

## Seawater Desalination Plant for The Pearl- Doha, Qatar

### A Case Study



### Key Data

Location	The Pearl – Doha, Qatar
Plant Type	Seawater Desalination Plant
Capacity	SWRO 40,000 m <sup>3</sup> /day - BWRO 35,000 m <sup>3</sup> /day
Use	Supply water for potable, district cooling & irrigation purposes
Client	United Development Company (UDC)
End User	United Development Company (UDC)
Contract Type	Design, Supply, Installation, Commissioning and Operation and Maintenance of the Seawater Reverse Osmosis Plant, Seawater Intake and Brine Outfall Works.

Due to the reclaimed nature of the land and its prime value, it was not permitted to construct a plant with conventional horizontal layout and this constituted a major challenge. To overcome this challenge, Metito adopted an effective, sustainable and practical solution; building a multi story structure comprising 4 levels:

- Basement floor: This stands at below seawater level where the filter feed pumps, pressure filters, product water pumps, irrigation transfer pumps, filter backwash pumps and air scouring blowers, are all housed
- Ground floor: Home to the cartridge filters, chemical conditioning systems, and carbon dioxide storage and injection system
- Mezzanine Floor: Houses the MCCs and LV systems
- First floor: This houses the high pressure pumps for 1<sup>st</sup> and 2<sup>nd</sup> passes, energy recovery turbochargers, 1<sup>st</sup> and 2<sup>nd</sup> pass membrane racks, control systems and 3.3 KV HV MCC for the huge 1<sup>st</sup> pass high pressure pumps

Another challenge was ensuring the treated water permeate salinity is less than 400ppm, in compliance with the local water quality standards. To overcome this challenge, Metito utilised the 2 pass RO system.



### Introduction

The Pearl Qatar is an iconic and innovative mixed-use urban development in Doha, Qatar. The Pearl is owned and developed by United Development Company (UDC), a Qatari shareholding company with a mission to identify and invest in long-term projects contributing to Qatar's growth. The island spans over four million square-meters of land that was meticulously developed into a masterpiece of private and modern living. The Pearl offers residents and visitors a complete lifestyle experience that includes residential units built to the highest international standards, a fantastic choice of retail, dining and hospitality outlets and a host of other amenities and facilities.

The Pearl's first phase and gateway to the island also houses the world's longest waterfront luxury retail walkway, the 3.5km marina-front pedestrian boardwalk called 'La Croisette'. UDC awarded Metito the project to construct a Seawater Reverse Osmosis (SWRO) desalination plant to supply water for potable purposes, district cooling and irrigation with a flow capacity of 40,000 m<sup>3</sup>/day.



## Scope of Work

The scope of work included design, engineering supply, installation and commissioning, and operation of the SWRO plant which required the following:

- Two travelling band screens for seawater intake
- Chemical conditioning for disinfection and coagulant dosing
- Six filtration forwarding pumps to feed the disinfected water to the pressure sand filters
- A total of 15 horizontal multimedia pressure sand filters to separate fine suspended particles and colloidal particles
- Pre-treatment through antiscalant and dechlorination agent dosing
- First pass SWRO plant and second pass Brackish Water Reverse Osmosis plant
- Post-treatment using chlorine, lime and CO<sub>2</sub> injection
- Brine outfall pipeline
- Installation of two concrete seawater intake heads including coarse sea level

## Key Benefits

### Financial Benefits

- An efficient design that takes into consideration the stringent requirements laid down by the owner and the consultant, and that saves on the cost of prime land that would have been alternatively required to build a horizontal plant instead of multi story structure

### Environmental Benefits

- Practical measures have been taken to preserve marine life and the surrounding environment after conducting an Environmental Impact Assessment study to assess the area affected by the construction and operation of the plant, and thereby develop the required measures to minimize environmental impacts
- The technologies used reduce the eco footprint of the plant as they are integrated using low carbon emission equipment such as turbo chargers which are able to recover energy from brine