Case Study
*i*Sep™ 500 UF Produced Water Treatment

MANN+HUMMEL

Case Study: Industrial Produced Water Treatment

Cost-efficient treatment of produced and flow back waters using spiral-wound, polymeric UF membrane modules.

PROBLEM
Meeting sustainability goals in oil & gas exploration without losing performance

SITE
Oil & gas pilot system in the Midwest Region of the USA

OUTCOME
Highly effective and cost-efficient UF solution met sustainability goals

OBJECTIVE

Water scarcity and stricter discharge regulations are critical issues at the forefront of today's oil & gas industry. Fresh water is a critical resource needed for unconventional oil & gas exploration and is an important factor for future growth. In light of ongoing water issues, oil & gas producers have taken on new sustainability goals that place greater emphasis on water conservation and reuse.

MATERIALS & METHODS

*i*Sep™ 500-PVDF ultrafiltration (UF) modules were operated directly downstream of primary oil removal steps in produced and flow back water treatment systems. The high quality effluent can be directly reused, discharged, or sent to reverse osmosis (RO) for further treatment.

RESULTS

*i*Sep™ UF membranes act as a distinct barrier layer that does not allow oil, suspended solids, or bacteria to pass through. The operating flux and effluent quality remained the same, even when drastic changes in the feed water occurred.

Oil levels in the feed reached as high as 300 mg/L (Figure 1) while suspended solids (TSS) reached as high as 1,000 mg/L. Despite these spikes, the iSep UF modules continued to operate at a stable flux of 51 lmh (30 gfd). Undeterred by the spikes in the incoming water quality, the UF system provided consistent effluent quality – removing 99% oil, TSS, and bacteria (Table 1).

CONCLUSION

*i*Sep 500 PVDF UF modules help oil producers achieve their sustainability goals by providing highly effective and cost-efficient treatment of produced and flow back waters. The high oil and solids tolerance of *i*Sep UF membranes enables oil & gas producers to reuse produced and flow back waters, preserving valuable fresh water resources while reducing disposal costs.

Tables & Data

Parameters	Description
Oil & Grease	< 1.0 mg/L
Turbidity	< 0.1 NTU
Suspended Solids (TSS)	< 1.0 mg/L
Silt Density Index	< 2.0
Bacteria	Non-detect
Power Consumption	< 0.01 kW-hr per bbl
Chemical Consumption	< $0.01 per bbl

Table 1 *i*Sep 500™ PVDF UF effluent quality

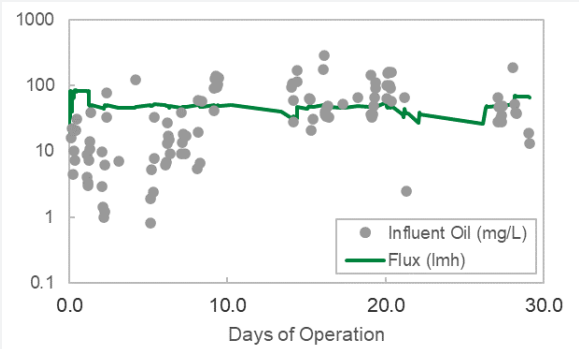

Figure 1 The operating flux remained stable at 51 lmh (30 gfd) despite the spikes in influent oil (up to 300 mg/L).

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