

Drinking Water Question?  
CB



## Portsmouth Ohio Water Treatment Plant

*Drinking Water Requirements*

*City Council Meeting 1/23/2006*

As Presented By: Beth Pyles of Orica Watercare



## EPA Requirements

- *Safe Drinking Water Act (SDWA): the national law safeguarding tap water in America*
- *Under SDWA, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards.*
- *Currently 34 regulations covering about 90 contaminants*



128 (contaminants)



## U.S. Environmental Protection Agency

# Safe Drinking Water Act (SDWA)

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## Regulations & Guidance

### Current Drinking Water Rules (by date issued) (ALL ABOUT PDF FILES)

[Chart of key regulatory dates \(2000-2006\) PDF file](#)

- [National Primary Drinking Water Regulations: Analytical Method for Uranium](#)
- [Withdrawal of Direct Final Rule; National Primary Drinking Water Regulations: Analytical Method for Uranium](#)
- [National Primary Drinking Water Regulations: Minor Corrections and Clarification to Drinking Water Regulations; National Primary Drinking Water Regulations for Lead and Copper](#) (June 29, 2004)
- [National Primary and Secondary Drinking Water Regulations: Approval of Additional Method for the Detection of Coliforms and E. coli in Drinking Water; Final Rule](#) (February 13, 2004) ([HTML](#)) ([PDF](#))
- [Unregulated Contaminant Monitoring Regulation: Approval of Analytical Method for Aeromonas; National Primary and Secondary Drinking Water Regulations: Approval of Analytical Methods for Chemical and Microbiological Contaminants; Final Rule](#) (October 29, 2002) ([read online](#))
- [Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; National Primary Drinking Water Regulations; and National Secondary Drinking Water Regulations; Methods Update; Final Rule](#) (October 23, 2002) ([read online](#)) ([PDF](#)) ([Fact Sheet](#))
- [Unregulated Contaminant Monitoring Regulation for Public Water Systems; Establishment of Reporting Date: Direct Final Rule](#) (March 12, 2002) ([read online](#)) ~ ([PDF](#))
- [Long Term 1 Enhanced Surface Water Treatment Rule](#) (January 14, 2002) ([read online](#)) ~ ([PDF](#))
- [Unregulated Contaminant Monitoring Amendment to List 2 Rule and Delay of Reporting Monitoring Results](#) (September 4, 2001) - [Direct Final Rule](#)
- [Filter Backwash Recycling Rule](#) (June 8, 2001) ([read online](#)) ~ ([PDF](#))
- [Arsenic Rule](#) (Jan 22, 2001) ([read online](#))
- [Unregulated Contaminant Monitoring List 2 Rule](#) (Jan. 11, 2001) [HTML](#)
- [Radionuclides Rule](#) (Dec 7, 2000) ([HTML](#)) ~ ([PDF](#))
- [Drinking Water State Revolving Fund Rule](#) (Aug 7, 2000) ([HTML](#)) ~ ([PDF](#))
- [Removal of the MCLG for Chloroform](#) (May 30, 2000) ([HTML](#))
- [Public Notification Rule](#) (May 4, 2000) ([HTML](#)) ~ ([PDF](#))
- [Analytical Methods for Perchlorate and Acetochlor](#) (Mar 2, 2000) ([HTML](#))
- [Lead and Copper Rule minor revisions](#) (Dec 20, 1999) ([HTML](#))
- [Underground Injection Control Regulations for Class V Injection Wells](#) (Dec 7, 1999) ([HTML](#)) ~ ([PDF](#))
- [Analytical Methods for Chemical and Microbiological Contaminants and Revisions to Laboratory Certification Requirements](#) (Dec 1, 1999) ([HTML](#))
- [Revisions to the Unregulated Contaminant Monitoring Rule.](#) (Sep 17, 1999) ([HTML](#)) ~ ([PDF](#))
- [Suspension of Unregulated Contaminant Monitoring Requirements for small public water](#)

### Drinking Water Regulations

[Current Rules](#)

[Proposed Rules](#)

[Code of Federal Regulations](#)

[Guidance & Policy](#)

[Drinking Water Standards \(List of Contaminants & MCLs\)](#)

