cleanwater1

CASE STUDY

LOUDOUN WATER

Automated Residual Control Maintains Tank Chloramine Residual Levels and Eliminates Nitrite Issues in 3 Million Gallon Tank

OVERVIEW

Loudoun Water in Northern Virginia has a history of embracing change and seizing opportunities to create a more robust and sustainable water system. Situated in the fast-growing suburbs of Washington DC, Loudoun Water provides chloraminated drinking water to over 65,000 households through a network of over 1,200 miles of pipes and 7 tanks.

Loudoun Water has made it their mission to improve operational efficiency of their drinking water system. For a chloraminated water system, that means getting control of nitrification. Loudoun Water used to be a simple secondary system, receiving free chlorine drinking water from the City of Fairfax, then chloraminated water from neighboring Fairfax County for a blended system. However, with the growth in their community, Loudoun County continued to expand their capabilities, building additional transmission mains and storage capacity that culminated with the construction of the Dulles South tanks, a pair of 3-MG fluted composite tanks to serve the southern portion of its system.

Photo of *3MG Dulles South tanks. Loudoun Water can only operate one tank due to water quality concerns.*

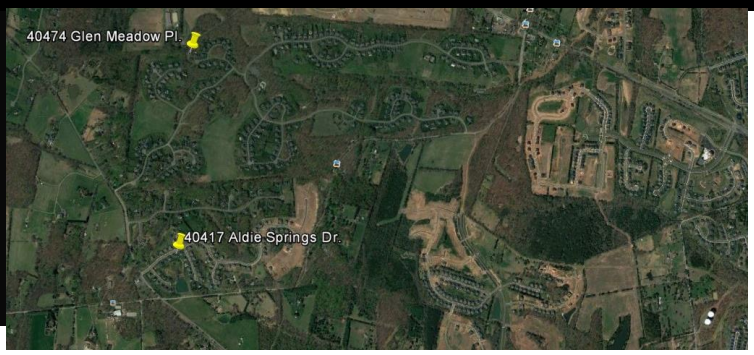
Once installed a few challenges emerged with the tanks that would pose some major threats to the water quality.

SITUATION

The Water Quality Manager developed a nitrification sampling plan to cover areas that had shown indications of low residuals and nitrification. The sampling plan revealed that nitrification in the southern part of the system was worse than previous surveys had revealed. As such, one of the tanks was taken offline to reduce water age and nitrification. To reduce the risk and prevalence of nitrification, Loudoun switch from chloramines to free chlorine for 10 weeks to supply more oxidized disinfectant to the water to reduce the presence of nitrifying bacteria. Once they reintroduce chloramines, the team must aggressively flush portions of the system at first sign of lowered residual levels. The operating staff needed a solution to fix their nitrification and low residual issues without the need to flush this part of the system all summer long.

"For me, it's all about having individual control, instead of chasing your tail…I used to spend so much time digging into water quality data and guessing where my worst problems would be. With the RCS, I can focus on the big picture of how the entire system is running."

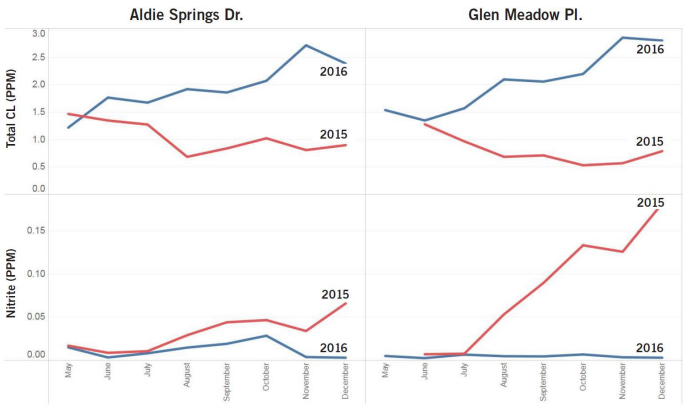
Cathy Cogswell, Water Quality Manager,
Loudoun Water



Location of two compliance points influenced by Dulles South Tank (circled in red). Aldie Springs Dr. (1.83 miles W) and Glen Meadow Pl. (2.2 miles WNW) are both influenced by water coming from the Dulles South Tank.

APPROACH

As a result of their search for a reliable, economical solution, the Loudoun Water staff learned about the Monoclor® Residual Control System (RCS). They were impressed with the overall approach – a combination of powerful PAX Mixers, along with water quality sensors, a control system, and chlorine and ammonia chemical feed skids to continuously monitor and regulate disinfectant levels. Best of all, they liked that the Monoclor® Residual Control System was optimized to reduce the amount of free ammonia in the water – the key ingredient that kicks off nitrification. Eager to test the system, Loudoun Water implemented a pilot through the Virginia Department of Health (VDH) to test its effectiveness.



Total Cl and nitrite at sample locations at Aldie Springs Dr. and Glen Meadow Pl. in 2015 versus 2016. Operation of the RCS in 2016 resulted in major improvements in total Cl levels in both locations while nitrite levels remained under control. This indicates the RCS's capability to stabilize water quality across a significant fraction of the Loudoun Water System.

"It's like a little treatment plant. We're controlling the water."

Tom Barrack, Water Plant Superintendent
Loudoun Water

CONCLUSION

The introduction of the Monoclor® RCS system was nothing short of a success. The introduction of the system to their tanks eliminated the need to excessively flush water throughout the summer season. They saw better residual levels in the tank than they had ever seen for this time of year, and they were seeing higher residual levels throughout this portion of the system. Even more unusual, they received no customer complaints for water quality from anywhere in the system served by the Dulles South Tank. Loudoun Water is planning to install additional PAX Mixers and Monoclor® RCS systems at other tanks in its system. This pilot proved that they could control water quality even during the most challenging times of the year.

"We used to struggle with water age in this part of our system," notes Barrack, "but RCS has made our water age problems essentially go bye-bye."

Cathy Cogswell, Water Quality Manager
Loudoun Water

RESULTS

- **Monoclor® Residual Control System produced better residual levels in the tank after only a few weeks of operation.**
- **They saw better results in the tank than they had ever seen before during the summer season.**
- **The new system allowed the operators to automatically adjust the ammonia levels in the water to keep nitrite levels low, which reduces the chances of nitrification occurring.**
- **The switch in the tank to chloramines was shortened from several days to 7-8 hours in total.**
- **The system enabled the staff to control water quality in a way that had not been able to before. As a result, they planned to install the Monoclor® Residual Control System in other tanks in its system.**
- **No customer complaints about water quality anywhere in the system.**

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