



# Total Coliform Positive Triggers Source Water Sampling

The Kansas Rural Water Association (KRWA) was recently contacted by the Kansas Department of Health and Environment (KDHE) to assist with the disinfection of a well at a mobile home court near Manhattan. The KDHE required this action to be taken because the system had a positive E-coli sample from two of their four wells. The water from the wells was tested for E-coli because the system had a positive total coliform sample from the distribution system and, in addition to the repeat sampling from the distribution system as required by the Total Coliform Rule, the KDHE required this action to be taken because of the requirements in the Groundwater Rule (GWR).

## What is the GWR?

As noted by the Environmental Protection Agency (EPA), the purpose of the GWR is to provide for increased protection against microbial pathogens in public water systems that use ground water as a source. The concern is that disease-causing microorganisms from fecal

This photo shows the inside of the pump house with the high service pumps that are constantly operating to maintain constant pressure in the distribution system for a small trailer court near Manhattan, Kan.

contamination may find their way into ground water. The GWR applies to all public water supply systems that use ground water, including consecutive systems. The rule does not apply to public water supply systems that combine all of their ground water with surface water or with ground water under the direct influence of surface water because these systems must comply with the surface water treatment rule.

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## Complying with the GWR

To comply with the GWR, systems must conduct compliance monitoring to ensure that the system is providing at least 4-log (99.99 percent) removal of viruses. To achieve 99.99 percent inactivation when using chlorine disinfection, systems must have adequate chlorine contact time between the point of chlorination and the first user. CT calculations (chlorine concentration x time) need to be done at

each point of chlorination to determine the chlorine residual needed for compliance. After determining the minimum chlorine residual needed for compliance, a chlorine residual test must be conducted each day at either the entry point or prior to the first user to confirm the minimum residual has been achieved. Finally, a record of these daily residuals must be submitted to the KDHE each month.

Public water systems that do not comply with the rule for either of the following reasons and experience a total coliform positive sample from the distribution system will trigger E-coli monitoring from the source:

1. The first user is located close to the source not allowing for sufficient chlorine contact time, as is the case with this mobile home court,
2. The system chooses not to perform the required monitoring and,
3. The system decides to discontinue 4-log treatment,

The EPA notes that the purpose of triggered source water monitoring is to evaluate whether the presence of total coliform in the distribution system is due to fecal contamination in the ground water source.

### Why Test for fecal coliform?

Total coliform are relatively harmless microorganisms that are found in the intestines of human and warm blooded animals. They are found in large numbers and testing for them is a relatively simple procedure, which is why they are used as a routine test to determine the safety of the water in the distribution system. Fecal coliform, which are also

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referred to as E-coli or Escherichia Coli, are a part of the group found in intestinal tract and are also found in the fecal material of warm-blooded animals. Basically fecal coliform by themselves are not usually pathogenic (disease causing)

and are indicator organisms that indicate the possible presence of other pathogenic organisms. It is impractical to test for pathogens themselves because they are typically present in such small numbers.

KRWA was dispatched to the mobile home court to disinfect the wells. Well disinfection or shock treatment is not an uncommon procedure for KRWA staff to perform. However, this process has probably been used more commonly

for treatment of iron or sulfur reducing bacteria that tend to grow around well screens and gravel pack resulting in plugging of the well screen. Disinfecting wells to treat for E-coli destruction to comply with GWR requirements has not been as common but may become more common as systems that are not complying with the GWR experience total coliform positive samples. I encourage anyone needing assistance with well disinfection for any reason to contact the KRWA.

*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.*



This 5,000-gallon concrete reservoir which is the only storage for the system.