Ohio AWWA Section Technology Committee Update

> Ohio AWWA – Ohio WEA One Water Government and Regulatory Affairs Workshop Columbus, Ohio - March 9, 2017

Tim Wolfe, MWH - now part of Stantec Susan Schell, Ohio EPA DDAGW



## **Items to be Discussed Today**

 Two Major Documents Developed by the Ohio AWWA Technology Committee

 Why the Technology Committee Develops Guidelines / Checklists

 Guidelines / Checklists that have Been Developed

## **Other Items to be Discussed Today**

 Guidelines / Checklists that have Recently Been Developed

 Guidelines that have Been Revised by the Guidelines Review SubCommittee

Future Technology Committee Endeavors

## **Two Major Documents Developed by the Technology Committee**

## **First Major Type of Document**

- 1 Guidelines -Documents that establish:
- Required performance (approval) criteria, and
- Procedures for obtaining Ohio EPA approval of:
   WTP components with alternate design criteria



"Alternate" means different than Ten-States Standards (TSS) i.e., High-Rate, and Emerging Technologies

## **Second Major Type of Document**

- 2 Checklists -White papers that:
  - Summarize timely
    issues, concerns, etc.
    about a particular
    subject of interest to
    our Ohio water-supply
    community



## Why the Technology Committee Develops Guidelines

# **Guidelines are Developed for Two Principal Reasons**

1. So "High-rate" and "Emerging" Technologies can be approved by Ohio EPA more efficiently Cincinnati, Cleveland &

And . . .

Cincinnati, Cleveland & Columbus have collectively saved an estimated \$0.5B in Capital costs.



TIMOTHY WOLFE, YANN LE GOUELLEC, GARY HOPKINS, MAGGIE RODGERS, AND BRUCE WHITTEBERRY

Ohio AWWA Section's Technology Committee helps utilities save millions

TECHNOLOGY GUDELINES DEVELOPED FOR OHIO PUBLIC WATER SYSTEMS ARE ESTIMATED TO HAVE SAVED THE STATE'S THREE LARGEST SYSTEMS NEARLY \$0.5 BILLION OVER THE PAST 15-20 YEARS.

FEBRUARY 2014 | JOURNAL AWWA - 186 2

ajor capital-con savings have been achieved in Ohio during the pat two decades by the cities of Cleveland, Cincinnati, and Columbus as a result of guidelines produced by Ohio AWWAY Technology Communitee. Ohio AWWA and for nearly 20 years been jointly developing guidelines that provide agreedupon criteria by which technologies (i.e., those addressed in the Teri-State Standards (TSS) but with alternate design criteria or those not addressed in the TSS) are approved while continuing to appropriately consider public leadth concerns.

CAPITAL-COST SAVINGS BY OHIO'S THREE LARGEST PWSs It has been estimated that capital-cost savings for water projects in Ohio's three largest public water systems (PWSs) over the past 15-20 years are approaching 50.5 billion. These savings have been realized because high-rate conventional treatment processes and emerging technologies can now be considered and approved by OEPA, (High-rate conventional treatment

2. To help Ohio PWSs continue to

cost-effectively meet increasing customer demands for:

- water-quality (Regulatory driven), and
- water-quantity (Capacity driven) improvements

**Guidelines/Demo Studies Allow Ohio EPA** to Approve High-rate and Emerging Tech

**Ohio EPA Plan Approval of "Conv Tech"** 

**Detail Plans of TSS** (Conv) Technologies "Higher" Project Capital Cost

**Ohio EPA Demonstration Study Approval** 

DemonstrationConductDemonstrationStudy ProtocolDemo StudyStudy Report

**Ohio EPA Plan Approval of "H-r / Emerg. Tech"** 

Detail Plans of H-r / Emerg. Tech "Lower" Project Capital Cost **Guidelines/Demo Studies Allow Ohio EPA to Approve High-rate and Emerging Tech** 

**Ohio EPA Plan Approval of "Conv Tech"** 

**Detail Plans of TSS** (Conv) Technologies "Higher" Project Capital Cost



**Ohio EPA Plan Approval of "H-r / Emerg. Tech"** 

Detail Plans of H-r / Emerg. Tech "Lower" Project Capital Cost What are "High-rate" and "Emerging" Technologies ?

Ohio EPA's plan-approval process for both:

Water-supply Sources, and

• WTPs . . .

