

ABSTRACT
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Florida's First Groundwater Desalination System – Optimizing Source Water Use in Collier County

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Collier County commissioned their North County Regional Water Treatment Plant (NCRWTP) in 1993 with a production capacity of 12 million gallons per day (MGD) utilizing nanofiltration (NF) to treat groundwater recovered from the Lower Tamiami Aquifer. In 1999, the NCRWTP was expanded by 8 MGD utilizing low pressure reverse osmosis (LPRO) to treat groundwater recovered from the Lower Hawthorn Aquifer. After construction of the 8 MGD expansion, elevated levels of total dissolved solids (TDS) were observed in four Lower Hawthorn Aquifer production wells (RO-1N through -4N) located at the west end of the wellfield. Three of these wells were unusable because the existing LPRO system could not treat the elevated levels of TDS (>20,000 mg/L). In an effort to control migration of high TDS raw water from these western wells to the eastern wells and to use raw water from the existing high TDS wells, Collier County will install a high pressure RO (HPRO) treatment system at the NCRWTP.

The HPRO system will add approximately 2 MGD of finished water capacity to the NCRWTP. The quality of the groundwater feeding the HPRO system is expected to vary over the years and potentially increase in TDS concentration. In an effort to help control the variability of the HPRO system source water, concentrate from the nanofiltration system will be blended with the high TDS groundwater. This will also increase the percent recovery of the nanofiltration system from about 85% to greater than 92%, achieving more effective utilization of source groundwater.

Collier County identified that utilization of high TDS groundwater from four existing wells would help them:

- Effectively utilize existing infrastructure
- Optimize production from their existing groundwater sources
- Control the cost of water production

The results of these efforts will be the production of high quality, cost-effective drinking water.

Keywords:

Groundwater

High TDS

Reverse Osmosis

Optimization

Cost-effective

Challenge:

To provide high quality, cost-effective drinking water to customers while minimizing the impact to water resources.