



HOT SUMMER ADDS TO PROBLEMS OF LOSS OF CHLORINE RESIDUALS

As everyone in Kansas knows, the summer of 2010 was hot. The very warm temperatures were a big factor in water systems trying to maintain adequate chlorine residuals. Water temperatures coming from some treatment plants were recorded as high as eighty-five degrees F. In most cases the loss of chlorine residual is due to bio-films. Bio-films are microorganisms that grow in storage tanks and water lines. Bio-films are much more likely to occur when the temperatures are warmer.

Any system that feeds ammonia is also likely to have more issues with bio-films. Ammonia can be a food source for the growth of bio-films. Many operators have been frustrated this past summer because of the loss of chlorine residual. Some have been flushing millions of gallons of water to achieve a better residual. Others have overflowed storage tanks to push the older water that has lost chlorine residual out the top. If a system has a storage tank that fills from the bottom and also draws back out from the bottom, the situation may allow a large portion of the stored water to never be used.

Another factor that is likely to influence water quality is the amount of unused water in storage. If a system has a large amount of storage capacity, and small amount of usage, the water may be in the tower for many days with no exchange. Storage capacity needs to be balanced with use – or the water level will need to be adjusted accordingly.

Telemetry settings are one way of helping a system maintain chlorine residual. If an operator can adjust the water level in a tower to use a large percentage of the water before it is refilled, this will keep the water in the storage tank cooler, and water with lower temperatures is more likely to have higher chlorine residuals. The ability to drop levels in tanks varies with local conditions; pressure to customers has to be maintained.

If a system is not able to provide adequate chlorine residual throughout its distribution system, rechlorination is an excellent option. It is much easier to re-chlorinate at a booster station, because flow rates have to be known to calibrate your chlorine and ammonia pumps. Also the chlorine and ammonia is mixed better when it goes through pumps and meters.

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KRWA constructs four rechlorination stations

There are some systems that do not have the space for re-chlorinating in their pump houses. KRWA recently arranged for the construction of two, portable rechlorination buildings to help systems with such situations. The buildings measure five feet x ten feet;



Roger Engemann, KRWA Tech Assistant Tony Kimmi, and Justin Engemann, review chlorine residual logs in late September for Doniphan RWD 5. Roger and Justin work for the RWD.

each has duplicate bays measuring five feet x five feet. The space allows enough room for pumps and tanks to be installed. The stations are also equipped with exhaust systems and lighting. The exterior of the buildings is epoxy powder-coated to protect against weather and to ensure long services. The interiors are lined with 1/8-inch aluminum and powder-coated to protect from chemical reactions. They are also equipped with chlorine analyzers. This allows an operator to determine the amount of chlorine that needs to be added.

As of October 1, one of the buildings continues in service at Doniphan RWD 5 in extreme northeast Kansas. Doniphan RWD 5 purchases water from Missouri American Water Company in St. Joseph, MO. The chlorine residual the district was receiving at their pump house was not adequate to maintain a 1.0 mg/l throughout their distribution system.

KRWA Tech Assistant Lonnie Boller and I, along with Roger and Justin Engemann, operators for Doniphan RWD 5, set the building in place in June. It took one and a half days to set the building, tap new injection points for the ammonia and chlorine, and supply electricity to the building. Currently the chlorine residual leaving this building is at 4.0 mg/l. To correctly calibrate the chemical pumps, an operator needs to know the flow rate (gpm), the percentage of chlorine solution, and the amount of dosage required to maintain the chlorine residual.

Other systems that recently went to rechlorination include Butler RWD 5 at Benton and Jackson RWD 3 at Holton. Both were able to accomplish this inside their existing pump stations. Operators of both districts were pleased with the results and expressed gratitude.

KRWA has another building that has recently been finished for rechlorination; it is available for any system in need for rechlorination. Two additional buildings are being planned. Mainly the intent of these units is to provide immediate help for the systems versus wasting water, and also,



Tony Kimmi adjusts chlorine feed rate in one of the rechlorination stations provided as a service to water systems in critical need of rechlorination. KRWA has constructed several of such stations.

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to demonstrate the benefits of a system setting up rechlorination on a permanent basis.

I encourage readers to call KRWA to discuss loss of chlorine residual and rechlorination. Call 785-336-3760, or email me directly at tony@krwa.net. KRWA will also feature one of the buildings at the annual conference and exhibition in Wichita next March 29-31. Plan to stop by the KRWA booth to take a look and to discuss rechlorination and other topics that may be impacting your water or wastewater system.

Tony Kimmi has worked as a Tech Assistance for KRWA since October 2009. He has extensive experience in the operation of construction equipment. He has assisted in the construction of several rechlorination stations and ongoing monitoring of water quality issues. Tony enjoys providing assistance to public water supply systems.





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