... is based on the "shall & must" statements of "Ten-States Standards (TSS)"

• "High-rate Technologies" are those operated at rates higher than allowed by TSS, and

• **"Emerging Technologies"** are those that are not adequately addressed in TSS

# **Ten States Standards (TSS) has Three Major Divisions**

This document includes the following:

1

Policy Statements - Preceding the standards are policy statements of the Board concerning water works design, practice, or resource protection. Some policy statements recommend an approach to the investigation of innovative treatment processes which have not been included as part of the standards because sufficient confirmation has not yet been documented to allow the establishment of specific limitations or design parameters. Other policy statements recommend approaches, alternatives or considerations in addressing a specific water supply issue and may not develop into standards.

2

Interim Standards - Following the policy statements are interim standards. The interim standards give design criteria which are currently being used for new treatment processes, but the use of the criteria is limited and insufficient for recognition as a recommended standard.

3

Recommended Standards - The Standards, consisting of proven technology, are intended to serve as a guide in the design and preparation of plans and specifications for public water supply systems, to suggest limiting values for items upon which an evaluation of such plans and specifications may be made by the reviewing authority, and to establish, as far as practicable, uniformity of practice. Because statutory requirements and legal authority pertaining to public water supplies are not uniform among the states, and since conditions and administrative procedures and policies also differ, the use of these standards must be adjusted to these variations.

## TSS's 1. Policy Statements and 2. Interim Standards can be Considered by Ohio during Plan Approval

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# **Ohio EPA Relies Heavily on TSS's 3. Recommended Standards**

oblems

PART	1 - SUBMISSION OF PLANS
1.0	GENERAL
1.1	ENGINEER'S REPORT
	1.1.1 General Information
	1.1.2 Extent of water works system
	1.1.3 Justification of project
	1.1.4 Soil, groundwater conditions, and foundation pr
	1.1.5 Water use data
	1.1.6 Flow requirements
	1.1.7 Sources of water supply
	1.1.8 Proposed treatment processes
	1.1.9 Sewerage system available
	1.1.10 Waste disposal
	1.1.11 Automation
	1.1.12 Project sites
	1.1.13 Financing
	1.1.14 Future extensions
	1.1.15 Technical, Managerial, and Financial Capacity
1.2	PLANS
	1.2.1 General layout
	1.2.2 Detailed plans
1.3	SPECIFICATIONS
1.4	DESIGN CRITERIA
1.5	REVISIONS TO APPROVED PLANS
1.6	ADDITIONAL INFORMATION REQUIRED
PART	2 - GENERAL DESIGN CONSIDERATIONS
2.0	GENERAL
2.1	DESIGN BASIS
2.2	PLANT LAYOUT
2.3	BUILDING LAYOUT
2.4	LOCATION OF STRUCTURES
2.5	ELECTRICAL CONTROLS

Requiring the "Shall and Must" Recommended Standards during Plan Approval

> 8 8

9 9

10 10 Former Emerging Technologies Currently Included in <u>2012</u>
3. Recommended Stds of TSS

Additions to TSS in 25 years of Ohio's Technology Committee's existence:

- Filtration rates have been increased from 2 gpm/sf to 2 4 gpm/sf, etc.
- Different types of filters are now acknowledged
- Design criteria for Tube-settler and Plate-settler units are now included
- Design criteria for Ozone systems now included

# Different Filter Types Acknowledged by 2012 TSS

#### 4.3 FILTRATION

Acceptable filters shall include, upon the discretion of the reviewing authority, the following types:

- rapid rate gravity filters (4.3.1);
- b. rapid rate pressure filters (4.3.2);
- c. diatomaceous earth filtration (4.3.3);
- d. slow sand filtration (4.3.4);
- e. direct filtration (4.3.5);
- f. deep bed rapid rate gravity filters (4.3.6);
- g. biologically active filters (4.3.7);
- h. membrane filtration (see Interim Standard on Membrane Technologies), and;
- bag and cartridge filters (see Policy Statement on Bag and Cartridge Filters for Public Water Systems).

The application of any one type must be supported by water quality data representing a reasonable period of time to characterize the variations in water quality. Pilot treatment studies may be required to demonstrate the applicability of the method of filtration proposed.

# Ozone Systems have Design Criteria in TSS 2012 Edition

#### 4.4.7 Ozone

4.4.7.1 Design considerations

Ozonation systems are generally used for the purpose of disinfection, oxidation and microflocculation. When applied, all of these reactions may occur but typically only one is the primary purpose for its use. The other reactions would become secondary benefits of the installation.

