REVISED TOTAL COLIFORM RULE (RTCR) IMPLEMENTATION CHALLENGES

SEPTEMBER 21, 2016

FALL WARWS CONFERENCE

OVERVIEW

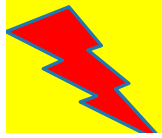
- Revised Total Coliform Rule (RTCR) in a nutshell
- Monitoring
  - Sample siting plans
  - Sample Types
  - Important Information to Remember
- Assessment & Corrective Action
- Violations (TT & MCL)
- Reporting and Recordkeeping

REVISED TOTAL COLIFORM RULE (IN A NUTSHELL)

- Rule went into effect in April 2016
- **All** systems required to monitor monthly
- **All** systems must complete a sample siting plan and have it submitted to EPA by April 1, 2016
- **Before** serving water to the public seasonal systems **MUST** complete a seasonal startup checklist and certify to EPA it was completed
- For every TC+, system must collect 3 repeat samples and a TR GWR sample (if applicable) within 24 hrs

REVISED TOTAL COLIFORM RULE (IN A NUTSHELL)

- If system has two or more TC+s in one monitoring period a Level 1 Assessment is triggered
- If more than one Level 1 Assessment is triggered in a rolling 12-months it becomes a Level 2 Assessment
- *E. coli* MCL violations have changed from TCR
- Treatment technique violations are new with RTCR
- Reporting violations are new
- Public Notification is still required

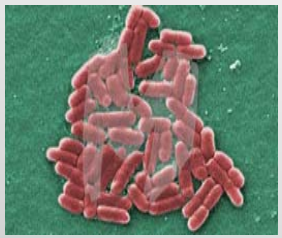


TRUE OR FALSE: MCL VIOLATIONS ARE THE ONLY TYPES OF VIOLATIONS YOU CAN INCUR WITH RTCR?

COLIFORM FACTS

Coliforms are bacteria that:

- Are found naturally in the environment
- Most coliforms will not harm you



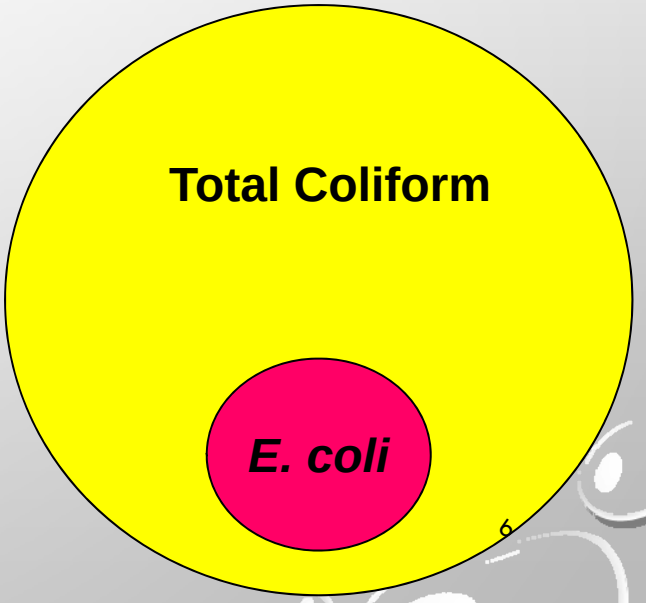
- Should be absent with adequate chlorine residual/mindful sampling

So why do we care?

HOW THE TCR (AND NOW RTCR) PROTECTS PUBLIC HEALTH

- Coliforms are used as indicator organisms for potential pathogenic contamination.

- If a sample is TC+, you must instruct your lab to further analyze the sample for *E. coli* (fecal coliform is no longer allowed).



COLIFORM FACTS

HOW COULD COLIFORMS GET IN MY WATER SYSTEM?

Source water contamination:

- Soil runoff
- WWTP discharges
- Septic tank or sewer failure
- Wellhead Imperfections

Contamination during treatment & storage

- Open/faulty storage reservoirs (animal droppings/vandalism)

Infiltration from leaks

Inadequate cleaning of new or repaired pipes

Cross Connections

Bacterial growth in distribution system (nitrification)

