

Arab Water Works

Client

Arab Water Works, Alabama

Project

DOC Removal

Location

Arab, AL

Commission Date

March 2008

Engineer

Utility Engineering Consultants
205-853-6020

Contractor

Advance Tank, Pell City



Figure 1: Inside view (left) & outside view (right) of MIEX® System at Arab, Alabama

“We looked all over the United States to find a system that would do the job and that we could afford. The MIEX® System beyond a doubt performed better than all other alternatives.”

David Campbell, Arab Water Works Manager.

Project Summary

Arab Water Works (AWW) sources its water from Lake Guntersville, the largest lake in the state of Alabama. With its large surface area, Lake Guntersville is prone to high levels of Dissolved Organic Carbon (DOC), which in turn results in excessive Disinfection By-Product (DBP) levels.

AWW's conventional treatment system was insufficient for meeting Stage 2 DBP compliance. After an exhaustive evaluation of treatment alternatives, the MIEX® Process was trialed and selected as the preferred treatment alternative to bring the WTP back into compliance.

Challenge

AWW's system is considered a regional water system serving approximately 30,000 customers in the Blount, Cullman, Marshall, and Morgan counties of the Brindlee Mountain area.

The man-made lake, created by Guntersville Dam along the Tennessee River, stretches 75 miles to Nickajack Dam. It is Alabama's largest lake at 69,000 acres. With all this surface area, the lake commonly experiences elevated levels of DOC.

The existing conventional 6 MGD plant at AWW pre-treats with chlorine and potassium permanganate. Chlorine is required to control algae growth in the basins while providing needed credits for disinfection contact time.

Flocculation and coagulation occur with alum. After chemical treatment, the water is settled through conventional basins and filtered in mixed media beds. Lime is added as necessary for pH correction. Finally, the water is disinfected with additional chlorine and fluoridated.

AWW realized that sufficient removal of DOC to achieve compliance with Stage 2 Disinfection By-Product (DBP) regulations could not be achieved using this treatment regime.

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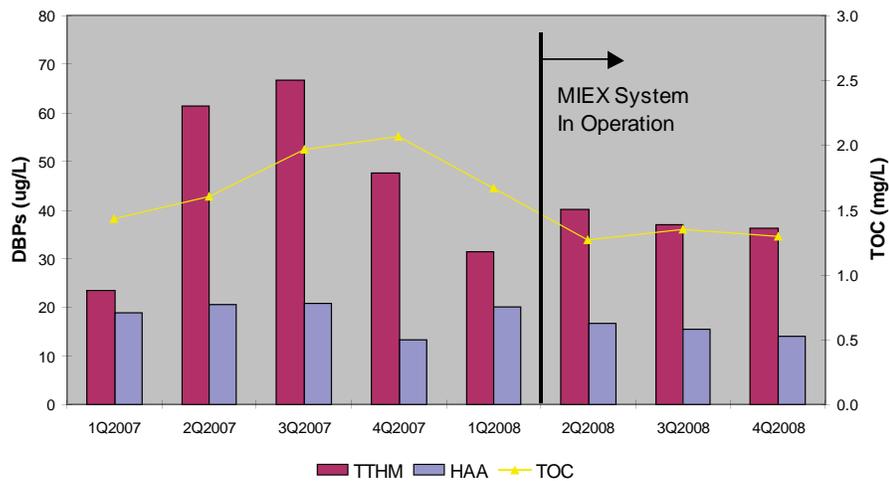
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Figure 2: Distribution system DBP & TOC levels before and after MIEX® Installation



Solution

AWW thoroughly investigated treatment solutions to comply with the more stringent DBP regulations. After evaluating alternative and enhanced coagulation, GAC, chloramines and microfiltration, AWW turned to Orica to pilot the MIEX® System in September 2005.

“The AWW Board has been looking for a better way to treat the water the past seven years,” AWW Manager David Campbell said.

“We looked all over the United States to find a system that would do the job and that we could afford. The MIEX® System beyond a doubt performed better than all other alternatives.”

A 6 MGD Dual Stage MIEX® System is being installed at the head of the conventional WTP.

During installation, the conventional WTP will be undisturbed until the final raw water valve is placed in line allowing the WTP to receive 100% MIEX® treated water or a blend of raw and MIEX® treated water, depending on the raw water DOC concentration.

Project Outcomes

In addition to DOC removal, several downstream treatment benefits were observed during the pilot including:

- Reduced Alum dose by 65%
- Reduced sludge production
- Reduced pH correction and disinfection chemicals
- Improved operational stability of the conventional treatment process
- Lower solids loading on the filters which will reduce backwash frequency