

Case Study #2: **Water Bottling Plant Regina, Saskatchewan, Canada**

Background

The World of Water drinking water bottling facility in central Canada was established, in part, as a private label manufacturer of purified drinking water. The plant was designed to utilize municipally-treated potable water supplies with a consistently high level of initial quality. Even with this treated water, World of Water's customer base expects state-of-the-art treatment for their own customers. The system includes two prefiltration stages, the R.O. membranes, and a final UV treatment step.

Challenge

The prefiltration elements used included two (2) 4.5" x 20" 20/5-micron wound filters following by the manufacturer-recommended 5-micron poly-spun filter. This then fed directly into the RO membranes and served to capture the 20-micron grit from the municipal water line. However, the 5-micron prefilter recommended by the RO membrane manufacturer, did not keep the RO membranes from prematurely fouling. Recommended backwashing cycles were not maintaining the membranes as evidenced by production (flux) decreases in a month-by-month basis.



L to R: 1. Wound 20/5-micron filter (used 1-month); 2. New wound 20/5-micron filter; 3. Second wound 20/5 micron filter (used 1-month); 4. New Poly Spun 5-micron filter; 5. Third - Poly Spun 5-micron filter (used 1-month); 6. Fourth - NanoCeram filter (used 1-month); 7. New NanoCeram filter.

Solution

To optimize the flux rate through the RO membranes, the 5-micron poly spun prefilter replaced the 20/5 wound filter and was immediately followed by a NanoCeram 2.5" x 20" electropositive filter cartridge. The membranes received the same regular backwashing cycles as before.

The first day of this new configuration indicated that there was an increase in permeate water production with all other factors remaining the same including energy consumption, feed water rate and water temperature.



The second Poly Spun from the left was in the same amount of time as the NanoCeram filter, which is third from the left. The dirt that the NanoCeram filter caught went right through a five micron Poly Spun filter. The new and used Poly Spun filters look identical.

Summary

The NanoCeram® filter cartridge led to increased permeate production through the RO membranes and is the only significant change in the entire filtration process. The two months prior to the NanoCeram installation resulted in an average permeate production of 341 liters/hour. The first month after installing the NanoCeram filter resulted in an average permeate production of 439 liters/hour. This indicates a production increase of 22% with all other production factors remaining the same.