RTCR PURPOSE

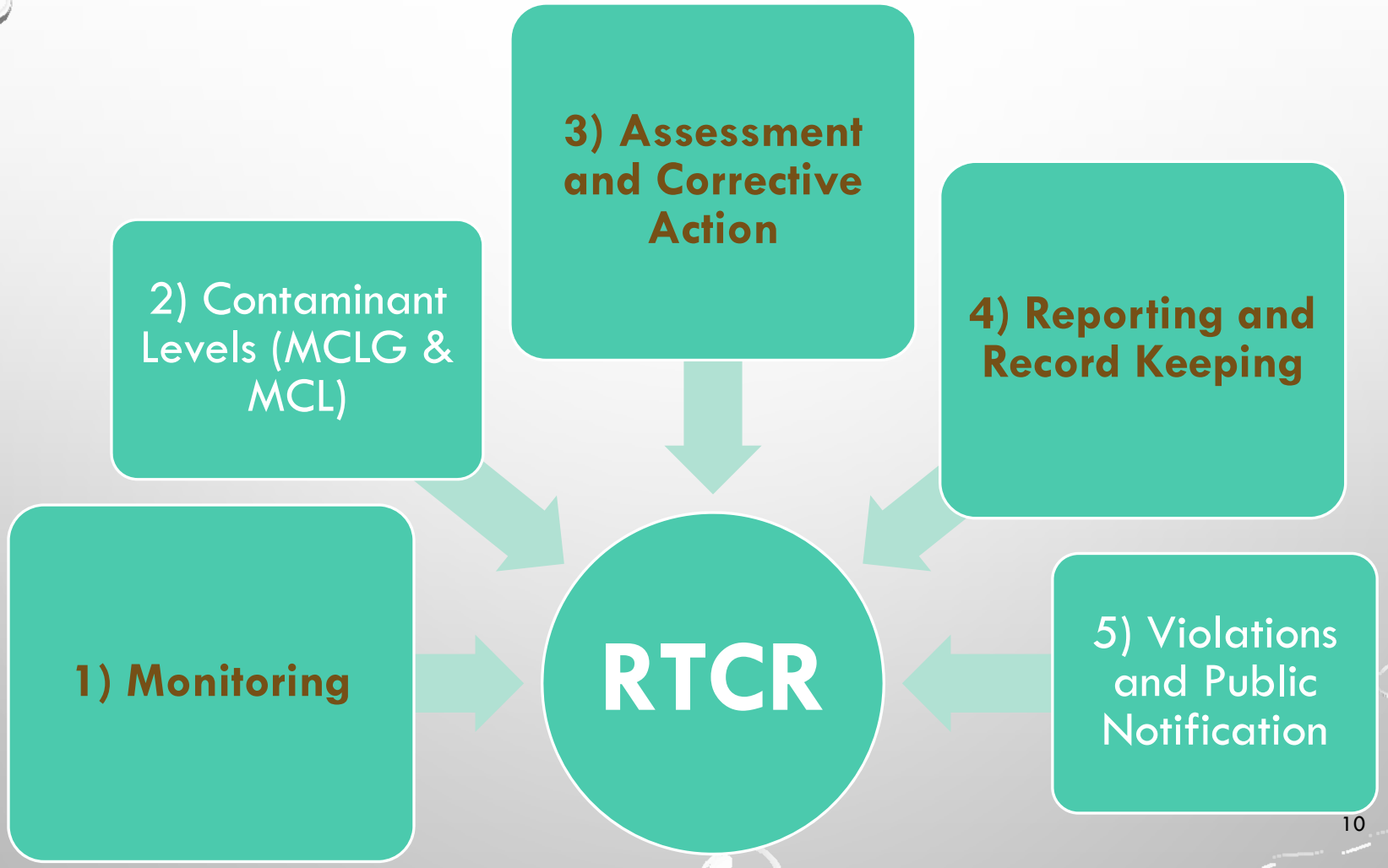
- Improve public health protection by reducing the pathways through which fecal contamination and pathogens can enter the distribution system
- TCR & RTCR objectives:
  - Evaluate effectiveness of treatment
  - Determine integrity of distribution system
  - Signal possible presence of microbial contamination

TCR VS. RTCR

- **Total Coliform Rule** - Ensures integrity of the distribution system by routinely monitoring for potential microbial contamination.

- **Revised Total Coliform Rule -** Requires systems vulnerable to microbial contamination to identify and fix problems.

ELEMENTS OF RTCR



MONITORING

SAMPLE SITING PLANS

MONITORING:
SAMPLE SITING PLANS

THANK YOU FOR SENDING IN YOUR SAMPLING SITING PLANS!

- We have received approximately 713 plans so far.
- Important to make sure samples are being collected from the most representative locations in the distribution system.
- Not new to RTCR, but more specific.
- Plans are subject to review and revision – from EPA and from you!

Send these in to EPA via email: **R8DWU@epa.gov**.

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)**
- **List potential repeat locations**
- **List GWR source location, if necessary**
- **Include a map of your distribution system (not just buildings but transmission lines, water mains etc.)**

Pretend you are creating a map for someone to find a treasure that they will give entirely to you. You want that map to be as clear as possible so they can find the treasure each month.

TRUE OR FALSE: NOT SAMPLING ACCORDING TO YOUR SYSTEM'S SAMPLE SITING PLAN IS AN RTCR VIOLATION?

