

Summary of **SilentAlarm**[™] Plant References

(Partial List)

The following is a partial list of membrane plant installations worldwide where the innovative **SilentAlarm**[™] **SMART** membrane system fouling and performance monitoring and optimization technology and software systems have been licensed, used, installed and/or independently tested, including plants for which the membrane system's performance and fouling history have been evaluated or monitored (either on-site or in-house) using actual plant operating data & membrane system design parameters:

1. E.I. Dupont's *Permasep*[®] Products RO plants in the Middle East/Arabian Gulf and US Research facilities, 1998 – Testimonial letter, issued by DuPont's *Permasep*[®] Products following the conclusion of the 9-month evaluation and testing in the Arabian Gulf and US Research Facilities, agreed with our conclusion that **MASAR**[®] is "an excellent to monitor plant performance and capable of providing an early warning if membrane fouling is occurring", and recommending its use of the **SilentAlarm**[™] software technology at RO plants employing DuPont membranes. Copy of letter is available on masar.com or upon request.
2. Penneshaw Seawater RO Plant (300 m³/day capacity with Koch spiral membranes), South Australia Water Corp., Adelaide, Australia. Case study about using the at this pilot was presented at and published by the International Desalination Association's World Congress on Desalination and Water Reuse ("*Design, Operating and Research Experience at the Penneshaw Seawater Desalination Plant, South Australia*", Pelekani, et al, Grand Canaries, Spain, 2007). Copy of paper available upon request.
3. Abqaiq Brackish RO Plant (9,000 m³/d capacity with Toray spiral membranes), Abqaiq, Saudi Aramco, Saudi Arabia, the largest oil producer and currently the most valuable company in the world.
4. Abqaiq Brackish RO Plant 500 (Upgraded 17,500 m³/d capacity with Hydranautics and Toray spiral membranes), Abqaiq, Saudi Aramco, Saudi Arabia, the largest oil producer and currently the most valuable company in the world.
5. Business Case, SWRO Plant (12,000 m³/d single-pass capacity with Hydranautics spiral membranes), ABB Global Water Initiative-ISI.
6. Al Jubail Seawater RO Plant (91,000 m³/d capacity with Dupont hollow fiber, and Toray & Toyobo spiral membranes), SWCC (Saline Water Conversion Corporation), Jubail, Saudi Arabia, the largest producer of desalinated water in the world.
7. Port Hueneme Demonstration Recycling Facility, brackish RO and Nanofiltration Trains (5,700 m³/d capacity with Dow Filmtec[®] spiral membranes), California, USA. Plant case study was presented at and published by the World of Water[™] Conference, Las Vegas, Nevada, USA, 2001 - "*Real-time Membrane Fouling Monitoring – A Case History*". Copy of paper available upon request.

