

Case Study

Palm Beach County Water Treatment Plant Number 2



Client

Palm Beach County, Florida

Project

Water Treatment Plant No. 2

Location

Palm Beach County, FL

Engineer

Carollo Engineers



Figure 1: Views of the Palm Beach County WTP #2 MIEX System.

“In the first 30 minutes, we watched the clarifiers clear up until they were light blue in color. Then, shortly after that, the chlorine analyzers indicated a rapid reduction in chlorine demand, in response to which the operators were able to decrease the chlorine feed.”

Patti Brock, Treatment Plant Superintendent, Palm Beach County Water Treatment Plant No. 2

Challenge

In 2009, Carollo Engineers was hired to decommission the aging ozone system at the Palm Beach County Water Treatment Plant No. 2 and design a new treatment system for the 16.4 MGD plant. At the time, the plant's older air-fed ozone system was becoming difficult to maintain, and the availability of replacement parts was limited. The ozone system was originally installed as a means to oxidize the dissolved organic carbon (DOC) and color compounds present in the plant's raw water source to reduce disinfection by-product (DBP) formation in the finished water. As the County evaluated alternatives that would allow them to continue to comply with EPA DBP regulations without the use of ozone, they were also seeking a process with a low carbon footprint and lower energy requirements that would allow them to reduce the plant's electrical demand and monthly power expenditures.

Solution

The search for an effective DOC removal

process with low energy requirements led the County to investigate anion exchange, a process that has been successfully applied for DBP compliance at several Florida utilities, including the Village of Palm Springs, located only 2 miles from the Number 2 plant. The MIEX® Process, a fluidized bed anion exchange pretreatment process, was selected for Palm Beach County Water Treatment Plant No. 2 for a variety of reasons. In addition to pretreatment being the most cost effective application of the anion exchange process, it also allowed for reduced chemical requirements in the existing downstream lime softening process. The MIEX® System's fluidized bed configuration is also tolerant of suspended solids and oxidants, should either parameter be present in the raw water flow.

Bench scale testing performed during the evaluation process indicated that MIEX® Treatment was capable of reducing the raw water DOC concentration by up to 80% and reducing the finished water color to the EPA secondary standard of 5 CU. Additionally, the process was expected to reduce downstream lime and



IXOM

Ixom Watercare Inc.
North American Office

Toll Free 1-877-414-miex
T 303-268-5243
F 303-268-5250

33101 East Quincy Ave.
Watkins, CO 80137

E miex@ixom.com
www.miexresin.com

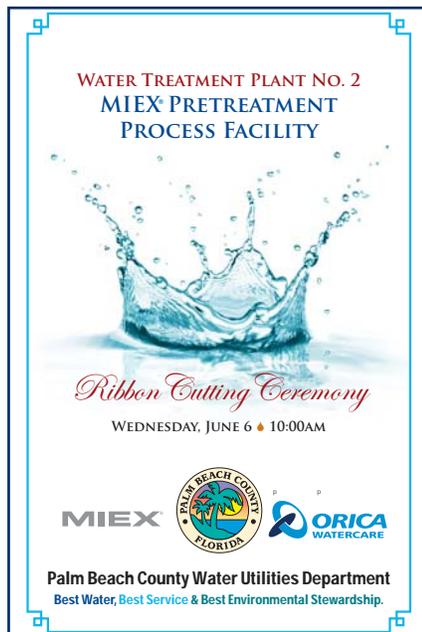


Figure 2: Celebrating the MIEX® System Commissioning in June 2012.

chlorine requirements, reduce the required flushing frequency and volume, and achieve DBP compliance without the high power costs associated with the plant's former ozone system.

A contract for construction of the 16.4 MGD MIEX® System was awarded to John J. Kirilin LLC in June 2010, and the system was successfully commissioned in March 2012. At the time of commissioning, the MIEX® System at the Palm Beach County Water Treatment Plant No. 2 was North America's largest MIEX® System in operation.

Expected Outcome

Within an hour of introducing raw water flow to the Palm Beach County Water Treatment Plant #2 MIEX® System for the first time, Patti Brock, Treatment Plant Superintendent, could plainly see the improvements in downstream water quality from her vantage point, perched at the top of the MIEX® Contactor vessels. "In the first 30 minutes, we watched the clarifiers clear up until they were light blue in color," states Brock, "Then, shortly after that, the chlorine analyzers indicated a rapid reduction in chlorine demand, in response to which the operators were able to

decrease the chlorine feed." These water quality improvements were an immediate result of the dissolved organic carbon (DOC) removal achieved by the MIEX® Pretreatment system.

Additional MIEX® System achievements include:

- Reduced dissolved organic carbon (DOC) by 80%
- Improved chlorine residual in the distribution system with a 20% reduction in chlorine dosage
- Reduced flushing in the distribution system by a factor of 5, saving water resources
- Reduced finished drinking water color from 9 to 5 CU
- Reduced electrical demand by 345 KW or 250,000 KW Hours each month, representing a \$20,000 monthly savings at 10 MGD flow
- Reduced carbon footprint (less green house gas emissions)
- Increased treatment plant capacity by 1.9 MGD by innovative softener bypass and blend
- Reduced lime dosage and lime sludge by 9%
- Reduced CO₂ dosage by 70%
- Eliminated ozone treatment process

MIEX®

Visit our website at www.miexresin.com or contact your nearest Ixom office for more information or to inquire about a specific application. MIEX® is a registered trademark of Ixom. Formerly Orica Watercare Inc.