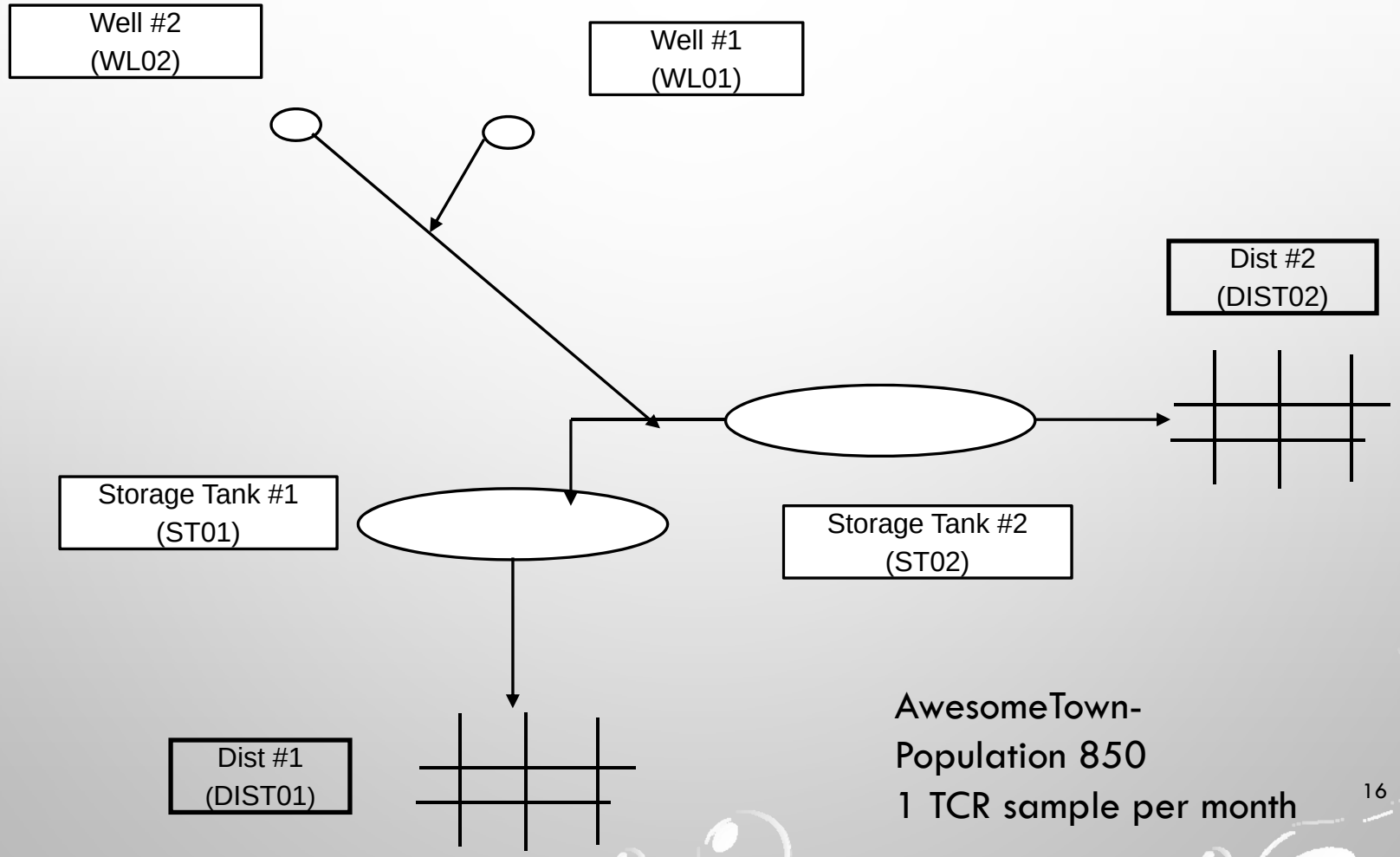
MONITORING:
SAMPLE SITING PLANS

- Representative of the entire distribution system;
- Location of main transmission mains, pressure zones, and storage tanks;
- Zones that are upstream and downstream of all storage tanks;
- Cross-connection hazards;
- Seasonal or locations that periodically receive water;
- Areas of the distribution system delivering water from different sources;
- Areas of the distribution system with longer retention times; and
- Areas of the distribution system with low water pressure and slow water movement.

IMPLEMENTATION ISSUES WITH SAMPLE SITING PLANS

- No map
- Sample sites not representative of distribution system
- Inadequate sampling locations
- Map can't be read (too dark, too light, pencil on a b/w map)
- Schematic is sent instead of an actual map for a distribution system that is more than one building
- Sample Site names written incorrectly – must include DIST in name
- Whole plan is in a secret language that only the operator understands

SAMPLE SITING PLAN PROBLEMS



AwesomeTown-
Population 850
1 TCR sample per month

RTCR MONITORING:
INCORRECT SAMPLE SITING PLAN

1 sample/mo	Routine sample location	Repeat sample location	GWR sample location
January	1) Town Hall	1) (same as routine)	1) SS01- Source
		2) Club house kitchen	
		3) SP02	
February	2) Mr. Roper's House	1) (same as routine)	
		2) Ms. Janet's House	
		3) Ms. Chrissy's House	

TRUE OR FALSE: IF THE SYSTEM SAMPLES FROM MR. ROPER'S HOUSE IN JANUARY IS THAT A VIOLATION?

