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Desalting and Water Purification Research Program

Reverse Osmosis Recovery Maximization

DWPR Report #119, G. Juby, Carollo Engineers

Two potential brackish potable water sources in the Phoenix area were tested at pilot scale with reverse osmosis (RO) to determine the maximum water recovery that could be obtained. A commercial dendrimer-based scale inhibitor was used to enhance water

recovery. One water source, with a largely surface water component from agricultural run-off (Western Canal water) was tested in Phase 1 of the project.

Ultrafiltration (UF) was used as pretreatment to the RO during this phase,

and the pilot system was operated for approximately 160 days. In Phase 2, a local ground water was tested with RO only, no UF, for approximately 130 days.

During Phase 1, the UF system performed well, but the RO process was not stable while operating at 90-percent recovery. Membrane performance declined after less than 30 days of operation. During Phase 2, the RO process showed better performance at 90-percent recovery. However, system performance declined with time. A membrane autopsy confirmed the presence of high concentrations of silica, calcium, iron, and aluminum on the membrane surface.