Effective disinfection occurs as demonstrated by the fact that the "CT" values for ozone, for inactivation of viruses and Giardia cysts, are considerably lower than the "CT" values for other disinfectants. In addition, recent research indicates that ozone can be an effective disinfectant for the inactivation of cryptosporidium. Microflocculation and enhanced filterability has been demonstrated for many water supplies but has not occurred in all waters. Oxidation of organic compounds such as color, taste and odor, and detergents and inorganic compounds such as

### **Copied from Ten States Standards**

## Why the Technology Committee Develops Checklists

Checklists are <u>also</u> Developed for Two Principal Reasons

 To provide useful information to Ohio PWSs about an important topic in a concise and timely manner – e.g., Algal toxins

### And ...

2. To also help Ohio PWSs continue providing high quality drinking water to customers in a cost-effective manner – e.g., optimize existing treatment

# **Guidelines that have Been Developed**

# 2 High-rate and 6 Emerg Tech Guidelines already Developed

- ENG-01-003: Guidelines for Clarifier and Granular Media Filter Ratings at Surface Water Treatment Plants
- ENG-02-001: Guidelines for Treatment Process Ratings at Precipitative (e.g., Lime) Softening Ground Water Plants
- ENG-03-002: Detail Plan Submission Guidance for Non-community Public Water Systems
- ENG-05-001: Guidelines for Obtaining Approval of Membranes to Meet Particulate and Microbiological Removal Requirements for Surface Water
- ENG-06-001: Guideline for Evaluation and Implementation of Chloramination
- ENG-07-001: Guidelines for Obtaining Approval of Membranes to Meet Treatment Requirements for Ground Water Treatment
- ENG-08-002: Policy for Determining the Acceptability of ASTM Pipe in Lieu of AWWA Pipe for Public Water Systems
- ENG-09-001: Guidelines for Evaluating Granular Activated Carbon (GAC) for Disinfection By-product (DBP) Precursor Removal

# 4 More Emerging Tech and 1 More High-rate Guidelines already Developed (cont)

- ENG-10-001: Guidance for Installation of Automatic Flush Hydrants in Distribution Systems
- ENG-12-001: Guidelines for Demonstration of On-site Sodium Hypochlorite Generators to Meet Inactivation/Disinfection Requirements of Drinking Water
- ENG-13-001: Guidelines for Obtaining Secondary Filtration Credit for Compliance with the LT2 Rule
- ENG-16-001: Guidelines for Agreements for Self-Certification of Distribution System Plans by Public Water Systems
- ENG-18-001: Guidance for High Rate Filtration for Iron and Manganese Removal at Groundwater Treatment Plants

### **Copied from Ohio EPA's website**

## **Overview of the Guidelines**

### **Standard Contents:**

- Purpose
- Background and Objectives
- Other Applicable Guidance
- Procedures
  - 1. General criteria
  - 2. Demonstration study criteria
  - 3. Approval criteria

High-rate Tech Guidelines

Then

**Emerging Tech Guidelines** 

Plan Approval Guidelines And, Finally

# A Guideline's "Procedures" Section has Three Sets of Criteria

- 1 General Criteria establish "shall / must" TSS Design criteria, etc.
- 2 Demonstration Study Criteria recommend Demo study procedures to be followed to obtain Ohio EPA approval for a High-rate or Emerging Technology

1) General and 2) **Demonstration Study Criteria** are Recommendations LVVV

## **The Procedures Section** (cont)

- 3 Approval Criteria are the Parameters:
- Agreed upon in the Guidelines between
  Ohio AWWA and
  Ohio EPA, and
- Agreed upon in a Protocol between the PWS and Ohio EPA prior to the Demo Study, and

3) Approval Criteria Wording is Carefully Developed

With which Demo
Study results are
compared to obtain
Agency approval of
the High-rate or
Emerging Tech

# **"Other Guidance" that has Been Developed by Ohio EPA**

### ASTM AWWA Pipe Policy

Guidance for Installation of **Automatic Flush Hydrants** in Distribution Systems

#### Environmental

Protection Agency Division of Drinking and Ground Waters

#### THIS POLICY DOES NOT HAVE THE FORCE OF LAW

Policy for Determining the Acceptability of ASTM pipe in lieu of AWWA pipe for Public Water Systems

Division: DDAGW Number ENG-08-002 Category: Engineering - Policy Status: Final Issued: November 4, 2010

#### PURPOSE

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The purpose of this policy is to establish standard criteria which may allow public water systems to use American Society for Testing and Materials (ASTM) pipe in lieu of American Water Works Association (AWWA) pipe.

