

# Recent EPA Activities Related to Cross Connections and Backflow

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27<sup>th</sup> Annual Cross Connection Control Conference  
 Daytona Beach, Florida  
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## Overview

- Microbial and Disinfection Byproducts Federal Advisory Committee
- EPA Cross Connection Control White Paper
- Total Coliform Rule and Distribution Systems Federal Advisory Committee
- Revised Total Coliform Rule
- Distribution Systems Research and Information Collection Partnership
- EPA Six-Year Review of Existing Regulations

## Microbial and Disinfection Byproducts Federal Advisory Committee

- Convened to provide recommendations for the Stage 2 Disinfectants/Disinfection Byproducts Rule (Stage 2) and the Long-Term 2 Enhanced Surface Water Treatment Rule (LT2) – March 1999 – September 2000
- Agreement in Principle included
  - Recognition that cross connections and backflow represent a significant public health risk
  - Recommendation that as part of the 6-year Review of the Total Coliform Rule EPA initiate a process for addressing cross connection control an backflow prevention requirements

## EPA Cross Connection Control White Paper

- Published in 2002
- Developed as a product of two expert workshops
- Review of existing literature, research and information on the occurrence, magnitude and nature of public health risks from cross connections and backflow



## EPA Cross Connection Control White Paper

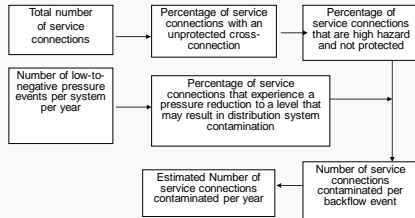
- Examples of Backsiphonage and Backpressure
- Factors Affecting Backflow
- Magnitude of Risks from Backflow
- Selected Backflow Incidents
- Other Information on the Impacts of Backflow Incidents
- Measures for Correcting and Preventing Backflow Problems
- Cross Connection Control Program Elements
- Indicators of Backflow Incidents





## Total Coliform Rule and Distribution Systems Federal Advisory Committee

- Modeling of the Potential for Exposure from Backflow Incidents Developed Following the White Paper Publication



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## Total Coliform Rule and Distribution Systems Federal Advisory Committee

- Federal Advisory Committee Convened from July 2007 – September 2008
  - Provide advice and make recommendations to the Agency on revisions to the Total Coliform Rule (TCR).
  - Consider what information about distribution systems is needed to better understand the public health impact from the degradation of drinking water quality in distribution systems.
  - Included 15 members representing perspectives from water utilities, public health organizations, consumer organizations, state and local governments, and environmental organizations

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## Total Coliform Rule and Distribution Systems Federal Advisory Committee

- January 2008 Meeting Focused Exclusively on Distribution System Issues
- Cross Connection Discussions:
  - Provided Background on Backflow, Summarized Some Incidents, and Provided an Overview of Codes and Statutes
  - Described Mitigation Strategies, State of Research and Public Health Impacts
- Discussions on Total Coliform Rule Focused on Cross Connections and Backflow as a Sanitary Defect



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## Total Coliform Rule and Distribution Systems Federal Advisory Committee

- Agreement in Principle
  - Provide a resource of cross connection control practices.
  - Recognize data gaps on public health linkages, extent of the problem and specific management tools
  - Form Research and Information Partnership to inform and support the drinking water community in future distribution system risk management decisions



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## Revised Total Coliform Rule

- Final Rule Published February 2013, Effective April 2016
- Requires Public Water Systems that are Vulnerable to Microbial Contamination to Identify and Fix Problems
- Interim State Guidance on Cross Connections and Backflow
  - The state may require a PWS to demonstrate that a cross-connection control program is in place.
  - Examples of sanitary defects include, but are not limited to:
    - Cross connections with privately owned wells that have not been properly disconnected
    - Insufficient minimum pressures within the distribution system that could allow back pressure or backsiphonage of contaminated water into the distribution system
    - Improperly inspected and maintained backflow prevention devices

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## Distribution Systems Research and Information Collection Partnership

- Partnership between EPA and the Water Research Foundation (2009-2016)



Partners Established a "science-driven, mutually-agreed-upon, strategically-focused, decision-relevant research and information collection agenda that encompasses short, medium, and long term research and information needs"

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## Distribution Systems Research and Information Collection Partnership

- Federal Advisory Committee Recognized Cross Connections and Backflow as being One of Four Tier 1 Distribution System Issues
  - Associated with documented health outcomes
  - Other Tier 1 Issues are Storage, Intrusion, and Contamination During Main Repair and Installation
- Developed a Priorities Document in April 2010 – 10 Priority Areas

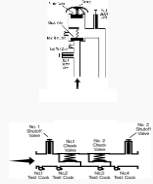


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## Distribution Systems Research and Information Collection Partnership

- Cross Connection Related Research and Information Collection Priorities
  - Best Practices to Minimize Risks Associated with Cross Connections and Backflow
  - Estimation of Contaminated Water Volumes and Contaminant Concentrations Introduced Into Distribution Systems Due to Backflow Events from Unprotected Cross Connections Based on Model Predictions and Field and Pilot-Scale Experiments



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## Distribution Systems Research and Information Collection Partnership

- Other Research and Information Collection Priorities Related to Cross Connections and Backflow
  - Propagation of pressure events
  - Distribution system pressure management
  - Quantitative microbial risk assessment on pathogens in distribution systems
  - Epidemiological studies of health effects from low pressure events
  - Large water system distribution system surveys
  - Surveys on State and local distribution system regulations, policies and guideline

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## Distribution Systems Research and Information Collection Partnership

- Summary Document on the State of Research
  - Published June 2016
- Some Remaining Gaps
  - Case studies on backflow events, storage contamination
  - Cross connection occurrence and program issues
  - National surveys on pressure management, occurrence of cross connection, backflow, etc.



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## EPA Six-Year Review of Existing Regulations

- Third Six-Year Review Decision Published January 11, 2017
  - Reviewed 76 National Primary Drinking Water Regulations (NPDWRs)
  - Eight regulations are candidates for revision
    - These regulations are contained within the Stage 1 Disinfection Byproducts Rule, the Stage 2 Disinfection Byproducts Rule, the Surface Water Treatment Rule, the Interim Enhanced Surface Water Treatment Rule, and the Long-Term 1 Enhanced Surface Water Treatment Rule
  - Comment period closes on March 13, 2017
  - Review decision initiates a more detailed analyses of factors relevant to deciding whether to revise an NPDWR

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## EPA Six-Year Review of Existing Regulations

- Review Decision for Microbial Rules Focused on Three Provisions
  - Requirements to maintain a minimum disinfectant residual in the distribution system
  - Ground Water Under the Direct Influence of Surface Water (GWUDI) classification
  - Disinfectant residual concentration and contact time (CT) criteria for virus disinfection
- Interim Enhanced Surface Water Treatment Rule and Long-Term 1 Enhanced Surface Water Treatment Rule Include Sanitary Survey Provisions

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## Summary

- EPA has had Several Cross Connections and Backflow Related Efforts in Recent Years
- EPA and Drinking Water Stakeholders have Identified Gaps in our Understanding of Cross Connections and Backflow
- Most Recent Activities have Focused on Filling these Gaps
- EPA has Addressed some Concerns Related to Cross Connections and Backflow through Revisions to the Total Coliform Rule
- EPA Recently Announced a Decision to Consider Revisions to Eight NPDWRs

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