

# REVISED TOTAL COLIFORM RULE (RTCR) IMPLEMENTATION CHALLENGES

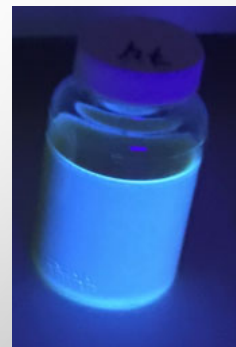
SEPTEMBER 25, 2019

WYOMING ASSOCIATION OF RURAL WATER SYSTEMS

EPA RULE TRAINING

## OVERVIEW

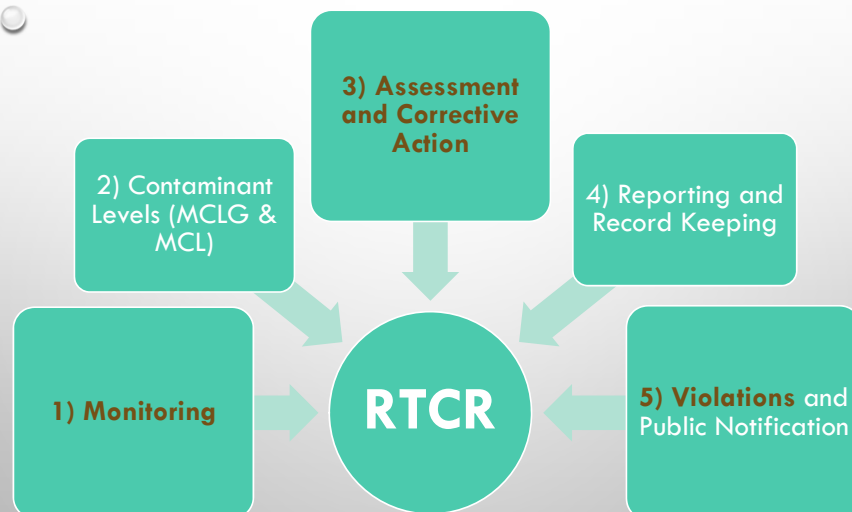
- Revised Total Coliform Rule (RTCR) in a Nutshell
- RTCR Implementation Challenges
- Food For Thought
- Monitoring
  - Sample Siting Plans
  - Sample Types
  - Important Information to Remember
- Assessments & Corrective Action
- Violations (TT & MCL)
- Learning To Fish
- Data – Drinking Water Watch and [R8DWU@epa.gov](mailto:R8DWU@epa.gov)



## E. Coli Waterborne Disease Outbreaks

- **Total coliforms** are **common in** ambient **water** and may be **injured** by ... water treatments like **chlorine disinfection**.
- **Fecal** contamination ... can cause a variety of **illnesses**, including acute gastrointestinal illness with **diarrhea, abdominal discomfort, nausea, vomiting**, and other symptoms.
- The CDC defines a **waterborne disease outbreak** as occurring when at **least 2 persons** experience a **similar illness** after ingesting a specific **drinking water**... (Kramer *et al.* 1996).
- Often **Underreported** because a fecal test is required. How often do you go to the doctor when your stomach is upset? <sup>3</sup>

## FIVE COMPONENTS OF THE RTCR



## REVISED TOTAL COLIFORM RULE (IN A NUTSHELL)

- Revised rule went into effect in April 2016.
- **All** water systems were required to complete a Sample Siting Plan by April 1, 2016.
- **All** Region 8 water systems are required to monitor for total coliforms (TC) monthly.
- Sample results are due to EPA by the 10<sup>th</sup> of the **following** month.
- For every routine TC+, system must collect 3 repeat samples and a TR GWR sample (if applicable) within 24 hours.