#### BACKGROUND AND OBJECTIVES ....

Changes made between the 1997 and 2003 editions of the Recommended Standards for Water Works (Ten States Standards), effectively eliminated the allowable use of non-AWWA pipe for pipe 4 inches in diameter or greater.

The 1997 edition, Section 8.0.1 Standards and materials selection stated "Pipe, fittings, valves and fire hydrants shall conform to the latest standards issued by the AWWA and/or NSF, if such standards exist, and be acceptable to the reviewing authority ... " (Bold added for emphasis)

The 2003 edition, Section 8.1.1 Standards and materials selection states "a. All materials including pipe, fittings, valves and fire hydrants shall conform to the latest standards issued by the AWWA and ANSI/NSF, where such standards exist, and be acceptable to the reviewing authority ... " (Bold added for emphasis)

In actuality, the use of ASTM pipe continued to be approved by several of the member states, including Ohio. As such, the latest revision to the Ten States Standards again incorporates the use of ASTM pipe.

The 2007 edition, Section 8.1.1 Standards and materials selection states "a. All materials including pipe, fittings, valves and fire hydrants shall conform to the latest standards issued by the ASTM, AWWA and ANSI/NSF, where such standards exist, and be acceptable to the reviewing authority ... " (Bold added for emphasis)

As such, the objective of this policy is to provide well defined criteria for when the use of ASTM pipe may be "acceptable to the reviewing authority"so its use can be consistently reviewed across the state.

#### Specifications:

The AWWA C900 standard includes manufacturing, quality-control standards and pressure classes for PVC pipe from 4 inches to 12 inches in diameter. AWWA Standard C605 addresses

Page 1 of 6

"Plan-approval" Guidance Developed by Technology Comm

 Ohio EPA Plan Review Procedures for Drinking Water Facilities (i.e., Community Public Water Systems, PWSs)

 Detail Plan Submission Guidance for Non-Community PWSs

## **The Plan Review Procedures are Overall Guidance for "Community" PWSs**

- Introduction
- Pre-Design Activities
- Design Preparation and Plan Review
- Construction
- Appendix A -Agency fees and performance goals
- Appendix B -**Reference** documents used for plan approval

**Those Ohio EPA uses to review** and approve your Detail plans



OHIO EPA PLAN REVIEW PROCEDURES

The Plan Review Procedures have been Revised Twice

### • First Revision (~2004)

 Appendix B was added – a list of reference documents used by Ohio EPA for Plan Approval

 Appendix C was added – a list of items required on detail plans submitted for Plan approval early for Design-build projects

Second Revision (~2014)

Appendix C was revised, and now applies to both
 Design-build and Design, bid build projects
 (Can save 6 – 9 months on a project schedule )

# The Detail Plan Submission Guidance is for "Non-Community" PWSs

- This guidance was developed to prioritize the circumstances requiring plan approval.
- Non-Community PWSs tend to change more frequently, and can go in and out of existence fairly quickly and easily.

Ohio Environmental Protection Agency

Detail Plan Submission Guidance for Noncommunity Public Water Systems Division: DDAGW Number: ENG-03-002 Category: Engineering - Guidance Status: Final Issued: July 16, 2010

#### I. PURPOSE:

The purpose of this document is to provide guidance to staff of the Division of Drinking and Ground Waters (DDAGW) and the regulated community regarding prioritization of division resources to enforce the general requirement for detail plans to be approved by the Ohio EPA prior to any construction, installation or substantial changes being made to a public water system. This guidance was developed primarily to address noncommunity public water systems.

#### II. BACKGROUND:

In accordance with Ohio Revised Code Section 6109.07 (effective 12-14-78), "No person shall begin construction or installation of a public water system, or make a substantial change in a public water system, until plans therefor have been approved by the director of environmental protection ...". Although this has been enforced with general consistency for community public water systems, due to the nature of noncommunity public water systems, consistent enforcement of the requirement for noncommunity public water systems has not been achieved. The nature of a noncommunity public water system is different from a community water system in that they tend to change more frequently with respect to ownership, management, occupancy, type, size, etc. and they can go in and out of existence fairly quickly and easily. All of this can happen without the Ohio EPA having prior knowledge. Also, pre-existing noncommunity public water systems are still actively being identified and introduced to the drinking water program.

