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# Three Strikes and You're Chlorinating

Steps for water systems with residual disinfection requirements

*DWS Spring Training  
May 10, 2022*



DRINKING WATER SERVICES  
Public Health Division

# Overview

- Regulatory background
- Notification and correction timeline
- Plan review process
- Monitoring and reporting
- Other considerations



Chlorination equipment

# Regulatory background

- *E. coli* MCL
- Total coliforms
  - Not considered harmful to humans
  - Useful indicator of other pathogens
- Coliform results show WSs may be vulnerable to contamination
- WSs investigate cause of coliforms
- Takes a “find and fix” approach

Combinations resulting in <i>E. coli</i> MCL	
Routine	Repeat
EC+	TC+
EC+	Any missing sample
EC+	EC+
TC+	EC+
TC+	TC+ (with no <i>E. coli</i> analysis)
<i>E. coli</i> positive (EC+), Total coliform positive (TC+)	

See October 2015 Pipeline Newsletter for RTRC

<https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/OPERATIONS/Documents/pipeline/pipeline-2015-10.pdf>

# What triggers a coliform investigation?

## Level 1

- Two or more TC+ in month (collects < 40 samples/month)
- > 5.0 % TC+ in month (collects > 40 samples/month)
- Fails to collect every required repeat sample after TC+

## Level 2

- WS incurs an *E. coli* MCL
- WS has 2<sup>nd</sup> level 1 investigation within 12-months

\* Coliform positive includes both routine and repeat samples

OAR 333-061-0078

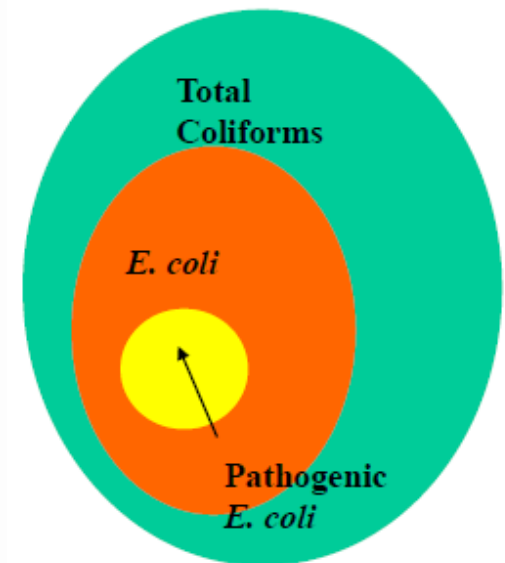
See Coliform Investigation Procedure

<https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/PARTNERS/Documents/gwr/coliform-Investigation-procedure.pdf>

# Why must WSs install residual disinfection?

- Repeated coliform detections / investigations
- A pathway for contamination exists in distribution system
- WS could be more susceptible to *E. coli*
- Find & fix approach does not resolve the coliform issue

Oregon made residual disinfection a requirement.



# What triggers residual disinfection requirement?

At water systems where:

- Three or more coliform investigations are triggered within a rolling 12-month period
- Four or more coliform investigations are triggered within a rolling 2-year period
- WSS must install and utilize treatment for disinfectant residual maintenance within 6 months
- Residuals must be monitored

# What triggers residual disinfection requirement?

Good to note:

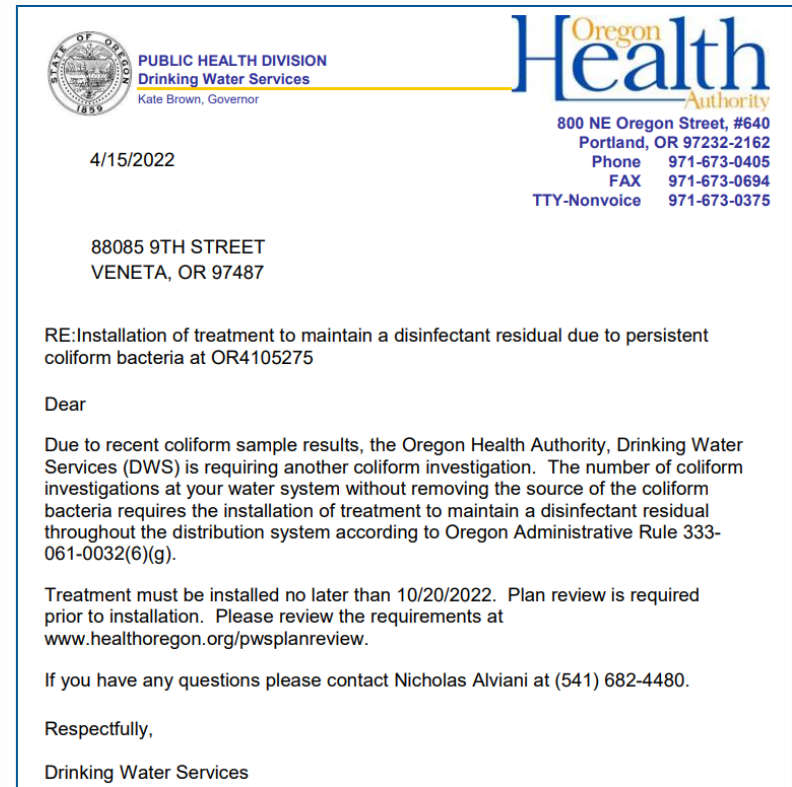
- Residual disinfection requirement may be suspended if
  - a sanitary defect reasonably believed to be source of contamination is corrected after requirement to utilize treatment is triggered, or
  - If regulator approves a schedule to correct the defect.
- Regulator may immediately re-establish requirement if one or more coliform investigations are triggered following correction of sanitary defect

# How is system notified of residual disinfection requirement?

DMCE will


- Email regulator that WS triggered residual disinfection
- Automatically generate letter to inform system of 6-month due date
- Creates compliance schedule in Data Online


Note: DMCE will also email regulator 2 weeks before installation due date as reminder.





# Data Online compliance schedule

 Oregon Public Health  
**Drinking Water Data Online**

 Oregon  
**Health**  
Authority

[Introduction](#) :: [Data Search Options](#) :: [Water System Search](#) :: [DWS Home](#) :: [DWS Rules](#) :: [Quick Data Links](#)

**PWS ID: [05275](#) -**

**Compliance and Enforcement Schedules**

Schedule Type  

All Schedules

Schedule Status  
☒ Open  
☒ Closed

Show Schedules

Type of Action	Date Issued	Due Date	Closed Date
<a href="#">Coliform Investigation</a>	Apr 15, 2022		Open
COMPLETE LEVEL 2 INVESTIGATION		May 28, 2022	
INSTALL DISINFECTANT RESIDUAL MAINT		Oct 20, 2022	
<a href="#">Coliform Investigation</a>	Mar 18, 2022		Mar 31, 2022
COMPLETE LEVEL 2 INVESTIGATION		Apr 24, 2022	Mar 31, 2022
<a href="#">Coliform Investigation</a>	Jul 12, 2021		Jul 13, 2021
LEVEL 1 INVESTIGATION - NO REPEATS		Aug 13, 2021	Jul 13, 2021

# What is regulator's role?

- Check-in with WS to ensure letter and due date are understood
  - Suggest writing contact report to document
- Point WS to plan review resources on DWS website
- Offer circuit rider information if technical assistance is needed
- Make WS aware of additional monitoring and reporting once residual disinfection is approved for use

## Circuit Rider Program

Drinking Water Services

Water System Operations

Surface Water Treatment

Capacity Development

Public Notice Resources & Templates

Fact Sheets & Best Management Practices

Water System Surveys & Outstanding Performance

Circuit Rider Program

### Background

Through Oregon's Drinking Water State Revolving Fund (DWSRF) and state general fund, contracts have been established with drinking water Circuit Riders to provide on-site technical services for community water systems serving populations under 10,000, as well as **nonprofit** transient and non-transient water systems and Oregon Very Small systems. For these water systems, services are free.

