

Ceramic UF Retrofit Saves Costs, Power, Labor and Water

CANYON REGIONAL WATER AUTHORITY — NEW BRAUNFELS, TEXAS



“When it was finally time to replace the polymeric UF membranes, we first conducted side-by-side pilot tests of two PVDF membranes and Nanostone’s CM-151. Nanostone has been the answer to our problems. The ceramic membranes are robust, low maintenance, use less process water to operate.”

Adam Telfer | CRWA Operations Manager

CHALLENGE



CRWA was experiencing operational issues with their existing polymeric UF system, threatening its ability to consistently provide 14 MGD to the community of New Braunfels, Texas

- **Difficulty meeting capacity demands:** Downtime for membrane cleaning and repairs jeopardized daily capacity goals.
- **Ongoing issues with membrane integrity:** Massive fiber breakage created an arduous task for operators in having to pin fibers so the water quality wouldn’t be compromised.
- **Low water recovery rate:** Recovery rate was only 83.6% due to the long backwashes necessary to keep the system functioning.
- **Lost productivity and unnecessary cost:** Manpower and chemical costs to maintain the polymeric UF membranes had a significant impact on operating costs.

SOLUTION

Achieving a 97.7% recovery rate compared to 83.6% prior to the retrofit, and a 50% reduction in power use.

Implementation of **Nanostone CM-151 Ceramic Ultrafiltration Membrane System** enabled CRWA to:

- **Ensure daily capacity with improved reliability,** providing a consistent supply of high-quality drinking water to the community.
- **Improve water quality,** producing permeate water with turbidity as low as 0.025 NTU as compared with 0.074 NTU previously.
- **Increase overall water recovery rate by 14.1%,** saving water and increasing plant productivity
- **Reduce power by 50%** by switching to dead-end filtration mode and eliminating the need for recirculation pumps.
- **Improve the plant’s working conditions,** phasing out hours of manual intervention to repair fiber breakage.



Canyon Regional Water Authority Ceramic UF Retrofit Background

The Canyon Regional Water Authority (CRWA) in New Braunfels, Texas operates the Lake Dunlap Water Treatment Plant, which treats surface water from the Guadalupe River. The plant is licensed to provide wholesale drinking water to Texas retail water suppliers.

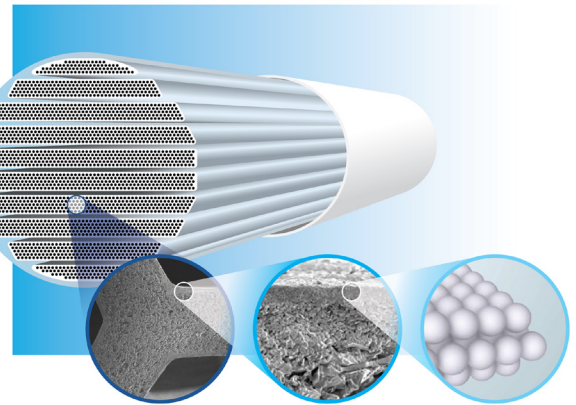
Although CRWA was operational, the plant was struggling with their polymeric UF system, making it increasingly difficult to ensure capacity and pass membrane integrity tests. Massive fiber breakage required constant manual intervention from plant operators, affecting the work environment and operating costs. The polymeric UF membranes needed frequent chemical cleanings to restore permeability, which caused membrane degradation and created systemic problems. Plant operators implemented longer backwashes, consuming a significant volume of water which led to an overall water recovery rate of 83.6%. CRWA was seeking a more resilient and robust system to address these issues.

After conducting pilot tests comparing the CM-151 and two different polyvinylidene fluoride (PVDF) membranes, the choice was clear — CRWA replaced all six of the existing polymeric UF systems with Nanostone's ceramic UF membranes. The unique

monolith design of the CM-151 increased the plant's overall output to 14.4 MGD, making CRWA the largest potable water plant in Texas to employ ceramic membranes. Nanostone's fiber-free ceramic membranes easily pass the daily integrity test without operator intervention and ensure the permeate water meets the rigorous quality standards for drinking water.

Implementation of the CM-151 modules in combination with optimizing the operating mode of the plant has increased the overall water recovery rate by 14.1%, which means less environmental impact from wasted water. Also, by switching the from cross-flow to dead-end filtration, CRWA was able to phase out the recirculation pumps, enabling a 50% reduction in power use for the plant. The drinking water being delivered to citizens of New Braunfels and the surrounding communities has significantly improved clarity, as is evidenced by permeate water turbidity as low as 0.025 NTU compared with previous levels of 0.074 NTU. Thanks to all of these improvements, CRWA has experienced significant reduction of downtime, labor, power and chemical use while saving water.

After Nanostone CM-151 retrofit, the flux rate of the ceramic membrane is 217 GFD (369 LMH). When compared to polymeric UF membranes, Nanostone's ceramic technology was a clear choice for improved efficiency, reliability and effectiveness.



Wider feed channels allow for maximum flow and require lower cleaning frequencies. The unique surface coating and overall microstructure provide consistent, reliable removal of solids down to 30 nm in size.

"Nanostone has been the answer to our problems. The ceramic membranes are robust, low maintenance and use less process water."

Adam Telfer | CRWA Operations Manager

**FOR MORE INFORMATION
CONTACT US TODAY:**

(781) 209.6900

info@nanostone.com

www.nanostone.com

