

## Sea Water Reverse Osmosis Plant - Hurghada City, Red Sea Governorate, Egypt

### A Case Study



### Key Data

Location	Hurghada City, Red Sea Governorate, Egypt
Plant Type	Sea Water Reverse Osmosis (SWRO)
Capacity	80,000m <sup>3</sup> /day
Use	Potable Water Supply
Client	Ministry of Defense - Engineering Authority, Water Department
End User	National Organization for Potable Water and Sanitary Drainage
Contract Type	Design and Build on a Turnkey Basis including O&M

### Introduction

Due to Egypt's scarce water resources, and the rising demand between the supply and demand of water, the country is embarking into a strategic direction to capitalize and further focus on seawater desalination as a key source for municipal water supply, particularly for coastal areas.

Accordingly, the Egyptian Government has launched the Al-Yosr project in the city of Hurghada, Red Sea Governorate, to construct a Seawater Reverse Osmosis Desalination Plant with a capacity of 80,000m<sup>3</sup>/day to produce water with potable standards for drinking purposes to serve the city and a population of more than 500,000 residents.

Merito was awarded the project based on its extensive engineering experience and history with developing desalination projects and its world class quality process design, construction, operation and maintenance of plants utilising the Reverse Osmosis technology.

As part of the mandate set by the Egyptian Government, Al-Yosr SWRO plant was realised as the first large SWRO in Egypt.

### Scope of Work

The scope of work included:

- Detailed engineering for the full plant which included: intake works, civil works, process and electrical works and delivery of all equipment, material, and spare parts
- Installation, commissioning and startup
- Onshore & offshore Training
- Full operations and maintenance

The plant consists of:

- Raw water intake system
- Chemical pre-treatment
- Multi-Media Filtration
- Micron Filtration
- Desalination with Double Pass Reverse Osmosis System
- Energy Recovery System (by Isobaric Pressure Exchangers)
- Post Treatment – Langelier Saturation Index adjustment by:
  - Lime stone Contactors
  - CO<sub>2</sub> Injection System
  - Degasser with Blending Tank and Pump station
- Water treatment laboratory
- Stand-by generators covering 50% of plant capacity
- Step-down transformers and substation
- Medium and low voltage distribution system
- Instrumentation, controls, and SCADA system







## Key Benefits

- A comprehensive solution: Al-Yosr SWRO is a total solution for the potable water shortage crisis in the city of Hurghada and a progressive approach aimed at coping with the expected future growth in population and demand.
- Economic viability: Al-Yosr is a large reverse osmosis plant that is in-line with Egypt's strategy to utilize seawater desalination for the supply of municipal water in remote coastal areas. This solution offers a more economically viable alternative for water provision compared to using transfer pipelines extended for over 200km from the Nile River.
- Trouble free operation: Utilizing novel and reliable technology and integrating it across the design of the plant lead to minimum downtime and more sustainable operations.
- Energy Savings: Utilising state of the art technology in energy recovery lowers the plant energy consumption and carbon footprint to a minimum.

- Safe and clean water supply: Product water remineralization systems ensure the supply of high quality water to consumers as well as protect the city water distribution pipe grid.

The treated water quality meets international standards and the most stringent requirements for potable water achieving permeate water with Boron levels less than 0.5 mg/l.

