

CASE STUDY

The Colony

Northern Texas City Manages to Effectively Disinfect Residuals Through the Introduction of the Monoclor® RCS System



OVERVIEW

Situated on the eastern shore of Lake Lewisville, north of Dallas, The Colony occupies about 2,500 acres. In the past 15 years, it has seen its population almost to over 45,000 inhabitants. Like other communities that have struggled with rapid population growth, The Colony grapples with how to meet demand. They currently juggle multiple water sources and a water distribution system that grew with community expansion. They also have to deal with seasonality issues and periods of high water-age.

As a result of this complexity (managing wells, the City of Plano and purchased water from Dallas Water Utilities), The Colony looked for alternative solutions.

SITUATION

The City of The Colony's Water Production and Water Distribution departments tackled the challenges of system complexity and consistent water quality with thoughtful planning, a capital improvement plan and a search for new technologies.

Led by Jimmy Arthur, Water Production Supervisor, along with the engineering firm Alan Plummer Associates, Inc., The Colony examined distribution system water quality and hydraulics. A persistent area of low disinfectant residual was under the influence of one of the four elevated storage tanks (ESTs), Fluted Column #3.

which has a capacity of 1 million gallons. Located on the eastern edge of the City, the tank was an ideal place to begin to address periodic taste and odor complaints that could emerge in times of low tank turnover.

At times, the tank would experience 2 million gallons of turnover, but in other periods such as the Fall the turnover could be much lower. Lower turnover periods saw chloramine disinfectant residuals in the tank plunge which would necessitate costly flushing and even taking the tank off-line. The periodic testing and manual intervention was costly and disruptive to the water distribution staff.

At times, one of the four elevated storage tanks would experience 2 million gallons of turnover.

APPROACH

In their search for a solution, The Colony staff became aware of the Monoclor® RCS chloramine management system because it had been adopted by other Texas water utilities.

"The Monoclor® RCS system we implemented in EST #3 successfully managed our chloramine disinfectant residual through all seasons and played a big part in improving water quality in the downstream pressure zones"

Jimmy Arthur, Water Production Supervisor, The Colony



Diagram of the Monoclor® RCS System

The appeal of the Monoclor® RCS system is that it automatically:

- Generates a constant and reliable chloramine residual within the reservoir by creating a homogeneous mixture,
- Introduces chemicals (ammonia and chlorine) rationally
- Monitors the equilibrium with control logic in real-time.
- Manages the chloramine breakpoint chemistry in the tank to ensure that regardless of incoming water conditions (or sources)
- Ensures water age in the tank - the tank effluent will always have the appropriate disinfectant residual level.

Instead of unplanned operator activity around water testing, manual actions such as flushing and taking the tank off-line, operators simply set the disinfectant residual setpoint on the PLC's screen. This ensured that instruments were calibrated and that the chemical tanks were full (with liquid ammonium sulfate and sodium hypochlorite).

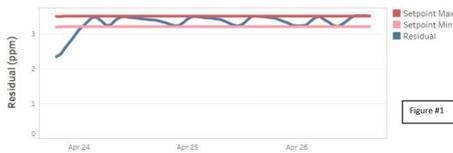


Figure #1. The operator set a nominal residual level to 3.5 ppm and the RCS system maintained that level between the control limits automatically.

RESULTS

The introduction of the Monoclor® RCS system allowed operators to eliminate the need to flush water and take the tank offline to make manual changes to the water quality. This not only reduced costs to manage the tanks, but also didn't require staff to come in for repairs and maintenance as frequently as before.

CONCLUSION

Once the Monoclor® RCS system was installed, the pressure zones influenced by the EST #3 resulted in far fewer taste and odor complaints. Additionally, a knock-on effect of residual improvement was also observed in two other hydraulically linked ESTs in the system. The operator set a nominal residual level to 3.5 ppm and the RCS system maintained that level between the control limits automatically.

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Residual Control panels in the base of EST #3



A PAX Impeller Mixer with chemical feed stems in the EST #3

