

# Water Operators Have an Important Role in Protecting Public Health



Operators of small water systems frequently are required to be multi-taskers. They are typically responsible for more than just the water system and or wastewater system. Many receive little pay. In many other small water and wastewater systems, operators are volunteer and receive no pay. This situation may be considered a pretty foreign concept by some people – but that is the situation in small communities in Kansas.

Recently I received word that both of the bacteriological samples for a water system in western Kansas tested positive for coliform bacteria. Another sample also had *E. coli*. KDHE placed the small city on a boil water advisory. The operator called me. He mentioned he had just submitted four special study

samples to a private lab to hopefully rescind the boil water advisory.

I was more than 100 miles away attending a training session and could not be at the community immediately. I asked what actions the operator or anyone had taken before collecting the four additional samples. The answer was, "Nothing!" His additional comment was that the chlorine residual was 1.5 mg/L Free and so the samples should be negative, in the operator's opinion. I told him it would need to be checked out further. This system is the town in which I live.

When returning home, as the operator was off work, I decided to conduct what I refer to as a chlorine residual profile. There was no residual at my home. In fact, the entire southern portion of the city had no chlorine

residual in the water system. When checking the northern part of the city, close to the well, I found a location with a residual of 1.0 mg/L Free. Closer to the elevated storage tank, there was no residual.

The next morning, the operator and I adjusted the chlorinator setting to inject nearly 3.0 mg/L Free instead of the

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previous setting of 1.5 mg/L Free. Then, we began flushing the system at the far ends. This required four hours to completely drain the elevated storage tank and flush the lines. Finally, a residual of 2.0 mg/L to 3.0 mg/L Free was detected. This indicated to me that the water in the storage tank had stratified and a lot of biologic activity was taking place in the tank. We continued to check the residuals. Two hours later we found the chlorine residual near the well to be 3.0 mg/L Free. Downstream of the water storage tank, the residual was 1.7 mg/L Free. More flushing was conducted to achieve the 3.0 mg/L Free at the ends of the system.

At 5 p.m. on that day, the lab results indicated three of the four special samples that had been previously submitted were coliform positive but there was no E. coli present.

The operator was unaware how low the chlorine residual had gotten; he assumed that the water quality was satisfactory with the 1.5 mg/L Free he was measuring at the well site. What he did not do was to profile the system – in other words, check the residual in

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additional locations. He only checked chlorine residuals in one or two locations as routine samples. He has grass to mow and lots of other duties.

This summer has been very hot and very humid in Kansas. When water warms in storage tanks, it is likely to lose chlorine residual. Tank controls should be adjusted to ensure there is as large a volume of water as possible involved in the resupplying of storage. And without using a chlorine measurement tool in multiple locations, there is no way of knowing the degree to which the water quality may be deteriorating. It is important to monitor various locations in the system vs. just one or two as part of the daily work routine. Yes, there is a purpose that

residuals are monitored. That purpose is to keep bacteriological activity from developing inside the distribution system.

Providing safe drinking water to consumers, free from pathogenic and other undesirable organisms, is the primary goal of all water utilities. Disinfection is an important aspect in achieving that goal and in preventing the spread of waterborne diseases. Operators should never forget the real focus and purpose of why some aspects of work are required in public water systems and to make those among their top priorities. We should all think in terms of the priorities of protecting public health.

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