Resource limitations make it practically impossible to pursue and process detail plans, at one time, for every public water system that has not submitted detail plans. Therefore, this guidance has been developed to clarify what the DDAGW considers to be appropriate prioritization of circumstances requiring plan approval. The basis for the prioritization outlined in this guidance is to effectively utilize DDAGW's limited resources to provide the greatest benefit to human health and safety and to provide a framework for manageable and consistent application of the statute. It does not address every possible situation, but only those that tend to occur more frequently.

# Submission Guidance for "Non-Community" PWSs (cont)

 Pre-existing non-community PWSs are still actively being identified and introduced to the Ohio EPA drinking water program.

• The plan-approval process must include formal well site acceptance for all cases except "discovered" wells (i.e., a well in operation when Ohio EPA discovers the system that meets the definition of a PWS).

# "Plan-approval" Guidance that has Been Adopted into Rule

- Approved Capacity Document
  - Questions & Answers
  - Water Production Projections Worksheet
- GLUMRB Recommended Standards for Water Works – "Ten-States Standards, TSS"
- Guidelines for Design of Small Public Water Systems – "Greenbook"
- Guidelines for Arsenic Removal Treatment for Small Public Water Systems

# **Approved Capacity Document**

- I. Purpose
- II. Background and Objectives
- **III.** Other Applicable References
- **IV.** Definitions
- V. Approved Capacity Requirements
- VI. Planning Criteria
- VII. Design Criteria for Boal Determining Component Capacity

**Plan approval now includes both WTPs and Water-supply Sources** 

• Was developed in close collaboration with Ohio AWWA Technology Comm.

March 2010

Environmental Protection Agency

Approved Capacity

Planning and Design Criteria for Establishing Approved Capacity for: 1) Surface Water And Ground

vision of Drinking and Ground Waters

- First Guideline to become a Rule
- Was approved by the Governing Board of the Ohio AWWA Section

Ted Strickland, Governor Lee Fisher, Lt. Governor Chris Korleski, Director

# Checklists that have Been Developed

# Checklists that have Been Developed

 Checklist for Preliminary Submittals of Design-Build Water Treatment Plant Projects (Appendix C for First "Revision" of
 Ohio EPA Plan Review
 Procedures)



 Checklist for Review and Optimization of Treatment for Protection Against Waterborne Disease

# And, there's a White Paper on Disinfection with Hypochlorites

- Introduction
- Hypochlorite chemistry
- Storage
- Decision to convert from gas chlorine to hypochlorite
- Design considerations
- System operation

AWWA Ohio Section Technology Committee

White Paper on Disinfection with Hypochlorites

September 17, 2007

#### 1.0 INTRODUCTION

Theoretically, hypochlorite chemicals can be used wherever gaseous chlorine is used for disinfection. In the water supply practice, it has achieved widespread acceptance since its initial uses in early water treatment history. Hypochlorites can be purchased or generated on site.

It is appropriate to use hypochlorites as a disinfectant in place of gaseous chlorine when operational, financial, availability or safety considerations show that it is more advantageous to the operational staff. If staff feels that the decision to switch to hypochlorites is difficult, it is strongly recommended that they seek advice from Ohio EPA, another utility that has already made the conversion, or an engineering consultant. The changeover will require Ohio EPA approval.

#### 2.0 HYPOCHLORITE CHEMISTRY

#### 2.1 Hypochlorite vs. Gaseous chlorine

Disinfection with chlorine products is aimed at the formation of hypochlorous acid, which is a strong disinfectant. Gaseous chlorine dissolves in water to form hypochlorous acid and hydrochloric acid. The chemical formula for this reaction is:

 $Cl_2 + H_2O \rightarrow HOCL + HCL$ 

When hypochlorite compounds are used in place of gaseous chlorine, hypochlorous acid and sodium hydroxide are formed:

#### $NaOCl + H_2O \rightarrow HOCl + NaOH$

In either case, the HOCl that is formed dissociates into  $H^+$  and OCl. The OCl portion of the dissociation determines the disinfectant power of the water in which it resides. At a pH of 7.3 there is roughly a 50-50 concentration of the HOCl and OCl. As pH increases, the OCl predominates and the result is less disinfectant power.

