Revised Total Coliform Rule

2015 SC Rural Water Conference

South Carolina Department of Health and Environmental Control
Promoting and Protecting the Health of the Public and the Environment
Total Coliform Rule (TCR)

• Published in 1989, effective in 1990

• Applies to all public water systems
  ▪ Approximately 154,000 systems, serving 307 million people

• Requirements effective until Revised TCR (RTCR) takes effect on April 1, 2016
TCR

- Objective of the rule was to protect public health by monitoring distribution systems for the presence of microbial contaminants
  - Total Coliform
  - Fecal Coliform or *E. coli* analysis for all total coliform positive samples

- Public notification required for violations of the Maximum Contaminant Level (MCL) and monitoring & reporting requirements

- No requirement for assessment or corrective action
History of the RTCR

• **Six Year Review** 1996 Safe Drinking Water Act Amendments

• **Advisory Committee**
  - Convened in 2007
  - 15 stakeholder organizations
Advisory Committee Findings

• Total coliform is not a good indicator of public health risk
  ▪ Many total coliform organisms are not of fecal origin
  ▪ Positive samples were a source of confusion and erosion of consumer confidence

• *E. coli* is a more specific indicator of fecal contamination and potential harmful pathogens to humans
What Stays The Same?

- Applicability
- Sample siting plan
- Monitoring
  - Routine
  - Additional routine
  - Repeat
Applicability

- Applies to all community and non-community public water systems
  - Federally-defined (greater than 25 people or 15 taps)
  - State-defined systems will be held to same standards
Sample Siting Plan

- Sample plans are still required for new rule
- Systems (and/or contract labs) should perform all monitoring in accordance with sample plan
- More info in later slides
Routine monitoring:
Non-community Systems less than 1,000

- Systems must monitor quarterly
- Any total coliform positive = repeat monitoring
- Determine whether treatment technique triggers have been exceeded, complete assessment if required

- Reduced monitoring (annual)
  - Clean compliance history
  - Sanitary survey shows system is free of sanitary defects
  - DHEC site visit w/in 12 months

- Increased monitoring (monthly)
  - Level 2 assessment trigger (or 2 Level 1 triggers)
  - E. coli MCL violation
  - Coliform treatment technique violation
  - 2 monitor violations, or 1 monitor & a Level 1 trigger
## Routine Monitoring: Community Systems less than 1,000

- Systems must monitor monthly
- Any total coliform positive = repeat monitoring

<table>
<thead>
<tr>
<th>Reduced monitoring (quarterly)</th>
<th>Return to monthly monitoring</th>
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<tbody>
<tr>
<td>- Clean compliance history</td>
<td>- Level 2 assessment trigger (or 2 Level 1 triggers)</td>
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<tr>
<td>- Sanitary survey shows system is free of sanitary defects</td>
<td>- E. coli MCL violation</td>
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<td>- Meet at least one:</td>
<td>- Coliform treatment technique violation</td>
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<tr>
<td>- DHEC site visit w/in 12 months</td>
<td>- 2 monitoring violations w/in rolling 12 month period</td>
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<td>- Cross connection program</td>
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<td>- Continuous disinfection</td>
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<td>- 4-log removal or inactivation of viruses</td>
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<td>- Other equivalent barriers</td>
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Routine Monitoring:
All systems over 1,000

• Systems must monitor monthly

• No reduced monitoring

• Following any total coliform positive, repeat monitoring must be done

• Following any total coliform positive, additional monitoring must be done the following month

• Systems determine whether treatment technique triggers have been exceeded, complete assessment if required

• The monitoring frequency (samples per month) is based on the population served by the system
Repeat Monitoring

• If a sample is total coliform positive
  ▪ Collect set of repeats w/in 24 hours
  ▪ 3 samples per positive sample
  ▪ DHEC can NOT waive requirement for repeats

• Collect all samples on same day

• Collect additional repeats if any of the repeat samples is total coliform positive

• Continue to collect additional repeats until
  ▪ Coliform is not detected in the complete set; or
  ▪ Coliform treatment technique trigger is exceeded

• All routine and repeat samples used for compliance calculations
**Additional Routine Monitoring**

- Done the month following a total coliform positive
- At least 3 samples
- Collected either regular intervals or all on one day
- Additional samples MUST be used in compliance calculations
- Additional samples must be taken even if an Assessment is triggered
- DHEC can waive the requirement (site visit performed, problem found and fixed)
What’s New or Different?