### Types of Services and Assistance

These services are designed to address short-term operational problems and are limited to 10 hours per issue (unless otherwise approved by Drinking Water Services management staff). Types of services and assistance include (but are not limited to) the following:

- Jar testing assistance
- Coagulant dosage optimization
- Corrosion control implementation
- Chemical feed math instruction
- Turbidimeter calibration
- Pump sizing
- Cross-connection assistance
- Sampling plan assistance
- Storage/distribution problems

# Plan review resources on DWS website

- Disinfection Instruction Packet
- Fees based on WS type and connections
- Instructions detail what to submit for review
- WS should contact plan review coordinator with questions

## Plan Review

### Drinking Water Services

#### Plan Review

#### Plan Review Exemption

#### Contact Us




## Plan Review Resources

### On this page:

- Payment and Submittal
- Land Use Statement
- Plan Review Exemption
- Project Final Approval Request Form
- Waiver from Construction Standards
- UV, Membrane, & Cartridge/Bag - Verified Models
- Instruction Packets and Fee Table

## Instruction Packets and Fee Table

The [PDF](#) Water System Plan Review Requirements is a document generic to all plan reviews. To provide focused assistance, especially for submitters having little or no experience with the plan review process Drinking Water Services is developing "information packages." These packages are provided below:

disinfection	 	 Export ▾	
Plan	CWS ≥ 300* Connections	CWS < 300 Connections & NCWS*	Instructions
Disinfection	\$825.00	\$248.00	<a href="#">Short Version</a> <a href="#">Long Version</a>

\*Number of connections is based on water system size not on how many connections are served by the

\*\* Examples include: arsenic or nitrate removal, disinfectant residual maintenance, coagulant injection.

\*\*\* Projects submitted jointly will be issued joint conditional and final approvals.

<https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/PLANREVIEW/Pages/index.aspx>

# Disinfection Instruction Packet

- Short and long instructions to guide WS through PR process
- Describes specific requirements
- Before construction
- After construction

Document Revision Date: 9/17/2019

## **Oregon Health Authority, Drinking Water Services**

### **Plan Review requirements for new disinfectant systems at existing public water systems.**

The requirements apply to new **disinfectant systems** for existing Community, Non-Transient Non-Community, Transient Non-Community, and Non-Public (aka State Regulated) water systems which are defined on page 7. Two sets of information are provided below, 'short' and 'long' instructions. The short instructions are abbreviated. If you are unfamiliar with the plan review process, it is strongly recommended you read the long instructions.

For assistance, call (971) 673-0405 or fax (971) 673-0694.

#### **SHORT INSTRUCTIONS:**

The following shall be submitted and approved by OHA **prior to construction** of a new **disinfectant system** or major additions or modifications to **existing disinfectant** systems:

1. Plans prepared by an Oregon Professional Engineer.
2. CT calculations (if necessary; required for all systems using a surface water source, and groundwater systems with a source having fecal contamination [e.g., *E. coli* confirmed]).
3. The appropriate plan review fee <http://healthoregon.org/pwsplanreview>.

#### Specific Requirements

##### **A. Prior to construction, submit at a minimum:**

1. A site plan showing the project location in relation to source, any existing treatment, proposed treatment, storage, and first customer served by the disinfectant system;
2. Narrative describing purpose of disinfectant and type of disinfectant;
3. Proof of proposed disinfectant's NSF Standard 60 certification;
4. Construction specifications indicating wetted materials have NSF Standard 61 certification;
5. CT calculations (if necessary depending on the purpose of disinfectant);
6. Disinfection Benchmark Profiling (if necessary depending on the type of disinfectant change); and
7. Plan Review fee.

##### **B. After construction, submit the following:**

1. Structural detail if different from the submitted plans (aka as-built detail); and
2. Documentation that all conditions outlined in the Conditional Approval letter were met.

#### **END SHORT INSTRUCTIONS**

# What will WS need for residual disinfection?

- Type of disinfectant (hypochlorite most common)
- Feed system
- Low level alarm on solution tank
  - Daily visual checks may be okay
- Disinfectant is added proportional to flow
- Sampling tap for both raw and treated water
  - Small systems can use treated tap at first user
- NSF certified equipment and chemicals
- DPD test kit to reliably check residual (digital preferred)