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8. Riyadh Water & Sewage Authority's 6 Riyadh Region Brackish RO Plants: Salboukh, Manfouha I & II, Shemaisi, Malaz (160,000 m³/d design capacity with Dupont's hollow-fine fiber membranes) and Buwaib (46,800 m³/d design capacity with Osmonics' spiral membranes). The **SilentAlarm**[™] was effectively specified by RWSD as the only system proven to perform "*special calculations to measure the Fouling Index as a function of plant's operating conditions and elapsed time*" - Al Shumaisi RO Plant's Refurbishment Contract, Technical Specifications, General Conditions (page 63).
9. Major IWP SWRO Plant (280,000 m³/d double-pass capacity, 11+1 Dow FilmTec[®] SWRO Racks with DMGF pretreatment schemes), under multiple plant insurance claims investigation, Private client.
10. Al Fujairah Seawater RO Plant – F1 (190,000 m³/d double-pass capacity with Hydranautics spiral-wound membranes), SembCorp ADWEA (Abu Dhabi Water & Electricity Authority), Fujairah, UAE.
11. Al Fujairah Seawater RO Plant – F2 (136,500 m³/d double-pass capacity with DAF+ DMGF pretreatment schemes), Veolia for ADWEA (Abu Dhabi Water & Electricity Authority), Fujairah, UAE.
12. DESAL G Seawater RO Plant (25,000 m³/d double-pass capacity with DMGF pretreatment), DEWA (Dubai Water & Electricity Authority), Jebel Ali, UAE.
13. Al Hamriyah Seawater RO Plant (90.900 m³/d double-pass capacity with DAF+ UF pretreatment schemes), SEWA (Sharjah Water & Electricity Authority), Fujairah, UAE.
14. Al-Taweelah SWRO Pilot Plant (2.7 m³/hr double-pass capacity with DMF and UF pretreatment schemes), ONDEO Degrémont (Suez) for ADWEA (Abu Dhabi Water & Electricity Authority), Fujairah, UAE.
15. Floating Barges IWP SWRO Desalination Plant (2X25,000 m³/day double-pass capacity with UF pretreatment), ACWA Power/NOMAC, Saudi Arabia.
16. Shuqaiq IWPP SWRO Plant (212,000 m³/day double-pass capacity with Toray membranes), ACWA Power/NOMAC, Shuqaiq, Saudi Arabia.
17. Shuaiba III Expansion IWPP SWRO Plant (150,000 m³/day double-pass capacity with Toray membranes), ACWA Power/NOMAC, Shuaiba, Saudi Arabia.
18. Seawater RO Plant (50,400 m³/d capacity with Toyobo hollow-fine fiber membranes), MARAFIQ, Yanbu, Saudi Aramco, Saudi Arabia.
19. Brackish RO Plant (160,000 m³/d capacity with Hydranautics spiral membranes), Saudi Arabia.
20. Gabes Brackish RO Plant (22,500 m³/day capacity with Toray spiral-wound membranes), SONEDE, Tunisia.
21. Pembroke Seawater RO Plant (54,000 m³/d capacity with Dupont hollow fiber membranes), MDS (Malta Desalination Services), Malta.

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22. Industrial Wastewater RO Plant (30,000 m³/d capacity with Dow Filmtec[®] spiral membranes), SUT Sakra Pte., Singapore.
23. Ras Abu Jarjur High-brackish 3-stage RO Plant (52,500 m³/d capacity with Dupont's hollow fine fiber membranes), Bahrain.
24. Clifton Brackish Nanofiltration Plant (9,000 m³/d capacity with Osmonics' spiral membranes), Colorado, USA.
25. Brackish RO Plant – 4 Arrays (264 gpm capacity with Koch Fluid Systems' spiral membranes), USA.
26. Burrton Brackish Pilot RO Plant (6 gpm capacity with Koch Fluid Systems' spiral membranes), Colorado, USA.
27. Sajaa Brackish RO Plant (5,700 m³/d capacity with Dow Filmtec[®] spiral membranes), Sharjah, UAE.
28. Orange County Water District Brackish RO Pilot Plant (300 gpm capacity with Koch Fluid Systems' spiral membranes), Municipal facility, Southern California, USA.
29. Motorola's Ultrapure Water Double-Pass RO Plant (350 gpm capacity with Dow Filmtec[®] spiral membranes), Chandler, Arizona, USA.
30. Brackish Microfiltration Pilot Plant – Unit 3 (250 gpm capacity with US Filter's Memcor[®] hollow fine fiber membranes), Texas, USA.
31. Brackish Microfiltration Pilot Plant (25 gpm capacity with US Filter's Memtec[®] hollow fine fiber membranes), Texas, USA.
32. West Basin Water District Brackish RO Plant (42,600 m³/d capacity with Hydranautics' spiral membranes), Municipal facility, Southern California, USA.
33. New Port News Brackish RO Plant (21,600 m³/d capacity with Hydranautics' spiral membranes), Virginia, USA.
34. Ghar Lapsi Seawater RO Plant (34,000 m³/d capacity with Dupont's hollow fine fiber membranes MDS (Malta Desalination Services), Malta.
35. Ad-Dur Seawater RO Plant (45,000 m³/d capacity with Dupont's hollow fine fiber membranes), Bahrain.
36. Other plant case studies, histories and client testimonials are detailed at: <https://masar.com/testimonials>.

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