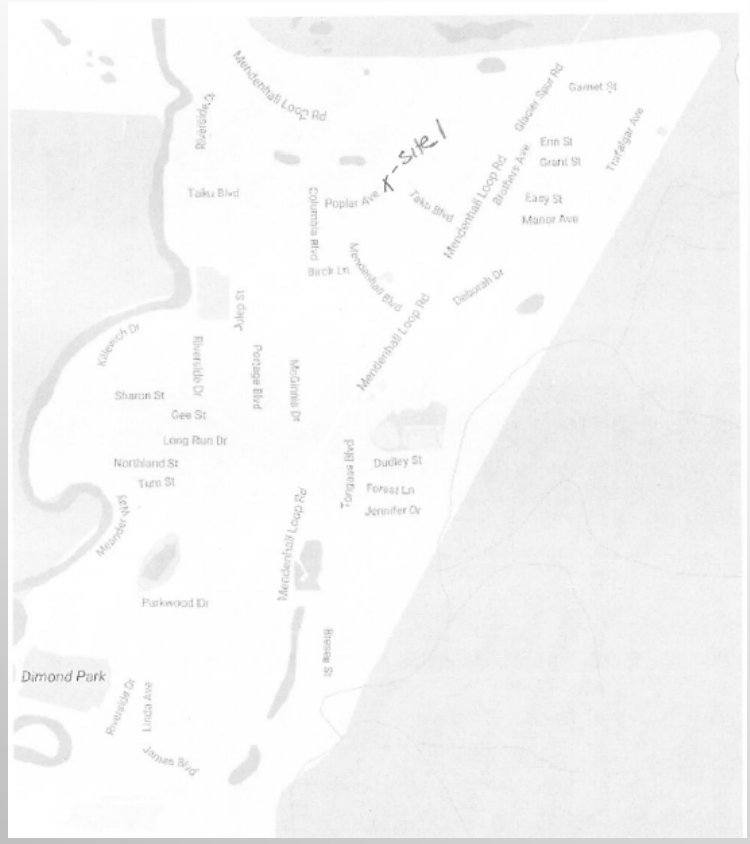
RTCR MONITORING:
CORRECT SAMPLE SITING PLAN

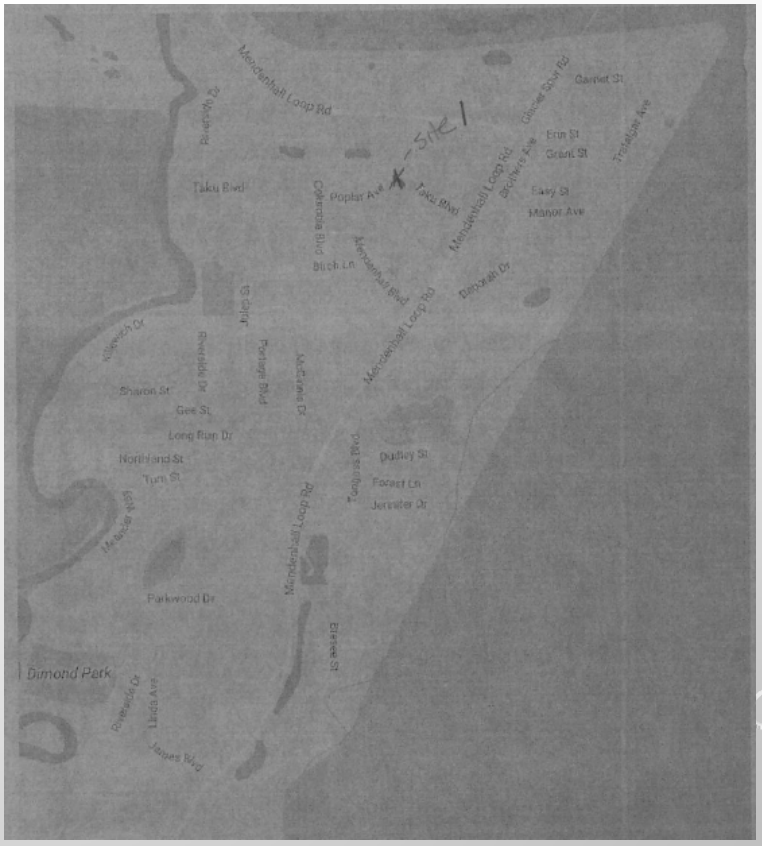
1 sample/mo	Routine sample location	Repeat sample location	GWR sample location
January	1) 1435 Main St. -DIST	1) (same as routine)	1) WL01- Source
		2) 1445 Main St. – DIST	2) WL02 - Source
		3) 1430 Main St. – DIST	
February	2) 123 Tripper Ln.-DIST	1) (same as routine)	1) WL01- Source
		2) 118 Tripper Ln.-DIST	2) WL02 - Source
		3) 126 Tripper Ln.-DIST	

SSP ISSUE 1 – SAMPLE SITE NAMES

- The name on the map needs to match the name on the spreadsheet
- Include an address as well as that it's from the distribution system
- If it is a triggered GWR sample – write source, or TR GWR, or something to indicate it isn't the distribution system sample
- In most cases, the sample site for RTCR is different than your nitrate sample location. If you use the same sample name, even though its from a different location please include DIST in the sample name (i.e., SP02-DIST)

SSP ISSUE 2 - MAPS





TRUE OR FALSE: IF A SYSTEM SUBMITS A PLAN WITH THEIR MAP LOOKING LIKE THIS, IS THAT A VIOLATION?