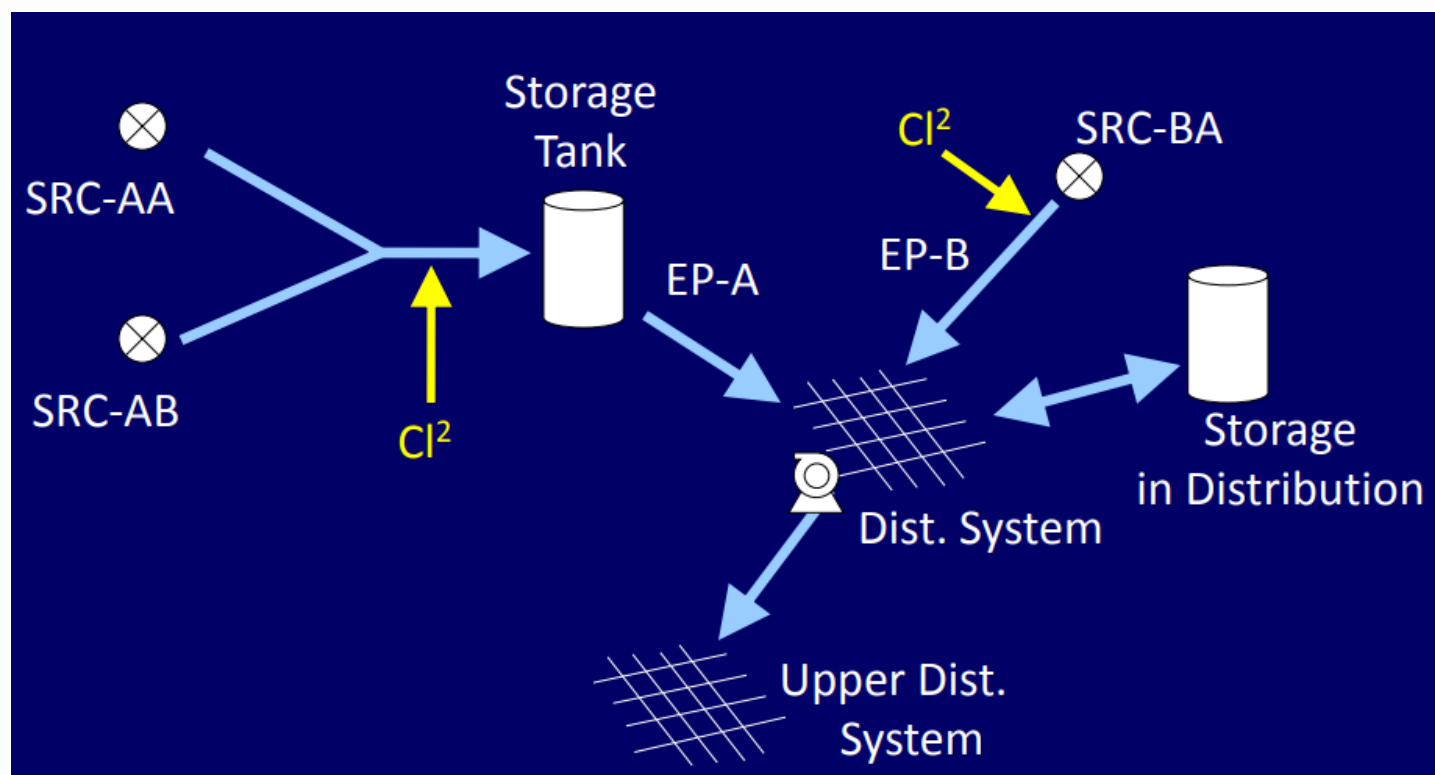


Additional plan review requirements may apply



# Where to apply residual disinfection?

- Simple WS: One source, one entry point
- More complex: Multiple sources, multiple entry points



# What monitoring and reporting is needed?

Once residual disinfection is installed and approved for use.

System will need to collect:

- Source assessment sample yearly at each active source
- Identify sites for ongoing DBP monitoring
- Collect 2 6-month rounds lead and copper at standard sites
- Measure and report residual with coliform samples
- Measure and record residual twice or more weekly in distribution system (records kept on site)

Suggest WS target a noticeable residual (0.2 mg/L or greater)  
that is measurable throughout distribution system.

