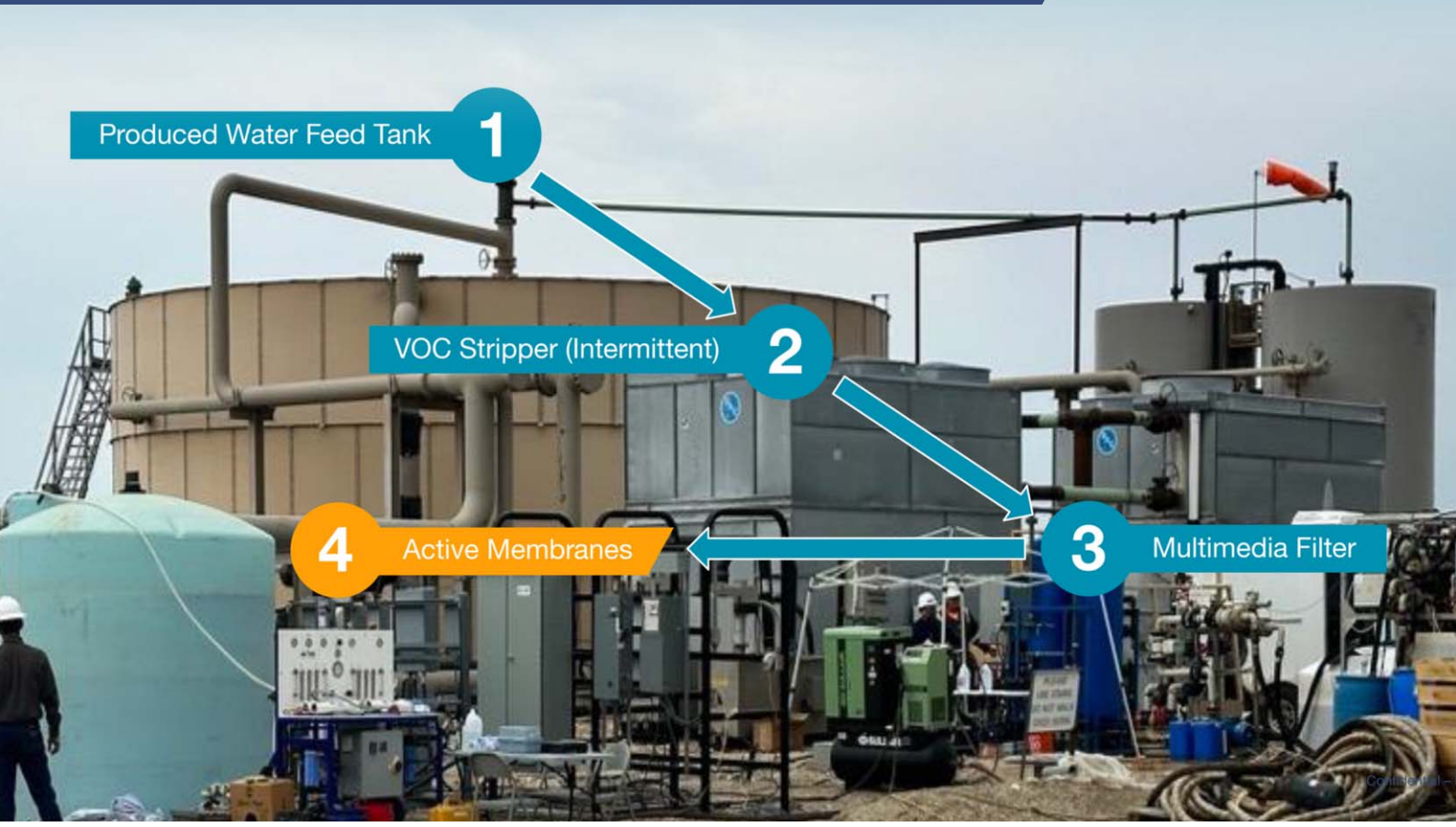
CASE STUDY

Produced Water Desalination Plant (USA)

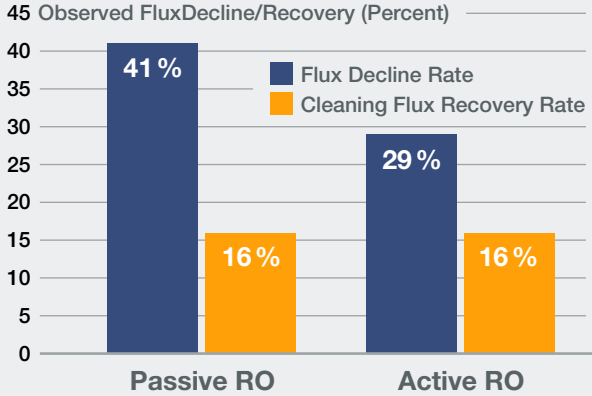


In July and August of 2023, Active Membranes conducted a groundbreaking study at a private oil production facility in western United States, treating **oil and gas produced water** as the feed source. This study was designed to evaluate the performance of Active Reverse Osmosis (RO) membranes against traditional Passive RO membranes under real-world conditions.

