



**pennsylvania**  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Safe Drinking Water

# **Final Rulemaking: Disinfection Requirements Rule**

Environmental Quality Board Meeting  
December 12, 2017

Tom Wolf, Governor

Patrick McDonnell, Secretary

# History of Rulemaking

- This proposed rulemaking was originally included in the Draft Proposed Revised Total Coliform Rule (RTCR).
- On 4/21/2015, the EQB approved the proposed RTCR with modifications – which included splitting out the “non-RTCR” provisions for additional stakeholder input.
- Six meetings were held in May, June, & July 2015 to gather additional stakeholder input.

# History of Rulemaking

- The proposed Disinfection Requirements Rule was presented to EQB on 11/17/2015 and was published in the PA Bulletin on 2/20/2016 with a 60-day public comment period.
- Three public hearings were held. Comments were received from 20 commentators and IRRC.
- The draft final-form rulemaking was presented to TAC on 7/13/2017 and 8/24/2017; TAC provided recommendations on August 25, 2017.

# Background and Purpose

- Existing disinfectant residual requirements for distribution systems have not been updated since 1992 and only require the maintenance of a detectable residual that is defined as 0.02 mg/L.
- Existing requirements are not protective of public health and are not enforceable – the existing standard is below the minimum reporting level of 0.1 mg/L and represents a false positive reading.

# Purpose of Rulemaking

- Protect public health through a multi-barrier approach designed to guard against microbial contamination by ensuring the adequacy of treatment for the inactivation of microbial pathogens and the integrity of drinking water distribution systems.
- Incorporate minor clarifications needed to obtain primary enforcement authority (primacy).

# New Data Reviewed

- Six-Year Review 3: EPA conducted an occurrence analysis of microbial indicators paired with disinfectant residual data.
  - More than 5 million records from 34 states/tribes were included in the analysis.
  - EPA found there was lower rate of occurrence of Coliform/*E. coli* positive results as free or total chlorine residual increased.
  - EPA concluded that a “detectable” concentration may not be adequately protective of public health due to microbial pathogens.

# New Data Reviewed

- Heterotrophic Plate Count (HPC) requirements for other states.
- Findings from DEP's Distribution System Optimization Program.
- Disinfectant residual and microbial data submitted by 6 PA water systems.
  - Data indicate that a very small percentage (0.3 – 3%) of historical disinfectant residual levels would not have met a disinfectant residual of at least 0.15 mg/L (which rounds up to 0.2 mg/L)
- Additional cost information.

# Significant Provisions

1. Require water systems with filtration treatment to maintain a 0.20 mg/L disinfectant residual at the entry point.
2. Require monitoring and reporting of log inactivation values to ensure compliance with an existing treatment technique.
3. Require water systems that use chloramines to develop a nitrification control plan.



# Significant Provisions

4. Increase the minimum disinfectant residual in the distribution system from 0.02 to 0.2 mg/L (free or total chlorine).
  - Due to analytical method limitations and interferences there may be little to no active disinfectant actually present when disinfectant residuals are  $< 0.2$  mg/L.
  - Scientific studies and data support the fact that residuals of 0.2 mg/L are effective at inactivating *E. coli* and other pathogens.

# Applicability

- The CT/log inactivation monitoring and reporting requirements apply to all 353 filter plants which are operated by 319 water systems.
- Disinfectant residual requirements in the distribution system apply to all 1,949 community water systems, and 746 noncommunity water systems that have installed disinfection for a total of 2,695 water systems.

# Comparison to Other States

- At least 23 other states have more stringent distribution system disinfectant residual requirements.
- Nineteen of these states have disinfectant residual requirements that are  $\geq 0.2$  mg/L.
- From 2011 to 2014, the majority of these 19 states had lower percentages of water systems with coliform violations than Pennsylvania.

# Estimated Costs

- Entry Point Disinfectant Residual Data Recording:
  - Cost to upgrade to electronic recording devices is ~ \$1,500 for 10% of systems using paper chart recorders (11 systems).
  - $11 \times \$1,500 = \$16,500$
- Disinfectant Residuals in Distribution System:
  - 25% of water systems serving over 25,000 people (~20 systems) may need to install automatic flushing devices, tank mixers or booster chlorination stations.

# Estimated Costs

- Disinfectant Residuals in Distribution System:
  - Costs for automatic flushers ~ \$2,500
  - Costs for tank mixers ~ \$75,000
  - Costs for booster chlorination stations ~ \$250,000
  - Total estimated costs to the regulated community are as much as \$4,900,000 in capital costs and up to \$250,000 in annual operational expenses.
- Cost savings from avoidance of a disease outbreak is estimated at \$1.5 million.

# Significant Issues

## Public comments:

- The minimum distribution system disinfectant residual level of 0.2 mg/L should be lower.
  - No studies were received to support a lower number.
- Heterotrophic Plate Count (HPC) should be allowed as an alternate compliance criteria (ACC).
  - Most states with higher residual requirements do not allow HPC as an ACC.
- Compliance costs were underestimated.
  - Cost estimates were updated accordingly.

# Summary of Revisions

- Deferred implementation dates by 6 months to 1 year for distribution system disinfectant residual requirements. Allow system-specific schedules for more complex systems.
- Clarified the disinfectant residual compliance calculations:
  - For systems using on-line chlorine analyzers.
  - When both free and total chlorine residual measurements are conducted.
- Revised the requirements for BVRB systems to address EPA's comments.

# Implementation Strategy

- Monitoring Plan Form template and Technical Guidance.
- Classroom and web-based training to begin summer 2018.
- Technical assistance and outreach:
  - Operator Outreach Assistance Program.
  - Distribution System Optimization Program.
- Financial assistance through PennVest.





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