#### 2.2 Demand Testing

Most waters will exert an oxidant demand, and so the operator needs to be able to meet the demand with sufficient dosage to overcome it before an excess of disinfectant (residual) can be

## **Guidelines / Checklists that have Recently Been Developed**

**Recent Technology Committee SubCom Topics Addressed** 

- Algal Toxin Treatment White Paper
- Aeration to Remove THMs White Paper
- Non-Potable Water
- Backflow Prevention
- Depressurization
- Multi-Barrier Microbial Reduction

### **Algal Toxin Treatment White Paper**

### **Topics:**

- Introduction
- Treatment
  - Source water
  - Conventional
  - Additional techniques
- Residual-handling Issues
- Other Resources

Algal Toxin Treatment White Paper Ohio AWWA Technology Committee

> Presented By: David B. Kohlmeier, P.E. CTI Engineers, Inc.

Ohio AWWA 2014 SDWA Seminar Worthington, Ohio December 8, 2014

### White Paper on Cyanotoxin Treatment



American Water Works Association Ohio Section Technology Committee



#### DRAFT WHITE PAPER ON CYANOTOXIN TREATMENT August, 2015

#### Introduction

Cyanobacteria (also known as blue-green algae) are microscopic organisms found naturally in surface water. True algae and cyanobacteria both utilize some form of chlorophyll to perform photosynthesis. True algae are essentially plants. Cyanobacteria are actually photosynthesizing bacteria. Cyanobacteria also contain the accessory pigment phycocyanin, that can give decaying blue-green algae a blue color. Some of the most commonly occurring cyanobacteria in Ohio waters include: microcystis, anabaena, pseudoanabaena, planktothrix, aphanizomenon, and cylindrospermopsis. True algae and cyanobacteria are very different organisms and therefore should not be treated the same. There are no known harmful toxins released by dying true algae. Cyanobacteria, however, can contain harmful cyanotoxins within the cell wall which may be released during cell growth or death.

Some species of cyanobacteria can produce cyanotoxins, including neurotoxins (nervous systems), hepatotoxins (liver) and dermatotoxins (skin irritant). Monitoring for cyanotoxins in Obio is

### **Cyanotoxin White Paper (cont)**

### Treatment – General Rule

• In general, the most effective way to remove algal toxins is while they are still encased within the intact algal cells.

• Once toxins are released from the cells they are much more difficult to remove.

 So the most efficient and cost effective method for toxin removal includes optimization of current treatment processes for <u>cell</u> removal.

## White Paper on Aeration to Reduce Trihalomethanes (THMs)

AWWA Ohio Section Technology Committee

White Paper on Aeration to Reduce Trihalomethanes

November 30, 2013

#### 1. Introduction

With the implementation of Stage 2 – Disinfectants/Disinfection Byproducts Rule and increased public concern about disinfection byproducts (DBPs) and chemicals in general, water systems are searching for alternative methods to reduce disinfection byproducts to maintain compliance and to reduce public exposure to DBPs. The primary method for reducing DBPs is to reduce natural organic matter (NOM) via treatment processes at the water treatment plant prior to chlorination. Another method for reducing DBP levels is the reduction of previously formed DBPs in the distribution system. Distribution systems with high water age, especially consecutive systems, are particularly prone to excessive THM concentrations.

Research has shown that tribalomethanes (THMs), one group of DBPs, are very suscentible to

Compound	Henry's Constant Atmospheres at 20 C
Chloroform	170
Bromodichloromethane	118
Dibromochloromethane	47
Bromoform	35

### White Paper on Aeration (cont)

 Offers Guidance and Education for Water Systems to Remove THMs in Clearwells or Storage Tanks



## White Paper on Use of Non-potable Water

- Outlines Strategies and Guidance on Using Non-Potable Water
  - Water Reuse
  - Dual Plumbing Systems
  - Purple Pipes
  - Cisterns

**Revision of Backflow Prevention Requirements** 

### **Purpose**

- To Clarify / Reduce the Requirements for Air Gaps / Backflow Preventers in Plan Approval
- <u>Air Gaps</u>
- When Air Gaps Are Required, a "Simplified" rectangular weir equation can be applied and a 1-inch safety factor added to the calculated water level result
- Air Gaps Still Required Where Sanitary Sewer is Final Destination