- MCL for E Coli
- Sample Siting Plans
- Lab changes
- Triggers for further action
- Assessments
- Corrective actions
- Seasonal systems
- Violations
- Reporting
  - CCR
- Miscellaneous info
New MCL for E. coli

• Replaces total coliform MCL

• Better indicator of potential for human health risks

• More definitive
  ▪ “Total coliform is everywhere”
  ▪ Easier to trace EC origins, only comes from warm-blooded animals (mammals & birds)
E. Coli Testing

• A system must analyze for E. coli if any routine or repeat sample is total coliform positive

• If E. coli are present, system notifies DHEC by the end of the day
Sample Siting Plan

• The Plan is two parts, an SOP, and a System Map

• Plan identifies sample sites & collection schedule
  - Representative of water throughout system
  - Routine AND repeat sites AND any other sampling points necessary must be reflected in plan (maybe not on map)

• Samples must be collected at regular time intervals throughout the month
  - GW less than 5,000 may collect from different sites on single day
Sample Siting Plan

- DHEC will review plans during the sanitary survey
- Water systems do NOT need to submit the plans to DHEC, but
  - If you’d like us to review your plan, send it to us *before* the compliance date
- DHEC may review, revise, and approve repeat sampling
- System must demonstrate that the plan remains representative of water quality in the distribution system
Sample Siting Plan Elements

• Written procedures on how the plan is implemented (SOP)
  ▪ Includes sample collection procedures
  ▪ Criteria for selecting routine sampling locations
  ▪ Criteria for determining where to collect repeat samples

• System map
  ▪ Routine monitoring locations identified
  ▪ Line sizes, storage tanks, pump stations, etc
Lab Changes

- 100 ml sample volume
- Only need to determine presence or absence of total coliform & E. coli, not density
- Time from collection to test may not exceed 30 hours; systems encouraged (not required) to hold samples below 10° C
- If residual present, it must be neutralized w/ sodium thiosulfate
- Systems must conduct analyses in accordance w/ 40 CFR 141.852
- As always, compliance samples must be done by certified lab
Sample Invalidation

• DHEC *may* invalidate:
  - The lab establishes improper analysis
  - DHEC determines that the total positive was due to a domestic issue (based on repeat samples)
  - DHEC believes that a total positive was due to a circumstance or condition that does not reflect water quality

• A lab *must* invalidate:
  - Turbid culture in absence of gas production (multiple-tube)
  - Turbid culture in absence of acid reaction (P-A test)
  - Produces colonies TNTC (membrane filter technique)

If a lab invalidates, system must collect another sample at the same location w/in 24-hours
Treatment Technique Triggers

• Level 1 Trigger:
  ▪ 5% samples per month total coliform positive (when taking more than 40 samples/month)
  ▪ 2 or more TC+ samples (when taking less than 40 samples/month)
  ▪ System fails to take every repeat sample after a single TC+ sample
Treatment Technique Triggers

• Level 2 Trigger:
  ▪ E. Coli violation
  ▪ 2nd level 1 trigger w/in rolling 12-month period
  ▪ Level 1 trigger in 2 consecutive years (for systems on annual monitoring)
Assessments

• Based on coliform results, system must identify and correct or schedule corrections of sanitary defects (find & fix) within 30 days of trigger

• Level 1 assessment replaces non-acute violation under TCR
  ▪ Performed by water system

• Level 2 assessment is triggered by an *E.coli* MCL violation or a second Level 1 assessment trigger in a 12-month period
  ▪ Performed by State-approved party
Level 1 Assessment