MONITORING

SAMPLE TYPES:

1. ROUTINE
2. REPEAT
3. SPECIAL

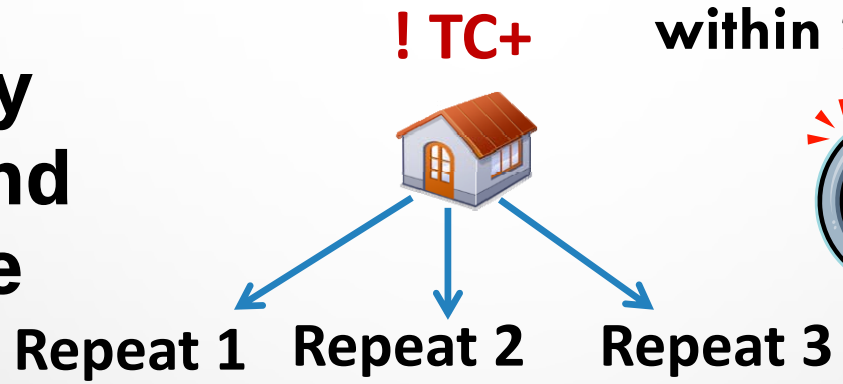
RTCR MONITORING:
REPEAT SAMPLES

- Samples must be collected based on the written Sample Siting Plan, including all routine and repeat sample locations.
- Routine Samples
  - All PWSs must collect routine total coliform samples each month
    - The number of samples collected for RTCR is dependent on the population served. The number of distribution systems may also be a factor.

PWS HAS A TOTAL COLIFORM BACTERIA POSITIVE SAMPLE…

TCR

Mandatory Sample and Re-sample



Repeat samples within 24 hours

RTCR

Mandatory Sample and Re-sample

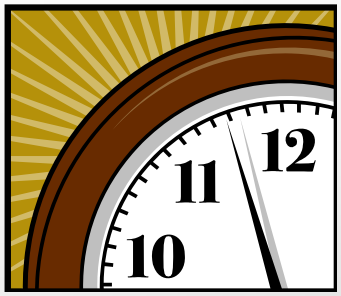
PLUS

Mandatory to Find and Fix Defects

Find and Fix within 1 month

RTCR MONITORING:
REPEAT SAMPLES

- Repeats need to be taken ASAP after a TC+ routine (ideally within 24 hours*).
- Repeats **MUST** be taken within 24 HOURS of notification of any EC+.

