

The Challenges of Maintaining Chlorine Residuals During Summer Months

The Kansas Rural Water Association (KRWA) works with many public water supply systems during summer months in trying to help those systems address the loss of chlorine residuals. Most of such calls to KRWA or referrals by the Kansas Department of Health and Environment (KDHE) involve systems that use combined chlorine or purchase water from a system that uses combined chlorine.

Many water systems, both large and small, have had challenges maintaining chlorine residuals this past summer. When the chlorine residual starts dropping off, KRWA recommends to either overflow the water storage tank or drain and resupply the storage tank. Residuals can be checked by testing the water from the overflow. It is very important to increase the chlorine residuals in storage tanks to be in excess of 2 mg/L. Once that level of residual is achieved, it is recommended to flush the distribution system. Flushing should not be initiated until there is a good residual in the storage tank(s).



KRWA Tech Assistant Lonnie Boller places the warning sign on the exterior of another rechlorination building being constructed by KRWA. New units will be mounted on trailers for improved portability.

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The chlorine loss is usually caused when nitrification bacteria grows and forms biofilm in the storage tank(s) and waterlines.

Consecutive or systems that purchase water, have very little control over the chlorine residuals being provided to the system. This is especially true if the purchasing system cannot rechlorinate to increase residuals. And there are systems that have such physical disadvantages.

For the past several months, I have been working with a system that purchases water from a larger system. That system has had an extremely difficult time trying to maintain chlorine residuals to meet Kansas Department of Health and Environment's requirement of 1.0 mg/L or greater.

The system had been flushing water and dumping storage tanks for several weeks to keep their chlorine residuals just above the minimum requirement.

I recommended that the system install a rechlorination system. After looking at their pump station, this can be accomplished for \$10,000 to \$20,000 depending on what options are chosen. They could set this up with a small portable rechlorination building and positive displacement feed pumps and tanks. This would allow the system to increase chlorine residuals whenever it is needed. If chlorine residuals are coming in at a 2 mg/L, they could easily increase residuals to 4 mg/L. This would help to gain a much stronger chlorine residual in the water storage tanks. It would also help maintain chlorine residuals throughout the distribution system. Currently, if the chlorine residuals are coming in low from the supplying system, the purchasing system has no way of increasing the residual as they purchase water. The only thing the purchasing system can do to improve residuals is to flush a large amount water. In this case residuals at the pumphouse where they purchase water are low at 1.4 to 1.7 mg/L. And, in this case they could flush continuously, but would never exceed the 1.7 mg/L.

Over the years, I have installed rechlorination facilities at many systems, helping them improve chlorine residuals in the distribution system. Sometimes this has even been done at the request of the Kansas Department of Health and Environment (KDHE).

The process of installing rechlorination facilities without first submitting plans and specifications to the KDHE for review and approval is no longer possible. The current process requires these documents to be prepared and submitted by a licensed professional engineer which basically causes long delays because of the wait time for KDHE approval.

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KRWA has installed rechlorination stations in various water systems to help them maintain chlorine residuals. This photo shows KRWA's Tony Kimmi and Lonnie Boller working to make connections to a RWD's pumping station.

This application and review process takes a lot of time. In some cases, it can take up to six months to a year just to receive approval for review of the proposed installation of a simple rechlorination system. KRWA has set up several of these and KRWA currently even has two portable rechlorination buildings. They're all aluminum, insulated, and heated. We plan on working with an engineer to get them approved by the KDHE. Frankly, if the issue of having adequate chlorine residuals is so critical, it should not require six months for the agency to give a review of what is a simple process and something which in many prior years was routinely completed by people in the field who were experienced with the process.

The portable buildings help KRWA set up rechlorination much quicker at systems that need help to improve chlorine residuals. Some years ago, KDHE even provided funding for KRWA to construct one such unit as a demonstration project with the instructions to utilize it where it might be needed.

My advice to water systems that purchase water is to stay ahead of the game by getting their rechlorination system plans approved so they can move forward with building the system. It would be much better to have it and not need it, than not have it and then need such approval.

Lonnie Boller is a Technical Assistant at KRWA. He has been employed by KRWA since 2001.

Lonnie is a Class II certified operator; he previously was Water Plant Supervisor for the City of Horton. He has also attended and completed training at the University of Kansas Law Enforcement Training Center.

