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Addressing Total Coliform Positive or E.coli Positive Sample Results in EPA Region 8

Follow-up to an Unsafe Total Coliform Rule Positive Sample

What is an unsafe or total coliform positive sample?

A water sample is unsafe, present or total coliform positive if coliform bacteria are found in the sample. Generally coliforms are bacteria that are not harmful and are naturally present in the environment. They are used as an indicator that other, potentially harmful, fecal bacteria (indicated by the *E. coli* species) could be present. If any routine or repeat sample is total coliform positive, the system (i.e., the lab) must further analyze that sample to determine if *E. coli* are present. The presence of coliform bacteria in tap water suggests that there could be a problem with existing equipment or treatment systems, contamination of the source water or a breach in the distribution system that could introduce *E. coli* contamination.

Related Information

- [Emergency Preparedness](#)
- [Revised Total Coliform Rule Forms](#)
- [Revised Total Coliform Rule](#)
- [Tech Tip: TC+ Follow Up](#)
- [Revised Total Coliform Rule and Total Coliform Rule](#)
- [Total Coliform Rule Compliance Help for Public Water Systems](#)
- American Water Works Association (AWWA) - Partnership for Safe Water

Visited 03/18/2019

What actions must be taken?

When a water system receives an unsafe or total coliform positive sample result, within 24 hours the owner or operator must collect a set of repeat total coliform samples in the distribution system for the Revised Total Coliform Rule (RTCR); additionally, all ground water sources must be sampled for *E. coli* under the Ground Water Rule (GWR). The purposes of the Revised Total Coliform Rule repeat and Ground Water Rule source water samples are to confirm the presence of coliform bacteria in the system and to determine if the ground water source is contaminated with *E. coli*.

Anytime you have a positive E.coli (EC+) sample call EPA IMMEDIATELY at 1-800-227-8917 and ask to speak with the RTCR Manager. Take 3 repeat RTCR samples for each positive routine sample, as well as GWR source samples (if applicable). See the last section of this guidance for more information on EC+ follow-up actions.

Follow these 5 steps after a positive Total Coliform Rule routine sample:

1. **Do not shock chlorinate** the system before collecting repeat, routine or source samples unless you have prior approval from EPA Region 8.
2. **Review your sampling procedures to ensure you are sampling properly**
Avoid: Sampling at new faucets or newly repaired faucets, leaky faucets, outdoor faucets or those faucets connected to softeners, hot water heaters, or pressure tanks; setting down the bottle lid or exposing the inside of the lid or bottle to anything other than the sample water (do not rinse or remove powder); and rushing your sample collection.

Do: Take your time; sanitize the sample tap and your hands; flush the tap for 5 minutes before taking the sample; and minimize the time the sample bottle is opened—open the bottle immediately prior to gathering your sample and replace the lid as soon as the sample is collected. Keep in mind that improper sampling can result in a TC positive sample that can lead to costly follow-up sampling. Also, carefully fill out chain of custody forms with your PWS ID# and sample location(s). Ensure that your total coliform rule samples are located within your distribution system and labeled appropriately, and that your ground water rule source samples are collected at your source(s) before treatment and labeled appropriately.
3. **Follow your RTCR sampling plan and the flowchart below to take your required Revised Total Coliform Rule samples:**

Visited 03/18/2019

STEPS TO TAKE AFTER A ROUTINE POSITIVE/UNSAFE /TC+ TOTAL COLIFORM SAMPLE

- 1) **Within 24 hours of notification of the *routine* TC+ sample result:**
Collect 3 repeat samples in the distribution system for each positive sample; use your regular lab form and mark the samples as RTCR repeats
- 2) **Collect your GWR source samples if you use a ground water (e.g. well) source.**
See below to ensure you collect your GWR samples properly

Remember: Anytime you have an E.coli (EC+) sample call EPA IMMEDIATELY at 1-800-227-8917 and ask to speak to the RTCR Manager. See the last section of this guidance for EC+ information.


Are any of the 3 repeat samples positive *or*
is there more than one *routine* sample that is positive *or*
did you fail to collect all 3 repeat samples?

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Conduct routine sampling the following month.

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1. You will need to complete a Level 1 Assessment** and submit it to the EPA R8 Office within 30 days.
2. Conduct routine sampling the following month.

**If any of the following criteria are met, you must contact the RTCR Manager immediately at 1-800-277-8917 , and a Level 2 Assessment must be completed by a party approved by EPA within 30 days:

- You previously triggered a Level 1 Assessment within a rolling 12 month period;
- You have any combination of TC+ and EC+ routine and repeat samples; or
- If you failed to collect all required repeat samples after an EC+ routine sample result.

Please use the [RTCR Lab Sample Form](#) along with your lab's chain of custody to indicate what type of RTCR sample you are collecting. RTCR Assessment forms, lab forms and additional RTCR information and can be found on the [EPA Region 8 - Revised Total Coliform Rule](#) webpage.

Follow the instructions below if you use a ground water (e.g. well) source and are subject to the Ground Water Rule (GWR). Check your annual Monitoring and Reporting Requirements to

Visited 03/18/2019

verify if you are subject to this rule.