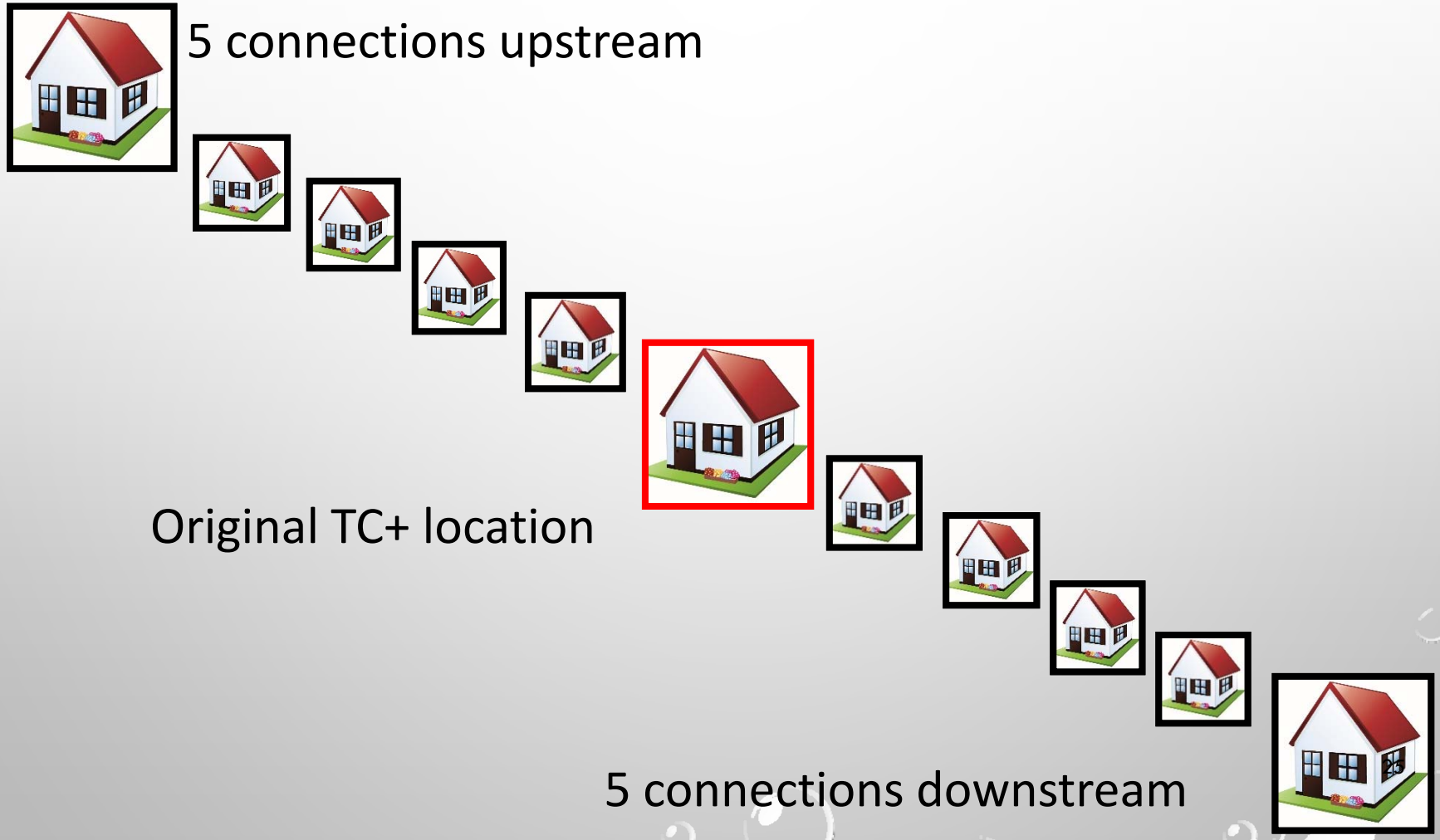


- Take repeats before shock chlorinating or taking other measures. You are just masking the problem otherwise!
- Collect an additional set of repeats for each repeat TC+.

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

TRUE OR FALSE: IS IT A VIOLATION IF A SYSTEM GETS TWO TC+ RESULTS?

RTCR MONITORING:
REPEAT SAMPLES



RTCR MONITORING:
REPEAT SAMPLES

5 connections Upstream
– **Upstairs bathroom - DIST**

5 connections Downstream – **Downstairs bathroom - DIST**

Original TC+ location –
Kitchen sink - DIST

RTCR MONITORING:
SAMPLE SITES TO AVOID

- Faucets connected to cisterns, softeners, pumps, pressure tanks or hot water heaters.
- New faucets or just repaired fixtures.
- Faucets positioned close to the sink or ground.
- Leaky faucets.
- Outdoor faucets
- Swivel faucets
- Automatic faucets that mix hot and cold water

RTCR MONITORING:
SAMPLE FAUCETS

- BEST TYPE OF FAUCETS:

RTCR MONITORING:
SAMPLE BOTTLES

- Use only clean, undisturbed containers supplied by a R8 certified lab.
- Container must be labeled properly (PWS number is required).
- **Keep extra bottles** on hand if repeats or re-samples are necessary.

TRUE OR FALSE: IF A SYSTEM IS NOTIFIED OF A ROUTINE TC+ AND DOESN'T COLLECT THEIR REPEATS UNTIL 3 DAYS LATER IT'S A MONITORING VIOLATION.

RTCR MONITORING:
SAMPLE BOTTLES

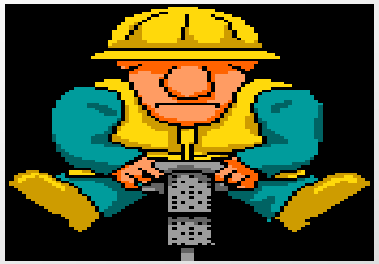
KEEP EXTRA BOTTLES ON HAND IF REPEATS OR RE-SAMPLES ARE NECESSARY.

THERE WILL BE NO TIME EXTENSION FROM THE 24-HR REPEAT REQUIREMENT IF YOU HAVE AN EC+.

RTCR MONITORING:

SPECIAL SAMPLES

Special samples during repairs will NOT count toward compliance.



➔Only if they are specified as "special" before they are analyzed.

➔Any sample marked "special" will not count towards compliance (i.e., Seasonal start up sample).

➔However, if you are doing work on your system you are still required to collect a compliance sample, if you mark it "special" you will receive a monitoring violation.

MONITORING

IMPORTANT INFORMATION TO REMEMBER!

RTCR MONITORING:
CHAIN OF CUSTODY

- Fill out lab slip completely.
- Indicate sample type (routine, repeat, or special).
- Write the date & time you took the sample.
- Sample location (RTCR samples always need to be in your DIST, unless they are the triggered GWR sample-TR GWR).
- **If you do not include ALL of this information you may receive a violation because EPA could not track your sample(s) results correctly.**

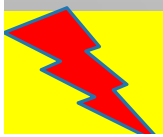
RTCR MONITORING:
30 HOUR HOLD TIME

- Time from when sample is collected until **the lab begins analysis** of the sample.
- Consider all mailing or transport options (including driving the sample in yourself).
- Samples over 30 hours **WILL NOT BE ACCEPTED BY EPA!!!**

SEASONAL SYSTEM START-UP REQUIREMENTS

NCWS that start-up and shutdown during the year must:

- Complete all EPA-required seasonal system start-up procedures prior to serving water to customers (including a “special” sample).
- Submit the seasonal start-up checklist which includes the certification form about completing the start-up procedures before water is served to the public.

