³/day of Potable Water. The system consists of the following:

1. Seawater Intake Screening
2. Multi Media Filtration
3. Micron Filtration
4. High Pressure Pump with Energy Recovery Device
5. 1st Pass Reverse Osmosis
6. 2nd Pass Reverse Osmosis
7. Potabilization Unit
8. Chlorination Unit

The desalination plant has been successfully commissioned and is designed for a recovery of 45% on the 1st pass SWRO and the 2nd Pass BWRO operates at a recovery of 90%. The plant has been designed on a feed TDS of 40,900 ppm and the treated water is as per WHO standards for potable water.



PROJECT PROFILE SERIES # 45

DESIGN WATER ANALYSIS

	Inlet	Outlet		Inlet	Outlet
Turbidity, NTU	<1	N/A	Chloride, ppm	22050	<200
Color, PCU	<5	N/A	Sulfate, ppm	3347	<50
TDS, mg/l	40900	<400	Nitrate, ppm	3.0	<1
Calcium, ppm	545	5-50	Fluoride, ppm	2.36	<1.5
Magnesium, ppm	1527	-	pH	8.1	7.5-8.5
Sodium, ppm	12200	<150	Temperature °C	24-32	-
Bicarbonate, ppm	143	<50			

PROCESS FLOW DIAGRAM