# Disinfection byproducts (DBP) monitoring

- Chlorine can react with organic materials in water to form DBPs
- Applies to Community and NTNC WSs that add a primary or residual disinfectant other than UV
- Existing WSs that begin adding disinfectant must do standard monitoring (SM) for an initial distribution system evaluation (IDSE)
- IDSE sampling determines where future DBP monitoring will occur
- Focus is on high TTHMs and HAA5s
- SM plan and Final Report templates available on DWS website

OAR 333-061-0036(4)

<https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/RULES/STAGE2/Pages/index.aspx>



# Disinfection by-products (DBP) monitoring

## Initial Distribution System Evaluation (IDSE)

### Drinking Water Services

### Rules and Implementation Guidance

### Oregon Very Small Systems

### Ground Water Rule

### Long Term 2 Enhanced Surface Water Treatment Rule (LT2)

The goal of the initial distribution system evaluation (IDSE) is to identify the sites in the distribution system where customers may be exposed to high levels of DBPs. These sites will then be used for Stage 2 compliance monitoring. NTNC water systems serving less than 10,000 population are exempted from IDSE requirements but will be required to do Stage 2 compliance monitoring.

Systems had a choice of four IDSE options when the rule was originally implemented:

- Standard Monitoring: Monitoring takes place over one year.
- Systems Specific Study: Uses existing monitoring data or hydraulic modeling.
- 40/30 Certification: Uses existing data if all results are < 1/2 the MCL. *(Note: not available to newly chlorinating or new systems that chlorinate)*
- Very Small System Waiver: Available to water systems with less than 500 population. *(Note: not available to newly chlorinating or new systems that chlorinate)*




### Stage 2 Disinfection Byproducts Rule

### Compliance Monitoring Plans

### Compliance Determination & MCL Violations

### Initial Distribution System Evaluation (IDSE)

**New water systems that add a disinfectant other than UV and existing systems that begin adding a disinfectant must conduct Standard Monitoring or do a System Specific Study using hydraulic modeling in order to comply with the IDSE requirements.** Systems that were able to utilize either the 40/30 certification or very small system waiver when the rule was originally implemented were required to complete a Compliance Monitoring Plan (CMP) before compliance monitoring began, but otherwise had no other requirements under the IDSE portion of the rule.

- 
-  Standard Monitoring Plan IDSE template for water systems <10,000 population
  -  Standard Monitoring Final Report IDSE template water systems <10,000 population

# Purpose for IDSE Standard Monitoring Plan

- Determine number of distribution system monitoring locations
- Select and justify these locations
- Identify peak historical month (based on warmest water temp)
- Propose a monitoring schedule
- Include distribution system map to show sources, chlorination addition, and monitoring sites

Questions on filling out plan? Talk with your DWS technical services person.

# IDSE Standard Monitoring Plan

## IDSE Standard Monitoring Requirements

Source Water Type	Population Size Category <sup>1</sup>	Monitoring Periods and Frequency of Sampling	Distribution System Monitoring Locations <sup>2</sup>				
			Total per monitoring period	Near Entry Points	Average Residence Time	High TTHM Locations	High HAA5 Locations
Subpart H	<500 consecutive systems	one (during peak historical month) <sup>3</sup>	2	1	.....	1	.....
	<500 non-consecutive systems		2	.....	.....	1	1
	500-3,300 consecutive systems	four (every 90 days)	2	1	.....	1	.....
	500-3,300 non-consecutive systems		2	.....	.....	1	1
	3,301-9,999		4	.....	1	2	1
	10,000-49,999	six (every 60 days)	8	1	2	3	2
	50,000-249,999		16	3	4	5	4
Ground Water	<500 consecutive systems	one (during peak historical month) <sup>3</sup>	2	1	.....	1	.....
	<500 non-consecutive systems		2	.....	.....	1	1
	500-9,999	four (every 90 days)	2	.....	.....	1	1
	10,000-99,999		6	1	1	2	2

<sup>1</sup>Your monitoring requirements (locations and frequency) are based on the population served by your system.

<sup>2</sup>A dual sample set (i.e., a TTHM and an HAA5 sample) must be taken at each monitoring location during each monitoring period.

<sup>3</sup>The peak historical month is the month with the highest TTHM or HAA5 levels or the warmest water temperature.