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## REVISED TOTAL COLIFORM RULE (IN A NUTSHELL)

- A Level 1 Assessment may be triggered if a water system has two or more TC+s in one monitoring period (month).
- Multiple Level 1 Assessments in a rolling 12-months become a Level 2 Assessment.
- One of the ways an *E. coli* (EC) MCL violation is triggered is when there are both confirmed EC and/or TC in a distribution system.
- Treatment technique violations are triggered when a required action is not completed on time.
- Reporting violations may be triggered if a sample result is received late.
- Public Notification is required with all violations.

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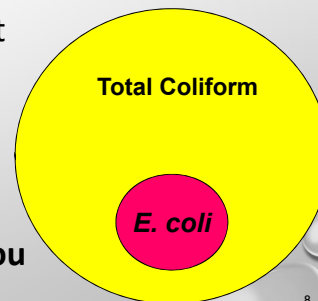
## Food For Thought

1. **TRUE OR FALSE:** *E. Coli* MCL violation is the only violation type associated with the RTCR.
2. **TRUE OR FALSE:** It is OK to use the schematic map that indicates the nitrate sampling location for your RTCR Sample Siting Plan.
3. **TRUE OR FALSE:** You have 5 days to collect a Repeat sample after a Routine TC+ result.
4. **TRUE OR FALSE:** It's a good thing to have a positive sample result (i.e., TC+ or EC+)!



## HOW THE REVISED TOTAL COLIFORM RULE (RTCRC) PROTECTS PUBLIC HEALTH

- Total coliforms are used as indicator organisms for potential contamination.
- *E. coli* is one type of bacteria found in total coliforms, it almost always originates in human or animal guts.
- If a sample is TC+, you must instruct your lab to further analyze the sample for *E. coli* (fecal coliform is no longer allowed under RTCR).
- **If any repeat samples in the distribution system are positive, you must find and fix the problem!**



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## RTCR IMPLEMENTATION CHALLENGES

### RTCR IMPLEMENTATION CHALLENGES

- **Labeling samples** – The RTCR site name must include the actual location where the sample was collected. SPO# is not an acceptable sample site for total coliform samples.
- **Incomplete Chain of Custody (Sample Form)**– If there is no PWSID on the lab forms then EPA will not accept the result. Other items often missing include the sample date, sample time, and sample type (routine, repeat, or special purpose).
- **Operator Education** – not knowing sampling requirements (i.e., required # repeat samples) doesn't excuse a violation.
- **Sampling Schedule** – systems are waiting to the end of the week or month to collect samples.

## RTCR IMPLEMENTATION CHALLENGES

- **Reporting Results Late to EPA** – be clear with your lab about who is sending results to EPA and when. What if you have to take repeat samples? Who sends those results?
- **Sample Holding Time** – if the sample is not analyzed within 30 hours of collection, the lab will reject your sample.
- **Non-certified Labs** – if a non-certified lab is used, EPA will reject the sample result. There is a list of certified labs on the Region 8 EPA website.
- **Frozen samples** – ask your lab to include a bottle of de-ionized water with your sample bottles.
- **Sample Siting Plans** – Not knowing where the plan is or not following it.

## MONITORING

### SAMPLE SITING PLANS

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### RTCR AND GWR SAMPLE TYPES

