



Case Study: Challenged SWRO Plant

Public Utility Board's Tuas Testbedding Facility - Singapore

Installation Date: October, 2020



Challenge:

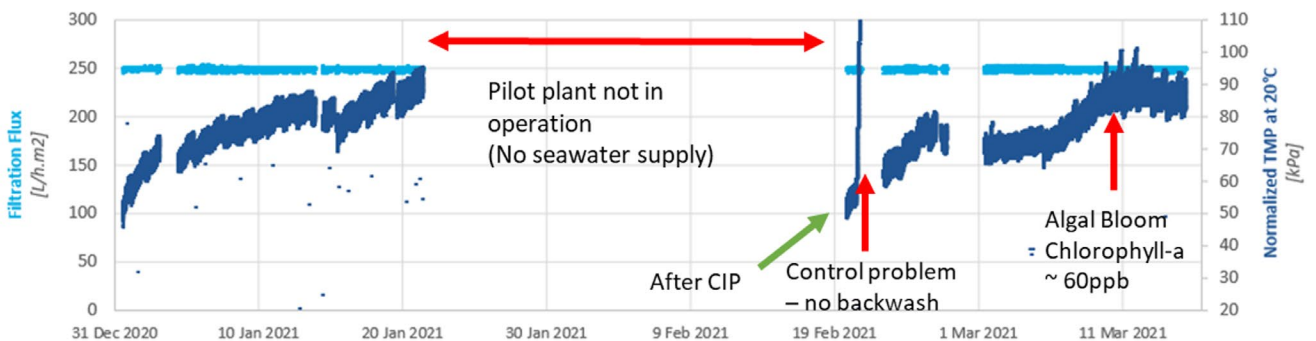
- Unreliable SWRO pretreatment necessitating multiple pretreatment steps (DAF, DMF, Polymeric UF)
- Variable seawater quality causing plant shutdowns
- Inadequate pretreatment requiring frequent SWRO cleans
- Expensive combination of processes



Nanostone Solution

- Dependable, uninterrupted pretreated water with a single step
- Operates through algal blooms with no downtime, no intervention
- Dependable, consistently high quality feed to SWRO
- Lowest cost of ownership available

Operated through algal blooms with no change to operational parameters or water quality



Key Pretreatment Water Quality Parameters	
SDI	2.0
Turbidity	<0.05 NTU
TOC Removal	30-70%
UVT	98%

Key Operational Parameters	
Flux	250 LMH
Recovery	98%
Uptime*	97%
Estimated CIP Frequency	90 days



Desalination Pretreatment



Problems We Solve

Reverse osmosis (RO), the state-of-the-art technology for seawater desalination, performs well over extended periods so long as the feedwater is largely free of suspended solids and low in dissolved organics.

However, existing pre-treatment technologies supplying RO systems struggle when exposed to high levels of dissolved organics, harmful algae blooms, and other sudden and variable influxes of suspended solids. When this material passes the pre-treatment system RO fouling increases drastically, reducing plant

capacity, increasing cleaning cycles and chemical consumption and causing premature RO membrane failure.

For developers, owners and operators, these problems result in:

- Reduced plant utilization, which severely impacts plant economics;
- Elevated risks of operational disruptions; and
- Higher treatment costs



Nanostone Water's Value Proposition

Nanostone Water's ceramic desalination pretreatment system removes harmful algal blooms, suspended solids and high levels of dissolved organics from seawater with high reliability, enabling RO desalination systems to operate to rated capacity and planned costs over an extended life. Our single-step solution also eliminates multiple pretreatment processes, reducing capital expense and footprint.

Markets We Serve

Nanostone Water's ceramic desalination pretreatment in the Middle East and Asia integrates our solutions into greenfield desalination plants. Our solutions also retrofit into under-performing plants currently in operation.

SEAWATER DESALINATION PRE-TREATMENT