## **Depressurization Subcommittee**



#### (THIS POLICY DOES NOT HAVE THE FORCE OF LAW)

Policy for Evaluating and Responding to Water Distribution Systems and Subsystems that have Depressurized Division: DDAGW Number: OPR-06-001 Category: Operational - Policy Status: Final Issued: January 2, 2008

#### I. PURPOSE:

This document is intended to provide a policy to public water systems and Ohio EPA staff for evaluating and responding to possible contamination of water distribution systems and subsystems during depressurization events caused by a physical disruption (i.e. line breaks, valve repairs, new construction, etc.) or an operational disruption (i.e. pump failure, power

### **Depressurization Subcommittee (cont)**

- Goal: Put These Documents into a Workable
- Type 1: Positive Pressure Maintained
- Type 2: Positive Pressure Maintained, then Controlled Shutdown
- Type 3: Loss of Pressure at Break Site / Possible Local Depressurization For Instance:
- Type 4: Widespread Depressurization

	Main Brea	k Types and Responses			
Type 1 Break	Type 2 Break	Type 3 Break	Type 4 Break		
Positive pressure maintained during break	Positive pressure maintained during break	Loss of pressure at break site/ possible local depressurization adjacent to the break	Loss of pressure at break site/ widespread depressurization in the system		
Pressure maintained during repair	Pressure maintained until controlled shutdown	Partial or un-controlled shutdown	Catastrophic event/failure		
No signs of contamination intrusion	No signs of contamination intrusion	Possible contamination intrusion	Possible/ actual contamination intrusion		
Procedures	Procedures	Procedures	Procedures		
Excavate to below break	Excavate to below break	Uncontrolled shutdown	Catastrophic failure respons		
Maintain pit water level below break	Maintain pit water level below break	Document possible contamination	Document possible contamination		
Repair under pressure	Controlled shutdown	Disinfect repair parts	Shut-off customer services in affected area		
Disinfect repair parts	Disinfect repair parts	Conduct scour flush (3 ft/sec for 3 pipe volumes)	Disinfect repair parts		
Check residual disinfectant level in distribution system	Conduct low velocity flush (flush 3 pipe volume)	Conduct slug chlorination (CT of 100 mg/L-min <sup>3</sup> )	Conduct scour flush (3 ft/sec for 3 pipe volumes)		
No Boil Water Advisory (BWA)	Check residual disinfectant level in distribution system	Check residual disinfectant level in distribution system and ensure it is adequate	Conduct slug chlorination (CT of 100 mg/L-min <sup>3</sup> )		
No bacteriological samples	No Boil Water Advisory (BWA)	Instruct customers to flush premise plumbing upon return to service	Instruct customers to flush premise plumbing upon return to service		
adabar abar	No bacteriological samples	BWA – TBD; based on depressurization extent and presence of contamination <sup>1,2</sup>	Check residual disinfectant level in distribution system and ensure it is adequate		
	and the of 1921 at a state of the state	Bacteriological samples - TBD; based on depressurization extent and presence of contamination <sup>1,2</sup>	Issue BWA/ Boil Water Notice or "Do Not Drink" Order		
an alabata na		Subscription of the subscription	Bacteriological sampling required		

City of Columbus (800+ breaks/year)

- Type 1: 5% of breaks
- Type 2: 95% of breaks
- Type 3: 0% of breaks
- Type 4: 0% of breaks
  WRF Study Recommends No Bact. Samples for Type 1 and 2 Breaks

## **"Draft" Multi-Barrier, Microbial-reduction White Paper**

- Enhance Public health by Incentivizing PWSs to add Additional Treatment (e.g., UV, etc.).
- Federal Rule defines "post-filtration" UV and does not indicate set turbidity level where UV becomes less efficient.
- Subcommittee working with the OSU Water Resources
   Center to determine if a combined, filtered-water turbidity exceedance reduces UV effectiveness at < 5 NTU.</li>
- Perhaps Incentivize additional Treatment by allowing Public notification language to be softened following a combined, filtered-water turbidity exceedance

## **Guidelines that have been Revised by Ohio AWWA / EPA**

Membranes to meet Treatment Requirements for Ground Water

### **Significant Revisions:**

• A demonstration study is not required if the membrane is being used to remove hardness

• The number of water-quality parameters, and the frequency of sample collection has been reduced