## MONITORING: SAMPLE SITING PLANS

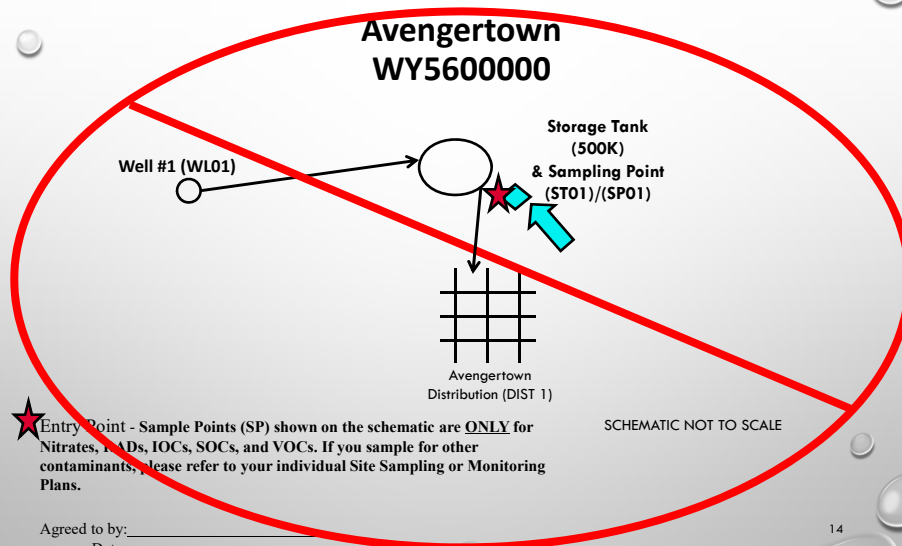
Ensure you are monitoring all parts of your water system. The plan **must** include:

- **Routine sample location(s) (for each month)**
- **Potential repeat sample site locations**
- **GWR source sample location, if necessary**
- **A map of your distribution system (not just buildings but transmission lines, water mains etc.).**

Pretend you are creating a map to guide your partner to a pot of gold. You want that map to be as clear as possible so that you can retire and leave water sampling to someone else!

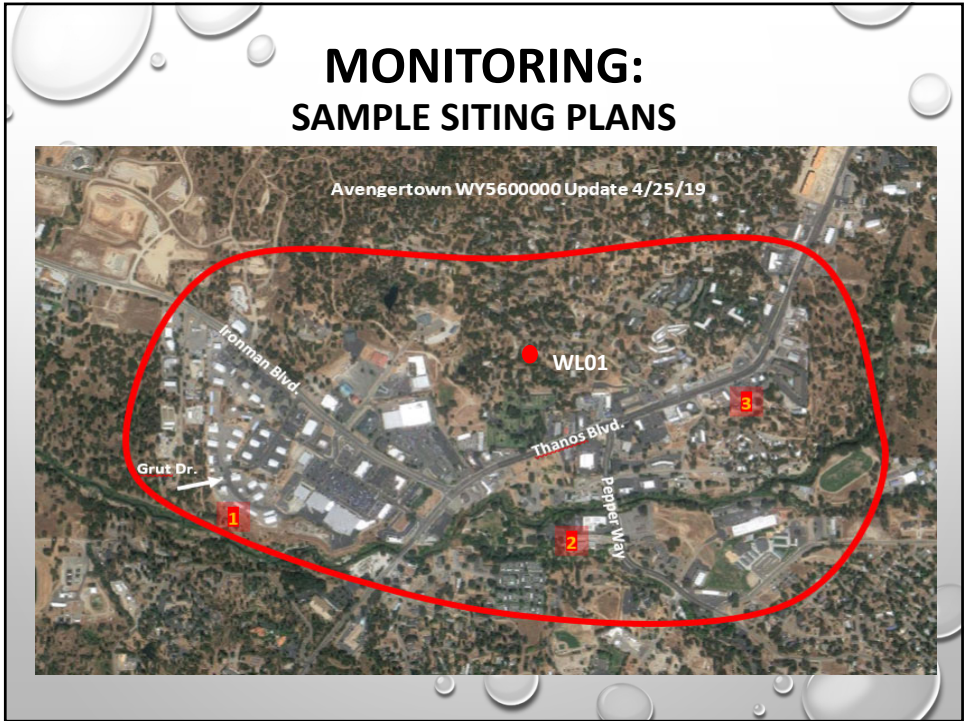
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## UNACCEPTABLE



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## MONITORING: SAMPLE SITING PLANS



