

CASE STUDY

CITY OF MIDLOTHIAN

City of Midlothian, Texas, Expands Water Treatment Plant with a Safe, Reliable Disinfection System



OVERVIEW

Located south of Dallas and Fort Worth, Midlothian has seen significant growth since plant manager Ben Wilson started with the City of Midlothian Water Treatment Plant in 1991. At that time, the city's treatment plant was relatively new, built in 1987, and was treating an average demand of ½ million gallons per day (MGD) with a maximum capacity of 3 MGD. Today, after careful planning for the future, Midlothian's combined water treatment plants average 6-8 MGD with a capacity of 18 MGD.

Around 2003, city leaders began anticipating the long-term water treatment needs of Midlothian, Texas, and by 2008, they had begun rigorous planning to accommodate the city's growth, either by building a new plant or expanding the existing facility. Building an additional plant made financial sense, created redundancy, and offered the security of being able to survive a weather emergency with minimal disruption to the community.

"I couldn't ask for better customer service and support. The system continues to run really smoothly without issues. I'm proud of the system and the effort we made to find the right fit for Midlothian. And we've received really positive community feedback on the quality of the water."

-Ben Wilson, Plant Manager

SITUATION

The original plant uses conventional dual media filtration, sedimentation, and gas chlorination. Midlothian initially considered duplicating the treatment technologies for the new plant to simplify operator cross training. However, they ultimately decided that the best strategy to accommodate long-term future growth was a new membrane filtration system with a chlorine disinfection system. Because the new plant would be built in a field adjacent to a subdivision filled with families, Midlothian preferred sodium hypochlorite (bleach) as a safer water disinfection alternative to traditional chlorine gas, which has the potential for a chlorine leak. All chlorine compounds are derived from salt, and electrolytic conversion at the facility can result in significant savings, typically costing 50-70% less to produce sodium hypochlorite on site than to buy pre-made sodium hypochlorite that requires transportation to the treatment plant. In addition, the Microclor® system generates a dilute (0.8%) hypochlorite solution that is below the hazardous material concentration threshold of 1%.



City of Midlothian, Water Treatment Plant

APPROACH

Once Midlothian decided that on-site generation was their best disinfection option, they needed to determine which on-site generation company offered the best product for their needs. Before deciding on the Microclor® product, they visited multiple facilities that were using different on-site generation technologies. Midlothian plant manager Ben Wilson commented: "We found something common at every location we visited before we saw a Microclor® unit...in the time of even a brief site visit, the horizontal designed on-site generation systems were shutting down 2-3 times in just a few hours. The operators didn't seem concerned, explaining that hydrogen gas naturally built up in the system. It wasn't a big deal to fix it, but my team and I didn't like the idea of a system that required such constant attention." Then they visited a Process Solutions, Inc. (PSI) installation in Pine Bluff, Arkansas, where a Microclor® on-site hypochlorite generation system had been installed. There, Ben and his team talked to the operator and Microclor® representatives for two hours. Unlike their other site visits, the PSI system didn't shut down a single time. Why? The electrolytic cells, the heart of the system, are configured in a vertical format with a recirculation loop on each cell that allows for optimized brine utilization and passive release of the hydrogen gas from each cell. Additionally, removing the hydrogen immediately from each cell eliminates the blinding of the electrodes by the gas bubbles.

"We realized we had a minor mechanical problem after start-up. This was on a Friday afternoon in July," recalls Wilson. "I called every number I had for anyone associated with Microclor® and only got voice mails. But within 45 minutes, PSI's founder, Gunnar Thordarson, was calling me back from California. I explained that I only had enough chlorine to get through the next day and that the system had to be running. What should I do? Gunnar offered to take a flight from California the next morning! Instead, they ended up sending a service technician who was able to solve the problem and get us back online immediately. PSI was quick to get a part out to us to replace the bad one and there was no time lost and no expense incurred. I was thrilled."

- Ben Wilson, Plant Manager



Microclor® On-Site Hypochlorite Generator

RESULTS

- The investment in Microclor® OSHG allowed the WTP to generate its own disinfectant onsite at a much safer concentration of 0.8%, which is 20% below the hazardous material threshold.
- OSHG allows Midlothian to meet its sodium hypochlorite needs for slightly over one-third the cost of trucked-in bleach while employing a much safer technology for operators and residents.
- The new smaller, vertically-oriented cells can be fully cleaned and drained in-place, resulting in a smaller installation footprint and only a fraction of the operator's time needed for maintenance cleanings.
- The new system doesn't require operational shutdowns 2-3 times a day, allowing for more efficiency over time and less maintenance required by the treatment plant staff.

CONCLUSION

After observing the reliable vertical Microclor® system in Pine Bluff, Midlothian moved ahead to include a 1,200 lbs/day system in the design of the new plant. Installation was successful, with the general contractor preparing the piping and electric and setting and plumbing the unit. PSI's technicians tested and commissioned the system and the new plant went live in July 2013. Ben Wilson reports that the Microclor® system has exceeded his expectations and the exceptional customer support from the PSI team has made this project a success. And as the area surrounding the original plant continues to develop, the City of Midlothian, Texas, upgraded their existing chlorine gas systems to Microclor® on-site generation systems.

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