



What Does The Revised Total Coliform Rule Mean For Your Utility?

Introduction

On February 13, 2013, the U.S. Environmental Protection Agency (EPA) published the Revised Total Coliform Rule (RTCR) in the Federal Register. This rule applies to all public water systems (PWS) in the U.S., and affected how they monitor coliform and react to positive samples.

The RTCR require utilities experiencing MCL violations, or newly defined Treatment Technique Violations, to find the probable causes of positive samples and correct them.

The RTCR includes:

- Monitoring Changes,
- Public Notification Changes,
- MCL Changes and Treatment Technique Violation,
- New Assessment Requirements, and
- Corrective Action Requirements

Monitoring Changes

While retaining the basic monitoring requirements of the 1989 Total Coliform Rule (TCR), the RTCR links monitoring frequency to water quality and system performance by:

1. Providing criteria that well-operated small systems must meet to qualify and stay on reduced monitoring;
2. Requiring increased monitoring for high-risk small systems with unacceptable compliance history; and
3. Requiring some new monitoring requirements for seasonal systems such as campgrounds and some state and national parks.

In general, utilities continue on their existing TCR monitoring schedule when the RTCR is effective. Ground water (GW) systems serving 1,000 or fewer persons remain on their TCR schedule unless or until:

- Non-community water systems (NCWSs) on quarterly/annual monitoring remain on that schedule unless/until they have an event that triggers increased monitoring.
- Community water systems (CWSs) on reduced monitoring remain on that schedule unless/until they have an event that triggers them to go to routine monitoring.
- Monitoring schedules will be evaluated during the “special monitoring evaluation” conducted by the state as part of the periodic sanitary survey.

Public Notification Changes

The revised rule gets rid of monthly public notification requirements based only on the presence of total coliforms. Instead, the RTCR requires public notification when an E. coli MCL violation occurs, or when a utility fails to conduct the required assessment and corrective action.

MCL Changes and Treatment Technique Violation

The RTCR establishes a Maximum Contaminant Level Goal (MCLG) and an MCL for E. coli; however the Rule eliminates the MCLG and MCL for total coliforms. The total coliform MCL and MCLG are replaced with a treatment technique for coliforms that requires assessment and corrective action.

1. The revised rule sets an MCLG of 0 for E. coli, and the current definition of the “acute” total coliform MCL violation under the 1989 TCR has been maintained as the MCL for E. coli under the RTCR. The MCL for E. coli is based on the monitoring results for total coliforms and E. coli. An MCL violation occurs when:
 - A system has an E. coli-positive repeat sample following a total coliform positive routine sample; or
 - A routine sample is E. coli-positive and one of its associated repeat samples is total coliform-positive; or
 - A routine sample is E. coli-positive and one of its associated repeat samples is E. coli--positive; or
 - A system fails to test for E. coli when any repeat sample tests positive for total coliforms; or
 - A system fails to take all required repeat samples following a routine sample that is positive for E. coli.
2. Under the new treatment technique for coliforms, total coliforms serve as an indicator of a potential pathway of contamination into the distribution system. A utility that exceeds a specified frequency of total coliform occurrence must conduct a “Level 1” assessment to determine if any sanitary defects exist and, if found, correct them. A Level 1 assessment is required if:
 - For systems taking 40 or more samples per month, the utility exceeds 5.0 percent total coliform-positive samples for the month; or
 - For systems taking fewer than 40 samples per month, the utility has two or more total coliform-positive samples in the same month; or
 - The Utility fails to take every required repeat sample after any single routine total coliform-positive sample.
3. In addition, under the new treatment technique requirements, a utility that incurs an E. coli MCL violation must conduct a “Level 2” assessment and correct any sanitary defects found. A Level 2 assessment is also needed if the utility has:
 - A second Level 1 treatment technique trigger within a rolling 12-month period, unless the initial Level 1 treatment technique trigger was based on exceeding the allowable number of total coliform positive samples, the state has determined a likely reason for the total coliform-positive samples that caused the initial Level 1 treatment technique trigger, and the state establishes that the system has fully corrected the problem; or
 - A system with approved reduced annual monitoring has a Level 1 treatment technique trigger in two consecutive years.

New Assessment Requirements

As part of the treatment technique requirements, all Utilities must assess their systems when monitoring results show that the system may be vulnerable to contamination. Systems must conduct either a Level 1 assessment or a more detailed Level 2 assessment depending on the level of concern raised by the results of indicator sampling.

Level 1 Assessment

A Level 1 assessment must be conducted when a utility exceeds one or more of the Level 1 treatment technique triggers specified previously. Under the rule, this self-assessment consists of a basic examination of the source water, treatment, distribution system and relevant operational practices. The utility should look at conditions that could have occurred prior to and caused the total coliform-positive sample.