## RTCR SAMPLE SITING PLAN

RTCR Sample Siting Plan - Avengertown WY5600000			
Updated 04/25/2019			
Month	Routine Sample Site	Repeat Sample Site	Source
January	1. 123 Grut Dr.	(same as routine)	WL01
		189 Grut Dr.	
		100 Grut Dr.	
February	2. 562 Pepper Way	(same as routine)	WL01
		500 Pepper Way	
		575 Pepper Way	
March	3. 2014 Thanos Blvd.	(same as routine)	WL01
		2000 Thanos Blvd.	
		2050 Thanos Blvd.	
April	1. 123 Grut Dr.	(same as routine)	WL01
		189 Grut Dr.	
		100 Grut Dr.	
May	2. 562 Pepper Way	(same as routine)	WL01
		500 Pepper Way	
		575 Pepper Way	



# MONITORING: RTCR AND GWR SAMPLE LABELING INSTRUCTIONS

## Revised Total Coliform Rule Sample Types:

- Routine
- Repeat
- Special Purpose

## Ground Water Rule (GWR) Sample Type:

- Triggered Ground Water Source Sample

RTCR & GWR Sample Labeling Instructions <https://www.epa.gov/region8-waterops/rtcr-and-gwr-sample-labeling-instructions>

# MONITORING: RTCR LAB SAMPLING FORM (CHAIN OF CUSTODY)

## WY and Tribal Revised Total Coliform Rule (RTCR) LABORATORY SAMPLE FORM

### Sampler(s) Section (For field sampler use only):

**Reminder:** Collect RTCR samples every month. If you have a total coliform positive or an E. Coli-positive, you must collect three (3) REPEAT samples according to your Sample Siting Plan. For each positive ROUTINE sample, you must collect REPEAT samples from: 1) the same site as the positive ROUTINE sample, 2) a REPEAT sample from a site within 5 taps upstream from the positive sample, and 3) a REPEAT sample from a site within 5 taps downstream of the positive sample. You must also collect a ground water source sample from any well or springs in use at the time the positive ROUTINE sample was collected. This is the triggered GWR sample. Write the correct Sample Point Code on the form below (e.g., DIST), which may be found in the yearly Monitoring and Reporting Requirements and the address where the sample was taken. Chlorine Residuals are required on routine and repeat samples.  
**You cannot use RTCR samples as a GWR source sample, or vice versa.**

**PWS  
info**

Public Water System (PWS) Name:		Sampler's Name:	
PWS Identification Number (PWSID):		Cell Phone Number:	
PWS Street Address:	City:	State:	Zip Code:
Comment:			
Sample Collection	Sample Point Address <small>(Found on your Sample Siting Plan.)</small>	Chlorine Residual (circle one) Total or Free mg/L	<b>RTCR Sample Type - Check One</b> ROUTINE - First set of required samples collected during a month. REPEATS - samples required AFTER any routine sample is positive. SPECIAL - Is a non-compliance sample that may be collected, for example, to determine if disinfection is adequate after pipe replacement or repair or to find a source of contamination. It is also used for the Seasonal Stump Checklist required sampling and daily sampling required by an Emergency Administrative Order. It cannot be used to determine compliance with the maximum contaminant level.
Date	Time		<input type="checkbox"/> Routine <input type="checkbox"/> Repeat <input type="checkbox"/> Special
			<input type="checkbox"/> Routine <input type="checkbox"/> Repeat <input type="checkbox"/> Special
			<input type="checkbox"/> Routine <input type="checkbox"/> Repeat <input type="checkbox"/> Special
			<input type="checkbox"/> Routine <input type="checkbox"/> Repeat <input type="checkbox"/> Special
Sampler(s) name (Print):		Sampler(s) signature:	
		Date signed:	

**Sample  
info**

## MONITORING: ROUTINE SAMPLES

- All water systems must collect routine total coliform samples each month they serve water to the public.
  - The number of samples required under the RTCR is dependent on the population served, and/or
  - The number of independent sources/distribution systems.
- The chain of custody must clearly indicate that the sample is a ROUTINE sample.
- Most systems that disinfect are required to collect a field measurement of **free or total chlorine residual** at the time the Routine or Repeat RTCR sample is collected.