• Completed as soon as practical after trigger

• Must describe
  ▪ Sanitary defects found, if any
  ▪ Corrective actions already completed
  ▪ Proposed timetable for actions not yet completed
  ▪ Assessment can also state that nothing was found

• Due to DHEC w/in 30 days after system learns of trigger

• When DHEC reviews assessment and determines it is not adequate
  ▪ Work with system to correct
  ▪ Could require revised assessment w/in 30 days
Level 2 Assessment

• System must ensure Level 2 assessment is conducted
  ▪ By DHEC; or party approved by DHEC

• System must comply with any expedited actions or additional requirements from DHEC in the case of an E. coli MCL violation

• Submit completed assessment w/in 30 days

• Must describe: sanitary defects, corrective actions already taken, timetable for actions not completed

• Can also note that no sanitary defects were identified
Corrective Action

• System must correct sanitary defects found through level 1 or 2 assessments

• For corrections not completed:
  ▪ DHEC to consult w/ system
  ▪ Mutually determine schedule
  ▪ System follow timetable for completing actions
  ▪ Notify DHEC when each action completed
Seasonal Systems

- All seasonal systems must complete DHEC-approved start-up procedure
- Must monitor every month in operation unless criteria met to monitor less frequently
- DHEC can exempt some of the requirements if the entire distribution system stays pressurized during the entire time the system is not operating
Violations
Violations

• E. coli violations:
  - E. coli positive repeat sample following a total coliform positive routine sample
  - Total coliform positive repeat following an E. coli positive routine
  - System fails to take all required repeat samples after an E. coli positive routine
  - System fails to test for E. coli when any repeat sample is total coliform positive
E. Coli MCL Violation

• EC-positive repeat sample following a TC-positive routine sample

• TC-positive repeat sample following an EC-positive routine sample

• Failure to take all required repeat samples following an EC-positive routine sample

• Failure to test for EC when any repeat sample is TC-positive
Violations

• Treatment Technique violations:
  - System exceeds trigger and fails to conduct assessment OR complete corrections w/in timeframe established
  - Seasonal system fails to complete DHEC approved start-up procedure prior to serving water to the public
Violations

- Monitoring violations:
  - Failure to take every required routine or additional routine sample
  - Failure to analyze for E. coli following a total coliform positive routine sample

- Reporting violations:
  - Failure to submit a monitoring report or completed assessment
  - Failure to notify DHEC after an E. coli positive
  - Failure to submit certification of completion of DHEC approved start up plan by seasonal system
Reporting
Reporting

- **E. coli:**
  - Notify DHEC by the end of the day for E. coli MCL violation
  - Notify DHEC by the end of the day for any routine sample is E. coli positive

- **Treatment technique:** a system that has violated a treatment technique must report to DHEC by the end of the next day

- **Assessments:** submit the report w/in 30 days

- **Monitoring:** system that fails to comply with a monitoring requirement must report to DHEC w/in 10 days

- **Seasonal systems:** report to DHEC that the start up plan has been completed
CCR Changes

• Must contain info on Level 1&2 assessments
  ▪ Mandatory language, fill in the blanks

• If E. coli is detected and violation occurred
  ▪ Mandatory language about why violation occurred
  ▪ One of the four violation situations

• If E. coli is detected, but no violation occurred
  ▪ System may include statement that it was detected, but no violation occurred

• Total number of E. coli positive samples
Miscellaneous Info
EPA’s Best Way To Compliance

• Wellhead protection from fecal contamination through well placement & construction
• Disinfection residual throughout distribution system (NOT required by DHEC)
• Proper distribution system maintenance (required by DHEC)
• Filtration/disinfection of surface water (required by DHEC)
• Compliance with DHEC Wellhead Protection Program
Public Notice

• Tier 1 Notice (ASAP) – violation of MCL for E. coli

• Tier 3 Notice (can be in annual CCR) – reporting & recordkeeping violations related to R-TCR
TCR Compliance in SC

- 365 violations since January 1, 2013
  - 218 non-acute violations
    (would be assessments under RTCR)
  - 15 acute violations
  - 132 monitoring & reporting violations