In the draft guidance manual, EPA has identified questions that the utility should answer during a Level 1 assessment, these include:

1. Have any of the following occurred at relevant facilities prior to the collection of coliform samples?
 - any interruptions in the treatment process
 - any reported loss of pressure events (pressure < 5 psi)
 - operation and maintenance activities that could have introduced total coliform
 - reported vandalism and/or unauthorized access to facilities
 - visible indicators of unsanitary conditions reported
 - any fire fighting event, flushing operation, sheared hydrant, etc.
 - any sites with low or inadequate disinfectant residual or sites where it is difficult to maintain a residual
 - any other water quality parameters measured where results were out of the ordinary
2. Have there been any recent operational changes to the system?
 - sources introduced
 - treatment or operational changes
 - potential sources of contamination
3. Evaluate sample site
 - condition or location of tap
 - regular use of connection
4. Sample protocol followed and reviewed
 - flush tap
 - remove aerator
 - no swivel
 - fresh sample bottles
 - sample storage acceptable
5. Distribution System
 - system pressure
 - cross connection
 - pump station
 - air relief valves
 - fire hydrants or blow off
 - breaks
 - repairs

6. Storage Tank
 - screens
 - security
 - access opening
 - condition of tank
 - vent
 - drain overflow
 - pressure tank
 - O&M
7. Treatment Process
 - interruptions
 - POE/POU
 - softeners
 - O&M
8. Source - Well
 - sanitary seal
 - vent screened
 - air gap
 - cross connection
 - security
 - pump to waste line
9. Source - Spring
 - condition of spring development
 - condition of spring box
 - security
10. Source - Surface Water Supply
 - heavy rainfall
 - rapid snowmelt

Level 2 Assessment

A Level 2 assessment is conducted when a utility exceeds one or more of the Level 2 treatment technique triggers. It is a more comprehensive examination of the system and its monitoring and operational practices than the Level 1 assessment.

Level 2 assessments must be conducted by a party approved by the state, a third party, or the utility where the system has staff or management with the required certification or qualifications specified by the state. The utility must also comply with any expedited actions or additional actions required by the state in the case of an E. coli MCL violation.

In the draft guidance manual, EPA has identified questions that should be answered during a Level 2 assessment, these include:

1. Have any of the following occurred at relevant facilities prior to the collection of TC samples?
 - a. Were there any operation and maintenance activities that could have introduced total coliforms?
 - b. Have there been any interruptions in the treatment process?
 - c. Has the system lost pressure to less than 5 psi?
 - d. Have there been any vandalism and/or unauthorized access to facilities?
 - e. Are there any visible indicators of unsanitary conditions observed?
 - f. Have there been any analytical results or any additional samples collected, including source samples which were positive (not for compliance)?
 - g. Have there been any sites with low or inadequate disinfectant residual? Are there sites where it is difficult to maintain a residual without flushing?
 - h. Were any other water quality parameters measured and were any results out of the ordinary?
 - i. Have there been any community illness suspected of being waterborne (e.g., Does the community public health official indicate that an outbreak has occurred.)
 - j. Did the water system receive any TCR monitoring violations in the past 12 months? If yes, when.
 - k. What was the most recent date on which satisfactory total coliform samples were taken?
 - l. Have there been a fire fighting event, flushing operation, sheared hydrant, etc.
 - m. Other comments on records and maintenance?

2. Have there been any recent treatment or operational changes?
 - a. Have any inactive sources recently been introduced into the system (e.g., auxiliary systems)?
 - b. Have there been any new sources introduced into the system?
 - c. Is there evidence of any potential sources of contamination (main breaks, low pressure, high turbidity, loss of disinfection, etc.)?

3. Evaluate sample site
 - a. What is the condition of the tap?
 - b. What is the location of the tap?
 - c. What is the regular use of the connection?
 - d. Have there been any plumbing changes or construction? If yes, when and what was the repair or change?
 - e. Have there been any plumbing breaks or failure? If yes, when?
 - f. List any identified cross connections after the service connection or in premise plumbing.
 - g. Were all of the backflow prevention devices present, operational and maintained?
 - h. Were there any low pressure events or changes in water pressure after the service connection or in the premise plumbing? If yes, when?
 - i. Are there any treatment devices after the service connection or in premise?
 - j. Other comments on sample site?