# **Clarifier and Filter Ratings at Surface Water Treatment Plants**

### **Significant Revisions:**

- Filter media that meets TSS criteria:
  - dual-media,
  - -24 30 in. of media, and
  - $\ge 12$  in. of media with an effective size (e.s.) of 0.45-0.55 mm

are automatically approved at 4 gpm/sf

• i.e., No demonstration study required

Clarifier and Filter Ratings at Surface WTPs (cont)

- Length of time for a demonstration study has been changed from:
  - Four, 2-week seasonal periods
    - to
  - One, 6-week period

• Engineering submission required to justify not demonstrating most challenging water

**Clarifier and Filter Ratings at Surface WTPs** (cont)

• Eliminated need to monitor particle counts for low-turbidity source waters

Discussing elimination of demonstration study for media that meets TSS, but has:
-> 30 in. of media, and/or
- < 12 in. of media with an e.s. of 0.45-0.55 mm</li>
if L / d ratio (media depth / e.s.) ≥ 1,000

# And . . . You can find all this Good Stuff on Ohio EPA's Website

http://epa.ohio.gov/ddagw/rules.aspx#115095425-engineering

## **Future Technology Committee Endeavors**

## **Guidelines** Awareness Training

- Technology Committee and Ohio EPA are periodically presenting so more PWSs and Design engineers are familiar with:
  - existence of the Guidelines, and
  - content of the Guidelines

i.e., Today's Presentation

**Other Items the Technology Committee is Working on** 

- Design Criteria that would Eliminate the need for Demo Studies, either added:
  - to the Approved Capacity document, or
  - in The Ohio State Standards (TOSS), A future Ohio document that would address additional Capacity issues during the Plan-approval process

**Bottom Line** – Plan approval for Emerging technologies without a Demo study

**Procedures are Being Discussed to Develop Design Criteria** 

- These Design criteria for Emerging technology, as a Supplement to TSS:
  - would position Ohio EPA to grant plan approval without the PWS having to conduct a bench-, pilotor full-scale demonstration study
  - and . . .
  - make it possible for <u>small and medium-sized</u>
     Ohio PWSs to avoid costly Demo studies and therefore install cost-effective Emerg technology

# **Initial Approach the Emerging Technology SubCom is Considering**

- 1. Identify "Emerging technologies" most desired by Ohio PWSs (e.g.,):
  - high-rate clarification (ballasted flocculation units, plate settlers, Superpulsators, dissolved-air flotation, etc.)
  - low-pressure membranes for treating surface-water supplies
  - certain types of water-softening units
  - in-line, rapid-mix units
  - etc., etc. . . . etc. ( Tell us what you're interested in )

## **Initial Approach (continued)**

2. contact the reliable manufacturers of these technologies,

3. request a list of where these technologies are currently in operation,

4. collect sufficient full-scale data from these operating systems,

## **Initial Approach (continued)**

### 5. Determine:

- which operating parameter(s) should be used,
- how much operating data is necessary,
- what timeframe of data should be collected,
- frequency of the full-scale collected data,
- how this data should be statistically analyzed,
- format in which results should be reported,
- etc.

## **Initial Approach (continued)**

 develop "Draft" design criteria for each emerging technology for discussion among Ohio EPA, Ohio AWWA, and the OSU

### and

 work effectively with Ohio EPA to agree on "Final" design criteria to be used by the Agency in its plan approval process.

### **Items that were Discussed Today**

 Two Major Documents Developed by the Ohio AWWA Technology Committee

 Why the Technology Committee Develops Guidelines / Checklists

 Guidelines / Checklists that have Been Developed

## **Other Items that were Discussed**

 Guidelines / Checklists that have Recently Been Developed

 Guidelines that have been Revised by the Guidelines Review SubCommittee

Future Technology Committee Endeavors

## Next Processes / Rules to Be Discussed? Likely based on Survey Monkey Results

- Advanced-oxidation Processes
- Treatment processes Ohio Section AWWA members are interested in ..... LET US KNOW
- Etc.

Ohio Section AWWA Technology Committee -Emerging Technologies



1. Please complete this survey by identifying the top five treatment technologies you teel appropriate for further review (5 being highest rated / reast important to be reviewed). Following completion of the survey, a subcommittee will be assembled to review the prioritized list of treatment technologies. The subcommittee will further research these technologies and will develop recommendations for Agency approval criteria.

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