# IDSE Standard Monitoring Plan

Page 1 of 6

## I. GENERAL INFORMATION

### A. PWS Information\*

PWSID: 41 01096  
 PWS Name: \_\_\_\_\_  
 PWS Address: 64711 Wood Ave  
 City: Bend State: OR Zip: 97701  
 Population Served: 442

### B. Date Submitted\* \_\_\_\_\_

System Type: (X)	Source Water Type: (X)	Buying / Selling Relationships: (X)
<input checked="" type="checkbox"/> CWS	<input type="checkbox"/> Subpart H	<input type="checkbox"/> Consecutive System
<input type="checkbox"/> NTNCWS	<input checked="" type="checkbox"/> Ground	<input type="checkbox"/> Wholesale System
		<input checked="" type="checkbox"/> Neither

### C. PWS Operations

Residual Disinfectant Type: (X)  
☒ Chlorine ☐ Chloramines ☐ Other: \_\_\_\_\_  
 Number of Disinfected Sources:  
☐ Surface ☐ GWUDI ☒ 1 Ground ☐ Purchased

### D. Contact Person\*

Name: \_\_\_\_\_  
 Title: Certified Operator  
 Phone #: 541-408-7912 Fax #: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

## II. IDSE REQUIREMENTS\*

A. Number of Compliance	B. Schedule	C. Compliance Monitoring Frequency
<input type="checkbox"/> Near Entry Point	<input type="checkbox"/> Schedule 1	<input type="checkbox"/> During peak historical month (1 monitoring period)
<input type="checkbox"/> Avg Residence Time	<input type="checkbox"/> Schedule 2	<input checked="" type="checkbox"/> Every 90 days (4 monitoring periods)
<input checked="" type="checkbox"/> 1 Highest TTHM	<input type="checkbox"/> Schedule 3	<input type="checkbox"/> Every 60 days (6 monitoring periods)
<input checked="" type="checkbox"/> 1 Highest HAA5	<input checked="" type="checkbox"/> Schedule 4	
<input checked="" type="checkbox"/> 2 Total		

# IDSE Standard Monitoring Plan

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## IV. JUSTIFICATION OF STANDARD MONITORING SITES\*

Standard Monitoring Site ID (from map) <sup>1</sup>	Site Type	Justification
SS #1	<input type="checkbox"/> Near Entry Pt <input type="checkbox"/> Avg. Res. Time <input checked="" type="checkbox"/> High TTHM <input type="checkbox"/> High HAA5	Based on flow and residence time. Site is located at the end of distribution system to south
SS #3	<input type="checkbox"/> Near Entry Pt <input type="checkbox"/> Avg. Res. Time <input type="checkbox"/> High TTHM <input checked="" type="checkbox"/> High HAA5	Based on flow and residence time. Site is located at end of distribution system to north
	<input type="checkbox"/> Near Entry Pt <input type="checkbox"/> Avg. Res. Time <input type="checkbox"/> High TTHM <input type="checkbox"/> High HAA5	
	<input type="checkbox"/> Near Entry Pt <input type="checkbox"/> Avg. Res. Time <input type="checkbox"/> High TTHM <input type="checkbox"/> High HAA5	
	<input type="checkbox"/> Near Entry Pt <input type="checkbox"/> Avg. Res. Time <input type="checkbox"/> High TTHM <input type="checkbox"/> High HAA5	
	<input type="checkbox"/> Near Entry Pt <input type="checkbox"/> Avg. Res. Time <input type="checkbox"/> High TTHM <input type="checkbox"/> High HAA5	
	<input type="checkbox"/> Near Entry Pt <input type="checkbox"/> Avg. Res. Time <input type="checkbox"/> High TTHM <input type="checkbox"/> High HAA5	
	<input type="checkbox"/> Near Entry Pt <input type="checkbox"/> Avg. Res. Time <input type="checkbox"/> High TTHM <input type="checkbox"/> High HAA5	

<sup>1</sup> Verify that site IDs match IDs in Section IV and on your distribution system schematic (See Section VII of this form). Attach additional copies if you are required to select more than 8 standard monitoring locations or need more room.