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## MONITORING: REPEAT SAMPLES

- Repeats need to be taken ASAP after a TC+ routine sample result (ideally within 24 hours\*).
- After an ***E. coli + (EC+)***, repeat samples **MUST** be taken within 24-Hours.
- Take repeat samples **before** shock chlorinating the system or taking other corrective measures. Otherwise you are just masking the problem!
- Collect a set of three (3) repeat samples for each (1) routine TC+. All repeats must be collected on the same day.



**\*The 24-hour requirement for repeats after a routine TC+ may be extended ONLY after approval by EPA.**

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## MONITORING: ROUTINE & REPEAT SAMPLES

- **What happens when the lab calls you on Friday to tell you that the ROUTINE sample you collected on Wednesday was **TC+/EC-**?**

Should you:

- A. Avoid the phone call when you see it's the lab?
- B. Immediately call EPA to find out if you can get an extension on repeat samples until Monday?
- C. Issue a boil advisory and distribute public notice?
- D. Start calling labs to find out who will take water samples on a Friday afternoon?
- E. It doesn't really matter since its Friday and you'll be drinking beer all weekend anyways!

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## MONITORING: ROUTINE & REPEAT SAMPLES

- **What happens when the lab calls you on Friday to tell you that the ROUTINE sample you collected on Wednesday was **TC+/EC-**?**

Answers:

- B. Immediately call EPA to find out if you can get an extension on repeat samples until Monday?**
- C. Issue a boil advisory and distribute public notice?** – *Not required but you can since you won't know the results of the repeat samples until Tuesday.*
- D. Start calling labs to find out who will take water samples on a Friday afternoon?** – *This is a great idea so you are prepared in case it happens again!*

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## MONITORING: ROUTINE & REPEAT SAMPLES

**Does it change if the lab tells you its TC+/EC+ on Friday?**

Should you:

- A. Avoid the phone call when you see it's the lab?
- B. Immediately call EPA to find out if you can get an extension on repeat samples until Monday?
- C. Issue a boil advisory and distribute public notice?
- D. Start calling labs to find out who will take water samples on a Friday afternoon?
- E. It doesn't really matter since its Friday and you'll be drinking beer all weekend anyways!

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## MONITORING: ROUTINE & REPEAT SAMPLES

Does it change if the lab tells you its TC+/EC+ on Friday?

**ANSWERS:**

- B. Immediately call EPA to find out if you can get an extension on repeat samples until Monday? - REQUIRED**
- C. Issue a boil advisory and distribute public notice? - REQUIRED**
- D. Start calling labs to find out who will take water samples on a Friday afternoon? - REQUIRED**

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## MONITORING:



### SPECIAL PURPOSE SAMPLES

- Special Purpose samples are helpful for evaluating system processes, to see if your system is working properly.
- Samples labeled as Special Purpose can not and will not count towards monthly compliance.
- Special Purpose samples cannot be changed to ROUTINE samples after they are analyzed.
- However, even if you are doing work on the system you are required to collect a monthly compliance sample (ROUTINE), if you mark it “special purpose” you will receive a monitoring violation.

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## MONITORING

### IMPORTANT INFORMATION TO REMEMBER!

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## REMEMBER!!!

- **Sample Bottles:** Use only clean, undisturbed containers supplied by an EPA-certified lab. Label them properly and **keep extra bottles** on hand if repeats or re-samples are necessary.
- **30-Hour Holding Time:** Begins when the sample is collected until **the lab begins analysis** of the sample. Results from samples over 30-hours **WILL NOT BE ACCEPTED BY EPA!!!**
- **Chain of Custody:** If you do not include the **PWSID**, **sample type** (Routine, Repeat or Special Purpose), the **date & time** the sample was collected, the **date & time** the lab received the sample and the **sample location** you may receive a violation because EPA could not track your sample(s) results correctly.