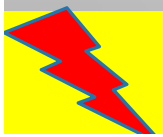


TRUE OR FALSE: IF THE SYSTEM SERVES WATER TO THE PUBLIC BEFORE COMPLETING THE SEASONAL START-UP CHECKLIST IS THAT A VIOLATION?

RTCR MONITORING:
SEASONAL SYSTEMS

- You must demonstrate completion of an EPA-approved start up procedure prior to opening for the season. You cannot open for the season without completing the form and submitting to the R8 office.
  - Again, monitoring will be required <u>monthly</u>. This is only for the months you are open. Even if you are only open part of the month.

<u>A "SPECIAL" START-UP SAMPLE CANNOT COUNT AS YOUR MONTHLY REQUIRED SAMPLE.</u>



TRUE OR FALSE: A WATER SYSTEM ONLY SERVES WATER FOR 2 WEEKS IN MAY, THEY STILL NEED TO COLLECT A ROUTINE SAMPLE FOR THE MONTH.

RTCR MONITORING:
WHAT HAPPENS IF I HAVE A TC+/*EC+* ROUTINE SAMPLE?

CONTACT EPA IMMEDIATELY

- **You MUST collect your repeat samples within 24 hours – NO EXCEPTIONS!!**
- ***EC*+ indicates there is a significant problem in your water system and people are liable to get sick.**

RTCR MONITORING:
WHAT HAPPENS IF I HAVE A TC+ ROUTINE AND TC+ REPEAT SAMPLES?

- No more monthly MCL violation (and the accompanying public notice required).
- All systems are now required to conduct an assessment when results show a PWS may be vulnerable to contamination (have TC+ results).

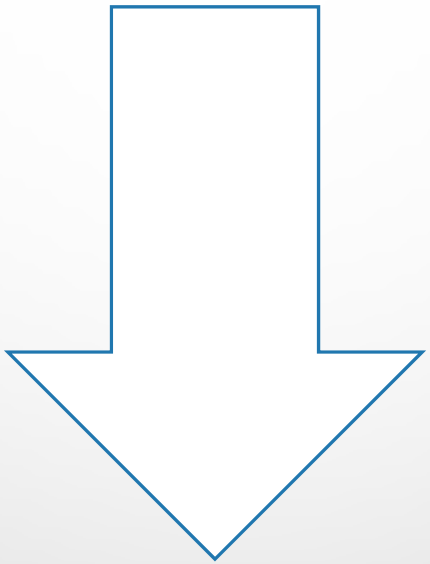
ASSESSMENT AND CORRECTIVE ACTION

ASSESSMENT AND CORRECTIVE ACTION

PWS required to conduct a Level 1 or Level 2 Assessment when certain conditions occur in the system. Problems (i.e.-Sanitary defects*) identified during the assessment must be corrected.

**SANITARY DEFECT- (1) A flaw that could provide a pathway of entry for microbial contamination in the DIST or; (2) indicates failure or imminent failure of a barrier that is already in place.*

TREATMENT TECHNIQUE (TT) TRIGGERS



Level 1 and Level 2 Assessments

PURPOSE OF ASSESSMENTS

- RTCR requires PWSs to investigate the system when monitoring results show the system may be vulnerable to contamination and correct any "sanitary defects" identified.
- Systems must conduct a basic assessment (Level 1) or a more detailed assessment by an R8 approved third party (Level 2) depending on the severity and frequency of contamination.
  - Failure to assess and/or correct a sanitary defect is a treatment technique (TT) **violation**

ELEMENTS OF ASSESSMENTS

At a minimum, assessment must include review and identification of:

1. **Events** that happened that could create impaired water quality
2. **Changes in distribution system O&M** that may affect distributed water quality, including water storage
3. **Source and treatment** considerations that bear on distributed water quality
4. **Inadequacies** in sample sites, sampling protocol, and sample processing
5. **Timeline** for fixing issues uncovered during the assessment

RTCR ASSESSMENTS

- Assessments must be completed “as soon as practical” after PWS was aware of trigger but shall not exceed 30 days.
- Any corrections already made prior to submission of the assessment must be listed on the assessment.
- Corrective actions not completed by the time of assessment submission, must be listed on the form with a suggested schedule of completion. If completion will be longer than 30 days the PWS **must** consult with EPA.

TRUE OR FALSE: A WATER SYSTEM FILLS OUT THE ASSESSMENT FORM BUT LEAVES THE CORRECTIVE ACTION SECTION BLANK. THIS IS AN MCL VIOLATION.

RTCR LEVEL 1 ASSESSMENT

Relatively simple evaluation of source water, treatment, distribution, and other operational practices.

- PWS **must** fix all sanitary defects found

What triggers a level 1 assessment?

- Having multiple TC+ samples in the same sample period (routines & repeats).
- Failure to take every required repeat sample after a single TC+ sample.
- Failure to collect all of the required repeats after a TC+.