- systems (Jan 8, 1999) ([HTML](#))
- Interim Enhanced Surface Water Treatment Rule (Dec 16, 1998) ([HTML](#)) ~ ([PDF](#))
- Stage 1 Disinfectants and Disinfection Byproducts Rule (Dec 16, 1998) ([HTML](#)) ~ ([PDF](#))
- Consumer Confidence Report Rule (Aug 19, 1998) ([HTML](#)) ~ ([PDF](#))
- Variances and Exemptions Rule (Aug 14, 1998) ([HTML](#)) ~ ([PDF](#))
- [Drinking Water Contaminant Candidate List \(March 2, 1998\)](#)
- Revisions to State Primacy Requirements (April 28, 1998) ([HTML](#))
- Small System Compliance Technology List for the Surface Water Treatment Rule (Aug 6, 1997) ([PDF](#))
- Withdrawal of 1991 proposed rule on Radon-222 (Aug 6, 1997) ([HTML](#))
- Analytical Methods for Radionuclides (Mar 5, 1997) ([HTML](#))
- Information Collection Rule (May 14, 1996) ([HTML](#)) ~ ([PDF](#))
- [Stage 2 Disinfectants and Disinfection Byproducts Rule](#) (January 6, 2006)
- [National Primary Drinking Water Regulations: Long Term 2 Enhanced Surface Water Treatment Rule - Proposed Rule](#) (January 7, 2006)

organics  
causing

Cl<sub>2</sub> and LEAKS (ACID) FROM RAINOFF  
TOC

#### Proposed rules and other notices open for public comment

Newly proposed rules are listed on the [Open for Comment](#) page

#### Proposed Rules and Notices for which the comment period has closed (date closed)

- [Unregulated Contaminant Monitoring Regulation \(UCMR\) for Public Water Systems Revisions](#)
- [Agency Information Collection Activities: Proposed Collection; Comment Request; Laboratory Quality Assurance Evaluation Program for Analysis of Cryptosporidium Under the Safe Drinking Water Act, EPA ICR Number 2067.02, OMB Control Number 2040-0246](#)
- [Agency Information Collection Activities: Proposed Collection; Comment Request; Underground Injection Control \(UIC\) Program; EPA ICR No. 0370.18; OMB Control No. 2040-0042](#)
- [National Primary Drinking Water Regulations: Analytical Method for Uranium - Proposed Rule](#)
- [Disinfectants/Disinfection By-Products, Chemical, and Radionuclides Rules Information Collection Rule \(Renewal\)](#)
- [Microbial Rules Information Collection Rule \(Renewal\)](#)
- [Public Water System Supervision Program Information Collection Rule \(Renewal\)](#)
- [The Final Draft of the Tribal Drinking Water Operator Certification Program Guidelines is available and EPA is requesting comments](#)
- [Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; National Primary Drinking Water Regulations; and National Secondary Drinking Water Regulations; Analysis and Sampling Procedures - Proposed Rule](#)
  - [Federal Register Notice](#)
  - [More Information](#)
- [Drinking Water Contaminant Candidate List 2 \(June 1, 2004\)](#)
- [National Primary Drinking Water Regulations: Minor Corrections and Clarification to Drinking Water Regulations \(May 3, 2004\)](#)
- [Proposed Aeromonas and NPDWR Methods Rule](#) (May 6, 2002)
- [Proposed ground water rule](#) (August 9, 2000)
- [Proposed radon rule](#) (November 2, 1999)
- [Sulfate health effects study](#) (May 12, 1999)

Use Cl<sub>2</sub>

Reduce 50 ppm

↓  
LEAKS 100 ppm

**Code of Federal Regulations** (PDF files) -- The CFR compiles all rules currently in effect, and is updated annually as of July 1. To view or search these parts in a section-by-section format, or for other federal regulations, [visit the Government Printing Office \[EXIT disclaimer\]\(#\)](#) site. You can also try [GPO's new E-CFR \[EXIT disclaimer\]\(#\)](#), which is updated weekly. (ALL ABOUT PDF FILES)

- [National Primary Drinking Water Regulations](#) 40 CFR part 141
- [National Primary Drinking Water Regulations Implementation](#) 40 CFR part 142
- [National Secondary Drinking Water Regulations](#) 40 CFR part 143
- [Underground Injection Control Program](#) 40 CFR part 144
- [State UIC Program Requirements](#) 40 CFR part 145
- [Underground Injection Control Program Criteria & Standards](#) 40 CFR part 146
- [State Underground Injection Control Programs](#) 40 CFR part 147
- [Hazardous Waste Injection Restrictions](#) 40 CFR part 148
- [Sole Source Aquifers](#) 40 CFR part 149

