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Press Release

Treatment technique violation occurs at water treatment plant

City required to notify residents of Tier 2 violation, but citizens not in danger

ARKANSAS CITY, Kan. (February 3, 2016) — On Jan. 17, the City of Arkansas City was notified by the Kansas Department of Health and Environment (KDHE) of a treatment technique violation at the City's Water Treatment Plant that occurred between 5 p.m. Dec. 16, 2015, and 1 a.m. Dec. 17, 2015.

The public was not in any danger during the eight hours in which the violation occurred. If this had been an emergency, the public would have been notified immediately.

The violation occurred as workers were bringing the plant's newly repaired primary clarifier and mixing unit back online after several months of disuse. Now that it is functioning, the problem should not reoccur, but the City still has revised its standard operating procedure to prevent similar violations.

Prior to Feb. 1, 2015, the City operated under Environmental Protection Agency (EPA) regulations concerning ground water under the influence of surface water (the Surface Water Treatment Rule).

In preparation for the construction of a new water treatment plant and to achieve a considerable cost savings on that project in the treatment process, the City petitioned KDHE to reclassify the source water from its wells to ground water, transitioning the City's water treatment to EPA's Ground Water Rule.

To prove 4-log inactivation of viruses under the Ground Water Rule using the primary softening basin as a free chlorine contact zone, the water's pH cannot exceed 10.49 for more than four hours, among other factors. In this case, the pH in the primary basin was higher than 10.49 during five consecutive samples taken at 5 p.m., 7 p.m., 9 p.m. and 11 p.m. on Dec. 16, and at 1 a.m. on Dec. 17.

Lime treatment process difficulties

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Water Treatment Plant staff members put all of their effort into maintaining the pH within the acceptable range for the EPA's 4-log inactivation calculator to work.

The lime is blown into a silo, conveyed by a bucket lift and augured to bins above the lime machine.

This lime is not all of the same consistency — powdered lime reacts "hotter" than the larger lime particles, which are more like pebbles. Lime dosage is based on weight, but if a slug of the "hotter," more reactive lime goes through the feeder, the pH might rise to a higher level than the operator is expecting.

Based on the required Water Treatment Plant flow, the detention time in the primary contact basin can be up to six hours. As a result, even if the operator notices the rising pH and acts to reduce it, the results of that lime dosage adjustment might not be seen for six more hours, resulting in a violation.

The reverse osmosis and Greensand treatment processes that are planned for the new water treatment plant will eliminate these complications and uncertainties from City water treatment.

Adding to the difficulties experienced by operators on this occasion, Water Treatment Plant personnel were bringing the primary softening basin back online after repairs. This required them to split the flows between the primary and secondary basins while the primary basin was being refilled.

During that time, the pH rose above the 10.49 limit established by the Ground Water Rule, in part because the primary basin has a more effective mixing unit for which the plant's standard operating procedure at the time was not optimized. Those procedures since have been adjusted.

Corrective actions taken

Once the problem was detected, the lime feed was reduced immediately in accordance with the established standard operating procedure, but the pH remained high past the six-hour mark.

Staff continued to lower the lime dosage and also lower the mixed speed until the pH of the water came back into an acceptable range for the 4-log inactivation calculator. A pH of 10.39 finally was achieved at 3 a.m. Dec. 17, 2015.

Detection came thanks to the safeguards that already were in place. Operators perform pH analysis every two hours and check the lime dosage frequently. A maximum level of lime dosage has been set that is not to be exceeded.

The lime dosage procedure recently had been reviewed and adjusted to keep the pH between 9.3 and 9.9 units. This revised procedure includes adjustments for flows of both less than and more than 2.5

million gallons per day. Adjustments are made based upon the results of specific heat rise tests on the lime when it is delivered.

Since the violation last December, the lime dosing procedure has been modified further for to account for the higher efficiency of the repaired softening basin.

On Jan. 17, KDHE indicated a Tier 2 public notification would be required for this violation. City staff began preparing the notification and the City Commission was informed about it Tuesday night.

Types of public notification

Tier 2 public notifications fall into the middle grade of violations that are reportable under EPA guidelines.

Tier 1 public notifications are for the most serious violations, requiring that immediate public notice be given within 24 hours. This tier is for violations and situations that have significant potential to have serious and immediate adverse effects on human health as a result of short-term exposure.

Tier 2 public notification is required as soon as possible, but must be given within 30 days. This tier is for violations and situations that have the potential to have adverse effects on human health, but do not pose an immediate risk.

The least serious violations require Tier 3 notice. This tier is for all other violations, usually monitoring or reporting violations, and other situations that require annual public notice.

Tier 3 notifications are required within 12 months and usually are included in the City's annual Consumer Confidence Report, since it has to be delivered by July 1 of the following year.

If any tier of public notification is required due to violation of drinking water regulations, KDHE will send formal notification of the requirements to the City.

A notice of this Tier 2 violation will be included on the next Consumer Confidence Report.

What does this mean for customers?

As stated above, this Tier 2 notification is not for an emergency. If it had been a Tier 1 situation, the public would have been notified immediately.

It is important to note, however, that inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

Such symptoms, however, are not caused solely by organisms in drinking water, but also by other factors. Anyone experiencing these symptoms persistently may wish to seek medical advice. At this time, though, no cases of ill health or other complications have been reported as a result of this treatment technique violation.

The City has not detected any evidence of contamination in or other health threats to its source water, but staff are committed to restoring the required level of treatment to the water to eliminate any threat of contamination.