RTCR LEVEL 2 ASSESSMENT

Considerably more detailed assessment conducted by an EPA R8 approved third party. Additional sampling, inspections, repair work, etc. could be required.

What triggers a level 2 assessment?

- *E. Coli* MCL violation (see later slide for definition).
- Second Level 1 Assessment triggered within a rolling 12 month period (multiple months of multiple TC+'s).
- If you don't collect all your repeats after a TC+/EC+ routine sample (also an MCL violation).

VIOLATIONS

(TREATMENT TECHNIQUE AND MCL)

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,
  - Failure to include any corrective action in any Level Assessment,
  - Failure to complete the corrective action identified in any level Assessment.

E. COLI MAXIMUM CONTAMINANT LEVEL VIOLATIONS

***E. COLI* MCL VIOLATION** (System is out of compliance if the following occur):

- ***EC+*** REPEAT FOLLOWING **TC+** ROUTINE
- **TC+** REPEAT FOLLOWING ***EC+*** ROUTINE
- PWS FAILS TO TAKE **ALL** REPEAT SAMPLES FOLLOWING AN ***EC+*** ROUTINE SAMPLE.
- PWS FAILS TO TEST FOR ***EC*** WHEN A ROUTINE SAMPLE IS **TC+**.

TRUE OR FALSE: AN MCL VIOLATION ISN'T AS SERIOUS AS A TREATMENT TECHNIQUE VIOLATION.

E. COLI MCL VIOLATIONS

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

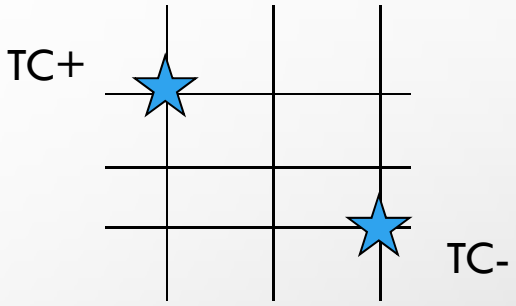
40 CFR 141.63 & 141.860(a)

E. COLI MCL VIOLATION REQUIREMENTS:

- NOTIFICATION TO EPA WITHIN 24 HOURS.
- IF THE MCL VIOLATION IS RELATED TO AN *EC*+ YOU MAY BE REQUIRED TO ISSUE A BOIL WATER ALERT AND PROVIDE AN ALTERNATIVE SOURCE OF WATER.
- WITHIN 30 DAYS, COMPLETE ALL OF THE FOLLOWING:
  - ✓ "FIND AND FIX" ALL SANITARY DEFECTS
  - ✓ COMPLETE AND SUBMIT LEVEL 2 ASSESSMENT FORM
  - ✓ PUBLIC NOTIFICATION

RTCR SAMPLING EXAMPLES

3 repeats are required at each TC+. (If system subject to the GWR a triggered GWR sample also required.)



Scenario A) **If all repeats are negative:**

- No further action, return to routine sampling next month.

Scenario B) **If any repeat sample is TC+:**

- Level 1 assessment triggered
- No further repeats needed

Scenario C) **If any repeat sample is *EC*+:**

- Notify EPA immediately
- Level 2 assessment triggered
- Acute ***E. coli*** **MCL violation**/Tier 1 PN

REPORTING AND RECORDKEEPING

REPORTING

PWSS ARE REQUIRED TO REPORT THE FOLLOWING WITHIN A REQUIRED TIMEFRAME:

- **MONITORING RESULTS**
- **EC+ ROUTINE SAMPLE: END OF DAY (WITHIN 24 HOURS)**
- **EC MCL VIOLATION: *END OF DAY (WITHIN 24 HOURS)***
- **TREATMENT TECHNIQUE VIOLATION**
- **COMPLETED ASSESSMENT FORM: 30 DAYS FROM TRIGGER**
- **COMPLETED CORRECTIVE ACTION: 30 DAYS OR STATE DETERMINED**
- **CERTIFICATION OF COMPLETION OF STATE-APPROVED START-UP PROCEDURES FOR SEASONAL SYSTEMS: BEFORE CUSTOMERS RECEIVE WATER**
- **CERTIFICATION OF COMPLIANCE WITH PN REQUIREMENTS**
- **FAILURE TO COMPLY WITH ANY OF THE RTCR REQUIREMENTS**

RECORDKEEPING

PWSS ARE REQUIRED TO KEEP RECORDS OF THE FOLLOWING WITHIN A REQUIRED TIMEFRAME:

- Monitoring results (Routine and Repeat)
- Sample siting plans
- Assessment forms and documentation of corrective actions completed
- Copies of PN issued
- Certifications

VIOLATIONS, PN, AND CCR

Violation	Tier of Public Notification
E. coli MCL Violation	Tier 1
Treatment Technique Violation	Tier 2
Monitoring Violation	Tier 3
Reporting Violation	Tier 3

CWSs are also required to issue CCRs. Some compliance / non-compliance activities under the RTCR must be included in the CCR.

QUESTIONS?

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