### Guidance and Policy

- [Water Supply Guidance](#)
- [Quick Reference Guides](#)
  - [Standardized Monitoring Framework](#) (EPA 816-F-04-010 March 2004)
  - [Lead and Copper Rule: A Quick Reference Guide](#) (EPA 816-F-04-009 March 2004) (125 K PDF FILE)
- [Guidance on new rules:](#)
  - [Arsenic Rule](#)
  - [Consumer Confidence Report Rule](#)
  - [Lead and Copper Rule](#)
  - [Microbial and Disinfection Byproducts Rules](#)
  - [Public Notification Rule](#)
  - [Radionuclides Rules](#)
  - [Unregulated Contaminant Monitoring Rule](#)
- [Guidance for Small Systems](#)
- [Alternative Monitoring Guidelines](#)
- [Guidance on the Drinking Water State Revolving Fund Program](#)
- [Guidance on Analytical Methods for Drinking Water \(1998\)](#)
- [Manual for the Certification of Laboratories Analyzing Drinking Water](#)
- [Guidance on Data/Databases](#)
- [Guidance on State Source Water Assessment and Protection Programs \(1997\)](#)
- [Guidance for Future State Ground Water Protection Grants \(1997\)](#)

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Last updated on Sunday, January 22nd, 2006

URL: <http://D%3A/Data/bmhamm/Desktop/EPA%2520Ground%2520Water%2520%2526%2520Drinking%2520Water.htm>



## Regulated: Disinfection By-Product (DBP)

- Disinfectant (**chlorine**) react with naturally-occurring materials (TOC) in the water to form unintended byproducts, such as trihalomethanes and haloacetic acids, which may pose health risks
- DBP concentrations typically increase with distribution residence time.
- Some people who drink water containing DBPs in excess of EPA's standard over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.

\* 45,000 CUSTOMERS

EPA SLACK.



## Disinfection By Products Standards

- 1979-Trihalomethanes 100 ug/L
  - 4 locations sampled quarterly and averaged over 12 months
- 2001-Trihalomethanes 80 ug/L Haloacetic Acids 60 ug/L
  - 4 locations sampled quarterly and averaged over 12 months
  - DBP Precursors (TOC) required removal rate
- 2006- same limits as 2001 – compliance in stages (2012)
  - Same standard but at every location in the distribution system
  - Systems will conduct an evaluation of their distribution systems, known as an Initial Distribution System Evaluation (IDSE), to identify the locations with high DBP concentrations. These locations will then be used by the systems as the sampling sites for compliance monitoring

CONTAMINANTS  
REMOVED OUT  
OF WATER

WAIVER  
7 1/2 %

Required to  
REMOVED 35%



## How is Portsmouth's Drinking Water?

- To date has not had <sup>health based</sup> a violation
- EPA waiver on TOC removal: can not meet TOC removal requirements (35% - 13%) WAIVER @ 7 1/2 %
- Will not comply in six years if no changes made
  - Have been anticipating this since 2003



## Water Plant Evaluations 2002-2003

- Coagulants – alum vs. others
  - No improvement in TOC removal or DBP formation
  - Cheapest option but it did not work
- Ozone – may or may not work <sup>Fluoride 15¢ to 35¢ / gallon</sup>
  - Costly; electric and consumables \$0.15/1000 gallons of water treated
  - Require a lot of plant alterations to implement
- Granular Activated Carbon – will work <sup>NEED pumps, TURBOW-OUT/ADD NEW</sup>
  - Too costly; man power, electric and consumables \$0.10-0.20/1000 gal.
  - Requires additional filtration chambers – hard to implement
  - Reported reductions of TOC in Ohio River water following ozonation and biological filtration have ranged from 20 to 40%
- MIEX<sup>®</sup> DOC Resin – pilot tested 2003 – worked great
  - Least cost alternative \$0.09-0.10/1000 gallons of treated water
  - No alterations to existing facility, added as pretreatment
  - Pilot test resulted in 92% TOC reductions at Portsmouth's water plant

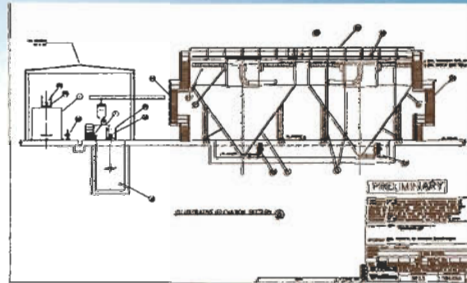


## MIEX<sup>®</sup> Treatment

- *Removes the naturally occurring organic matter (TOC) that reacts with chlorine to form DBPs through ion exchange*
- *Will achieve 90+% TOC removal (Plant 12-14%)*
- *Lowers DBPs: TTHMs 35ug/L and HAAs 20ug/L*
- *Reduces coagulant by 30% and disinfect by 30-50%*
- *Improves water quality while using less chemicals*



- 2003 Orica ran a pilot at water plant
- 2004/5 hired WesTech Engineers to conduct preliminary engineering report with detailed budget
- **March 2005, Sam and Ray visited a MIEX<sup>®</sup> Facility in Florida**
- **January 6, '06 Received Bids from design/build (DB) Teams**
- **Contract a DB Team – early Feb.**
- **Start construction summer**
- **Plant operational Dec. '06**





Questions?