4. Sample protocol followed and reviewed a. Flush tap, remove aerator, no swivel, fresh sample bottles, sample storage acceptable

5. Distribution System

- a. System pressure: Is there evidence that the system experienced low or negative pressure? If yes, when?
- b. List any identified cross connections.
- c. Pump station: Are there any sanitary defects in the pump station? Are pump(s) operable?
- d. Last pump maintenance/service date. Maintenance Performed?
- e. Air relief valves: Is the valve vault subject to flooding or does the vent terminate below grade?
- f. Fire hydrant/blow off: Are any located in an area with a high water table or pits?
- g. Is the distribution system secured to prevent unauthorized access?
- h. Are the backflow prevention devices at high risk sites present, operational and maintained?
- i. Have there been any water main repairs or additions? If yes when, and what was the repair or addition?
- j. Have there been any water main breaks? If yes, when?
- k. Was there any scheduled flushing of the distribution system? If yes, when?
- l. Is there any evidence of intentional contamination in the distribution system?
- m. Other comments on the distribution information.

6. Storage Facilities

- a. Are the overflow and vents properly screened?
- b. Is the facility secured to prevent unauthorized access?
- c. Does the access opening have the proper gasket and seal tightly?
- d. Could the physical condition of tank be a source of contamination?
- e. Is the vent turned down and maintaining an approved air gap at the termination point?
- f. Does the drain/overflow line terminate at a minimum of 12" air gap?
- g. If present, is the pressure tank maintaining an appropriate minimum pressure?
- h. Has proper O&M been performed?
- i. Was there any observed physical deterioration of the tank?
- j. Were there any observed leaks?
- k. Is there any evidence of intentional contamination at the storage tank?
- l. Has there been any facility maintenance (i.e. painting/coating)? If yes, when?
- m. Is facility maintenance occurring per appropriate schedule?
- n. Does the tank "float" on the distribution system or are there separate inlet and outlet lines?
- o. What is the measured chlorine residual (total/free) of the water exiting the storage tank today?
- p. Are there any unsealed openings in the storage facility such as access doors, vents or joints?
- q. Other comments on the storage system

7. Treatment Process. (If applicable)

- a. Treatment devices operational and maintained?
- b. Is there any recent installation or repair of treatment equipment?
- c. Were there any recent changes in the treatment process (e.g., addition of a process, change in chemical or dosage)? If yes, when, what was the change?
- d. Were there any interruptions of treatment (lapses in chemical feed, turbidity excursions, disinfection)? If yes which part, when and for how long?
- e. What is the free chlorine residual measured immediately downstream from the point of application?
- f. Did a review of the filter turbidity profiles reveal any anomalies?

- g. Were there any failures to meet the C x T calculations?
 - h. Were the flow rates above the rated capacity?
 - i. Were there any anomalies on the settled water turbidities?
 - j. Other comments on the treatment system.
8. Source – Well
- a. Is the sanitary seal intact?
 - b. Is the vent screened?
 - c. Does the vent and pump to waste terminate in an approved air gap?
 - d. Are there any unprotected cross connections at the wellhead?
 - e. How is the well used? Primary\Backup\Emergency\Not a Utility\Not Drinking Water
 - f. How far does the casing extend above grade?
 - g. Is the well cap vented?
 - h. Is there evidence of standing water near the wellhead?
 - i. Is the wellhead secured to prevent unauthorized access?
 - j. Have there been any sewer spills, source water spills or other disturbances?
 - k. Other comments on the well system. (Are there aspects of well construction and operation that would bear on observed positives?)
9. Source – Spring
- a. What is the condition of the spring development?
 - b. What is the condition of the spring box?
 - c. Is the spring secured to prevent unauthorized access?
 - d. Other comments on the spring system.
10. Source - Surface Water Supply
- a. Have there been any sewer spills, source water spills or other disturbances?
 - b. Have there been any algal blooms?
 - c. Has source water turnover occurred?
 - d. Other source water comments
11. Environmental Events
- a. Has there been heavy rainfall?
 - b. Has there been any rapid snow melt or flooding?
 - c. Have there been changes in available source water (e.g., significant drop in water table, well levels, reservoir capacity, etc.)
 - d. Have there been any interruptions to electrical power?
 - e. Have there been any extremes in heat or cold?

Corrective Action Requirements

The system is responsible for correcting any sanitary defects found through either a Level 1 or Level 2 assessment. Under the RTCR, Utilities are required to correct sanitary defects found through either a Level 1 or Level 2 assessment. Systems ideally would correct any sanitary defects found in the assessment within 30 days and report that correction on the assessment form.

If the 30 day schedule cannot be met the state and utility should work together to determine the appropriate schedule for corrective actions (which may include additional or more detailed assessment or engineering studies) to be completed as soon as possible. The schedule, which is approved by the state, must include when the corrective action will be completed and any necessary milestones and temporary public health protection measures. The utility must comply with this schedule and notify the state when each scheduled corrective action is completed.

Planning Ahead

Proactive Utilities may want to conduct mock assessments ahead of the compliance schedule to understand the potential implications of the rule. Implementing best management practices, and inspecting and repairing distribution system equipment will also help your utility stay ahead of the RTCR.