The produced water presented significant challenges, including high levels of colloids, dissolved organics, hydrocarbons, and scaling minerals such as calcite, silica, and iron.

These conditions often lead to rapid fouling and scaling in conventional membrane systems, driving up operational costs and limiting recovery rates.

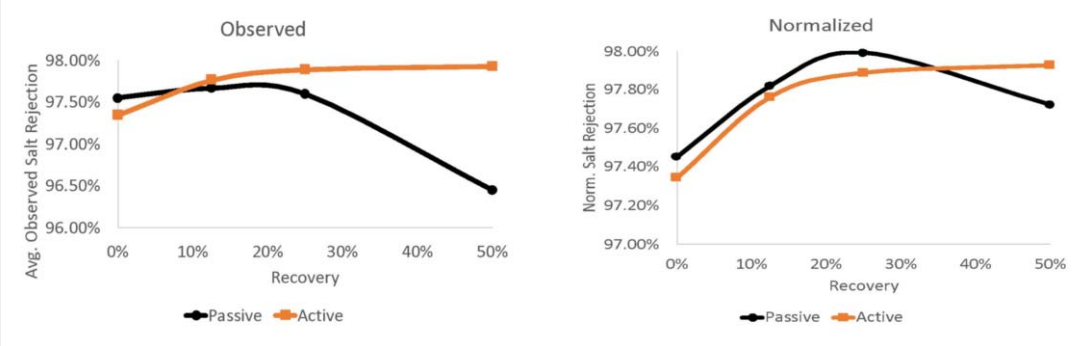
Cleaning Efficacy



Active RO Membranes reduce irreversible fouling rates by 48%, significantly extending membrane life-span.

The study employed a series of tests, including direct head-to-head comparisons and hybrid membrane train configurations. Active Membranes' innovative technology showcased its potential to revolutionize the desalination process by reducing fouling, scaling, while minimizing pre-treatment.

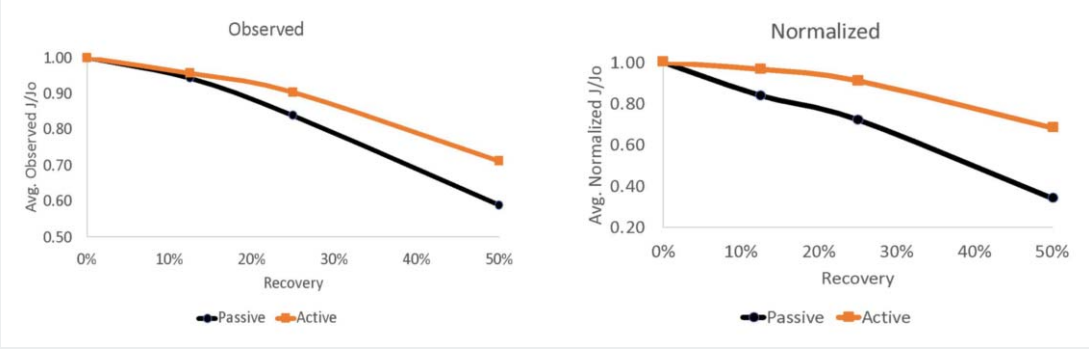
Passive vs Active
Membrane Salt Rejection Profiles



Active Salt Rejection is on-par with Passive and it gets better at higher recoveries (Lower flux decline)

Passive vs Active
Membrane Flux Decline Profiles

Starting Flux = 15 GFD – 26 LMH



Hybrid Train: 12% more observed flux stability an 34% more normalized flux stability
Cut cleaning needs by 30 – 60%
25% higher revovery potential

Key Findings

- A more stable operation at higher recoveries
- Reduced fouling and scaling rates leads to reduced cleaning cycles and enhanced membrane longevity
- Reduced need for extended pre-treatment reduces the capital and operating cost of the plant as well as its footprint

The results underscore Active-RO membranes as a game-changer for challenging water treatment applications. By reducing chemical reliance, cutting cleaning costs, and improving recovery rates, this technology enables cost effective and sustainable treatment of difficult to treat waters such as oil & gas produced water to beneficial reuse.

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