## ASSESSMENTS AND CORRECTIVE ACTIONS

## PURPOSE OF ASSESSMENTS

- **Find and fix the problem!**
- The RTCR requires PWSs to investigate the entire water system when monitoring results show the system may be vulnerable to contamination and correct any “**sanitary defects**” identified.
- A **sanitary defect** is an issue that could provide a path for microbial contaminants to enter the distribution system **OR** indicates a failure in a protective barrier that is already in place.

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## PURPOSE OF ASSESSMENTS

The type of Assessment triggered is dependent on the severity and frequency of the problem:

- **Level 1 Assessment** - a basic assessment completed by the PWS.
- **Level 2 Assessment** - a more detailed assessment conducted by an EPA-approved third party.
- Failure to complete an Assessment and/or correct a sanitary defect is a treatment technique (TT) **violation**.

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## PURPOSE OF ASSESSMENTS

- **Both Level 1 and 2 Assessments include review and identification of the following elements:**
  - **Atypical events** that may affect water quality in the distribution system;
  - **Changes in distribution system** maintenance and operation that may affect water quality in the distribution system, including water storage;
  - **Source and treatment considerations** that impact water quality in the distribution system, where appropriate;
  - Problems with **sample sites, sampling protocol, and sample processing.**

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## Assessments vs. Sanitary Surveys Sanitary Defects vs. Significant Deficiencies

- **Level 2 Assessments** are triggered by an *E. Coli* MCL Violation or multiple Level 1 Assessments within a rolling 12-month period.
  - The positive results represent potential acute health considerations and require a quick turn-around time (30 days) to complete the required corrective actions and report them back to the EPA. The issues identified are called “**Sanitary Defects.**”
- **Sanitary Surveys** are conducted at regular intervals at water systems.
  - Surveys represent a routine review of your water system’s ability to produce safe, potable water. The survey strives to identify any facilities or practices which could compromise the quality of water provided to the consumer, called “**Significant Deficiencies.**”

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## Issues Identified in L1 Assessments By Water System Operators in 2018 & 2019

- **Sample Site Issues:** the collection point was a swivel faucet;
- **Distribution System Issues:** low disinfectant residual or recent flushing of the hydrants;
- **Storage Tank Issues:** debris in the storage tank, tank not cleaned in more than 5 years, stagnant water;
- **Sampling Protocol Issues:** the sampler didn't remove the aerator or didn't disinfect the tap before taking the sample; and
- **Some systems identified problems maintaining disinfectant residuals, but out of 92 Level 1 Assessments triggered, 69 systems had no treatment.**

## Common Issues Identified in 2018 Level 2 Assessments

- All systems had problems with following sample siting plans and sampling technique.
- Half of the systems had leaks or main breaks identified as part of the problem.
- Many systems has issues with unprotected cross-connections.
- Other common problems were with low disinfection levels, source problems and storage tank problems.

# **VIOLATIONS**

**(TREATMENT TECHNIQUE and MCL)**

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## **TREATMENT TECHNIQUE VIOLATION**

- A treatment technique violation is incurred when a treatment technique trigger is left unaddressed. Some examples include:
  - A Level 1 Assessment is not completed and returned to EPA, or
  - Failure to complete the corrective action identified in an Assessment,

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## E. COLI MCL VIOLATIONS

E. coli MCL Violation Description	
Routine sample	Repeat sample
(1) TC+	EC+
(2) EC+	TC+
(3) EC+	Fails to take <u>all</u> required repeat samples
(4) TC+	TC+ (but not analyzed for <i>E. coli</i> )

40 CFR 141.63 & 141.860(a)

## E. COLI (EC) MCL VIOLATION REQUIREMENTS:

**YOU MUST Notify EPA within 24 hours.**

- Because it's related to an EC+ you may be required to issue a boil water advisory and provide an alternative source of water.
- Hand deliver public notification.
- An Emergency Administrative Order (EAO) will be issued by the EPA Enforcement Division.