Within 24 hours of being notified of a routine RTCR TC+ sample result, you must:

- Sample all ground water sources that were in use during the collection of the routine total coliform sample.
- Collect the sample(s) at the ground water source(s) prior to treatment.
- Collect one source sample for **every** routine RTCR TC+ sample (e.g. if you have three routine TC+ samples you will need to collect three source water samples from each ground water source).
- Indicate the correct Sample Point Code (e.g. GWR WL01) on the lab chain of custody form. The Sample Point Code may be found on your yearly Monitoring and Reporting Requirements document provided to all systems every year. If your ground water sources combine before treatment you may take a combined source sample, but make sure to mark the sample location as “combined” and note the ground water source Facility Codes that were combined (e.g. Combined WL01, WL02, and WL03).
- A copy of the GWR Source Sampling Form may be found at the [Drinking Water System Operations in Wyoming and on Tribal Lands in EPA R8 \(CO, MT, ND, SD, UT and WY\)](#) website, by clicking on the “Reporting Forms” link under the picture and selecting the “Ground Water Rule” link.
- The lab must analyze the sample for *E. coli*.
- If the GWR source sample is safe there is no further sampling requirement. If the source is TC+, you should inspect your system to identify the cause of the positive result but there is no further sampling requirement.
- **If any GWR source sample result is *E. coli* (EC+) positive:**
 - a. Call EPA immediately and speak with the current GWR Manager listed in the [EPA Region 8 Drinking Water Unit Contact List](#);
 - b. Within 24 hours collect five additional GWR source samples from the same source that had the EC+. If you previously took a combined source sample you will need to sample all wells separately; and
 - c. Provide Tier 1 public notice.

Wholesale and Consecutive Systems:

Wholesale systems using ground water sources must meet all of the above GWR sampling requirements when notified of a routine RTCR total coliform positive sample at the consecutive’s system, or within their own distribution system. If the GWR source sample is *E. coli* positive, the wholesaler must also notify all consecutive systems within 24 hours of being notified of the EC+ source sample result.

Consecutive systems must notify their wholesale system within 24 hours of being notified of the routine RTCR total coliform positive sample result. If the consecutive system was utilizing any of


Visited 03/18/2019

their own ground water sources at the time of the routine RTCR sample collection the consecutive's ground water sources must be sampled to meet all of the above GWR sampling requirements.

4. Thoroughly inspect the water system


Coliform bacteria in a water system are generally either a result of a failure to maintain a "closed" system and/or equipment failure. Visually inspect the system including wells, tanks, chlorinator, etc. Look for areas where soil, leaves, insects, animals, sewage or animal wastes could get into your system.

Wyoming Systems:

The Wyoming Association of Rural Water Systems (WARWS) may be contacted at 307-436-8636  to help identify the cause of the positive sample results or assist with a Level 1 Assessment.

Tribal Systems:

Contact your local EPA office to request help with identifying the cause of the positive sample:

MT - Barb Burkland at 406-457-5009 


ND and SD - Andrea Griesse at 605-945-1192 

CO, UT, and WY - Nate Delano at 303-312-6318 

SD Rural Water Systems (SDRWS) - Kurt Pfeifle at kpfeifle@sdarws.com, 605-556-7219 

ND Rural Water Systems (NDRWS) - Eric Volk at ericvolk@ndrw.org, 701-391-5080 

5. If You Have an *E. coli* Positive (EC+) Sample Result:

- a. Call 1-800-227-8917  immediately and ask to speak with the RTCR Manager.
- b. For the Revised Total Coliform Rule, take repeat samples within 24 hours in the distribution system, following your RTCR sample siting plan. If you have any combination of TC+ or EC+ routine and repeat samples or if you failed to collect all required repeat samples following an EC+ routine sample, you have a RTCR *E. coli* MCL. *E. coli* MCLs require a Tier 1 public notice, including a boil water advisory. You must distribute the public notice to all residents and customers within 24 hours; see Boil Water Advisory section below for more information. A Level 2 Assessment must also be completed by a party approved by EPA within 30 days.
- c. (As applicable) For the Ground Water Rule, collect ground water source samples following your RTCR sample siting plan. If any of the GWR source samples are EC+, you must collect 5 triggered source samples from the same source that had the EC+ within 24 hours and provide Tier 1 public notice including a boil water advisory, and distribute it to all residents and customers within 24 hours. See Boil Water Advisory section below for more information
- d. Even if you can't reach EPA by phone, you are required to take the previous steps (collect

Visited 03/18/2019

RTCR repeat samples and GWR source samples as applicable), and provide Tier 1 public notice boil water advisory).

Boil Water Advisory

If the lab results for RTCR are any combination of TC+ and EC+ routine and repeat samples or if you failed to collect all required repeat samples following an EC+ routine sample, you must issue a boil order. Boil water advisories instruct consumers to boil their water for at least three minutes before using it or else to use bottled water.

The approved [Drinking Water E. coli MCL Contamination Boil Advisory Template](#) can be used for a RTCR *E. Coli* MCL violation.

Use the approved [Ground Water Rule \(GWR\) Boil Water Advisory Public Notification Template](#) for a GWR *E. Coli* positive source water sample.

Technical Tip

Much of this information can also be found in the [EPA Region 8 Drinking Water Unit Tech Tips: Follow-up to an Unsafe Total Coliform Positive Sample](#).

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