**Within 30 days**, complete the following requirements:

- ✓ Participate in a Level 2 Assessment
- ✓ "Find and fix" all sanitary defects identified by EPA

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## Learning to Fish!

- **TRUE OR FALSE:** You should only call EPA as a last resort if you have a TC+ sample result.
- **TRUE OR FALSE:** If a sample labeled “special purpose” is TC+, you should do a happy dance that it wasn’t your compliance sample!
- **TRUE OR FALSE:** After submitting an Assessment, there is nothing else left to do.
- **TRUE OR FALSE:** When emailing TC data to EPA, send it to [R8DWU@epa.gov](mailto:R8DWU@epa.gov) and include your “PWSID” and “WY Bact” in the subject of the email.



## Learning to Fish!

1. **FALSE:** EPA always wants to talk to you! Don’t rely on your lab or good buddy to give you regulatory information. Call EPA directly to ask us any questions you have or just to say hi! But remember to always call us if you have any TC+ or EC+ sample results.
2. **False:** You should always investigate further if you have any sample result come back TC+ to figure out the source of the contamination. We recommend collecting special purpose samples to try and figure out the extent of the problem and if it has been corrected.
3. **False:** You must complete corrective actions. If you run a CWS, you also must include specific language in your Consumer Confidence Report that you triggered an Assessment.
4. **True** when emailing total coliform lab results to EPA, you should only send it to [R8DWU@EPA.gov](mailto:R8DWU@EPA.gov).

# DRINKING WATER WATCH

## Drinking Water Watch Online

<https://sdwizr8.epa.gov/region8dwwpub/default.jsp>

- No password needed.
- Check sample results for all reported analytes.
- Give EPA about a week to enter results after you received them from your lab.
- Check annual monitoring and reporting requirements.
- Send all data to [R8DWU@epa.gov](mailto:R8DWU@epa.gov) with the PWSID and contaminant in the subject line.

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# DRINKING WATER WATCH

<https://sdwizr8.Epa.Gov/region8dwwpub/default.jsp>

Drinking Water Watch Branch

Drinking Water Watch

Region 8 Public DWW

Version 3.02

Drinking Water Online Home

Make A Selection

Wyoming

Region 8 Tribes

Submit

[EPA Home](#) | [Privacy and Security Notice](#) | [Contact Us](#)

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# DRINKING WATER WATCH

https://sdwisr8.Epa.Gov/region8dwwpub/default.jsp

**Links**

[Water System Facilities and Schematics](#)

[Sample Schedules, Reminders, and ChemRad Sample Form](#)

[Coliform/Microbial Sample Results](#)

[Coliform Sample Summary Results](#)

## Drinking Water Branch

### Water System Details

<b>Water System No. :</b>	08	<b>Federal Type :</b>	C
<b>Water System Name :</b>	WATER SYSTEM	<b>State Type :</b>	C
<b>Tribal Reservation Name :</b>	RESERVATION	<b>Primary Source :</b>	GW
<b>Status :</b>	A	<b>Activity Date :</b>	1977

### Points of Contact

Name	Job Title	Type	Phone	Address
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# DRINKING WATER WATCH

https://sdwisr8.Epa.Gov/region8dwwpub/default.jsp

**Return Links**

[Water System Detail](#)

[Water Systems](#)

[Water System Search](#)

[County Map](#)

**Glossary**

## Drinking Water Branch

### Coliform Sample Results

<b>Water System No. :</b>	08	<b>Federal Type :</b>	C
<b>Water System Name :</b>	WATER SYSTEM	<b>State Type :</b>	C
<b>Tribal Reservation Name :</b>	RESERVATION	<b>Primary Source :</b>	GW
<b>Status :</b>	A	<b>Activity Date :</b>	1977

This list displays Coliform Sample Results for the last 2 years by default. If you need to search for a specific date range, use the following date fields (you can also pick a date from the pop-up calendar next to the field) and click on Search.

Sample Collection Date From  To  SEARCH

Type	Lab Sample No.	Collection Date & Time	Sampling Point	Sample Location	Presence/Absence Indicator	Free CL Res	Tot CL Res	Analyte Code	Analyte Name	Monitoring Period Begin Date	Monitoring Period End Date	Laboratory
RT	1	01-06-2017, 0709	DIST	DISTRIBUTION SYSTEM	A		.38	3100	COLIFORM (TCR)	01-01-2017	01-31-2017	PWS EPA certified Lab
RT	1	01-06-2017, 0709	DIST	DISTRIBUTION SYSTEM	A		.38	3014	E. COLI	01-01-2017	01-31-2017	PWS EPA certified Lab
RT	2	02-06-2017, 0702	DIST	DISTRIBUTION SYSTEM	A		.64	3100	COLIFORM (TCR)	02-01-2017	02-28-2017	PWS EPA certified Lab
RT	2	02-06-2017, 0702	DIST	DISTRIBUTION SYSTEM	A		.64	3014	E. COLI	02-01-2017	02-28-2017	PWS EPA certified Lab

## SUBMITTING DATA TO R8DWU@EPA.GOV

1. Include your PWS ID# in the subject line of the e-mail.
2. Include the correct keyword or abbreviation for the documentation being submitted in the subject line of the e-mail.
3. More than one type of documentation can be submitted in the same e-mail as long as the subject line of the e-mail contains the correct keyword or abbreviation for each type of document being submitted. Each keyword should be separated by a comma. For example, if an e-mail contains both nitrates, inorganic compounds (IOC), volatile organic compounds (VOC), and synthetic organic compounds (SOC) results; the e-mail subject could be: "WY5600000 NO3, IOC, VOC, SOC".
4. Do not copy any EPA staff directly on the e-mail.

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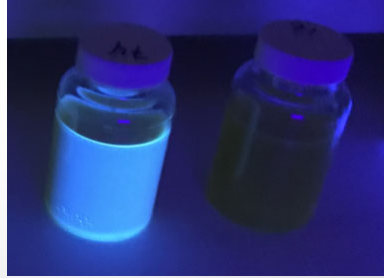
## RESOURCES

- REVISED TOTAL COLIFORM RULE LAB SAMPLING FORM  
<https://www.epa.gov/region8-waterops/revised-total-coliform-rule-lab-sampling-form>
- RTCR AND GWR SAMPLE LABELING INSTRUCTIONS  
<https://www.epa.gov/region8-waterops/rtcr-and-gwr-sample-labeling-instructions>
- EPA REGION 8 DRINKING WATER UNIT TECH TIPS: FOLLOW-UP TO AN UNSAFE TOTAL COLIFORM POSITIVE SAMPLE <https://www.epa.gov/region8-waterops/epa-region-8-drinking-water-unit-tech-tips-follow-unsafetotal-coliform-positive>
- BEST PRACTICES TO COLLECT A TOTAL COLIFORM WATER SAMPLE  
[https://www.youtube.com/watch?v=k\\_l294gppak](https://www.youtube.com/watch?v=k_l294gppak)
- REPORTING PUBLIC DRINKING WATER SYSTEM RESULTS IN WYOMING AND TRIBAL EPA REGION 8 <https://www.epa.gov/region8-waterops/reporting-public-drinking-water-system-results-wyoming-and-tribal-epa-region-8>

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## QUESTIONS?

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Fax: 1-877-876-9101  
Email: [harris.jamie@epa.gov](mailto:harris.jamie@epa.gov)  
R8 website: <https://www.epa.gov/region8-waterops>

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