# IDSE Standard Monitoring Plan

Page 4 of 6

## V. PEAK HISTORICAL MONTH AND PROPOSED STANDARD MONITORING SCHEDULE

A. Peak Historical Month\* September

B. If Multiple Sources, Source Used to Determine Peak Historical Month

(write "N/A" if only one source in your system)

C. Peak Historical Month Based On\* (check all that apply)

☐ High TTHM

☒ Warmest water temperature

☐ High HAA5

If you used other information to select your peak historical month, explain here

(attach additional sheets if needed)

D. Proposed Standard Monitoring Schedule\*

Standard Monitoring Site ID (from map) <sup>1</sup>	Projected Sampling Date (date or week) <sup>2</sup>				
	period 1	period 2	period 3	period 4	
SS #1	wk 3 9/2018	wk 3 12/2018	wk 3 3/2018	wk 3 6/2018	
SS #3	wk 3 9/2018	wk 3 12/2018	wk 3 3/2018	wk 3 6/2018	

<sup>1</sup> Verify that site IDs match IDs in Section IV and on your distribution system schematic (See Section VII of this form). Attach additional copies if you are required to select more than 8 standard monitoring locations.

<sup>2</sup> period = monitoring period. Complete for the number of periods from Section II.C. Can list exact date or week (e.g., week of 7/9/07)

# IDSE Standard Monitoring Report

- Documents TTHM and HAA5 data gathered
- Determines DBP monitoring location(s) most appropriate
- Establishes frequency to collect DBPs
- Include compliance calculation procedure if needed (LRAA)

Consult with DWS technical services on SM report outcome and future DBP monitoring.

Submit both the SM Plan and Final Report to DWS as record of completion. DBP monitoring schedules will need to be updated.

# IDSE Standard Monitoring Report

- Reviews data collected to justify and set future sampling locations and frequency.

IDSE Report for Standard Monitoring								Page 4 of 9
III. MONITORING RESULTS (Continued)*								
E. IDSE Standard Monitoring Results - HAA5								
Site ID <sup>1</sup>	Data Type	HAA5 (mg/L)						LRAA
SS #1 (IDSE-01)	Sample Date	9/17/2018	12/3/2018	3/19/2019	6/17/2019			
	Sample Result	0.001	0.0000	0.0000	0.0000			0.0003
SS #3 (IDSE-02)	Sample Date	9/17/2018	12/3/2018	3/19/2019	6/17/2019			
	Sample Result	0.0012	0.0000	0.0000	0.0000			0.0003

Site ID <sup>1</sup>	Data Type	TTHM (mg/L)						LRAA
SS #1 (IDSE-01)	Sample Date	9/17/2018	12/3/2018	3/19/2019	6/17/2019			
	Sample Result	0.0031	0.0046	0.0027	0.0000			0.0026
SS #3 (IDSE-02)	Sample Date	9/17/2018	12/3/2018	3/19/2019	6/17/2019			
	Sample Result	0.0037	0.0049	0.0015	0.0000			0.0025



# IDSE Standard Monitoring Report

- Reviews data collected to justify and set future sampling locations and frequency.

IDSE Report for Standard Monitoring		
IV. JUSTIFICATION OF STAGE 2 DBPR COMPLIANCE MONITORING SITES*		
Stage 2 Compliance Monitoring Site ID	Site Type	Justification
SS #1	<input checked="" type="checkbox"/> Highest TTHM	Highest TTHM result 1st qtr and nearly same as site #3 in 3rd & 4th qtr. This site will provide better representation
SS #3	<input checked="" type="checkbox"/> Highest HAA5	Highest HAA5 slightly above laboratory reporting limit (0.001 mg/L). Sample collected in September.

C. Proposed Stage 2 DBPR Compliance Monitoring Schedule*				
Stage 2 Compliance Monitoring Site ID	Projected Sampling Date (date or week) <sup>1</sup>			
	period 1	period 2	period 3	period 4
SS #1	3rd wk Sept 20	3rd wk Sept 21	3rd wk Sept 22	3rd wk Sept 23
SS #3	3rd wk Sept 20	3rd wk Sept 21	3rd wk Sept 22	3rd wk Sept 23

<sup>1</sup> period = monitoring period. Complete for the number of monitoring periods from Section II.C.

Attach additional copies of this sheet if you need more room.

# Selecting and justify IDSE monitoring locations

## Good sites for high TTHM include:

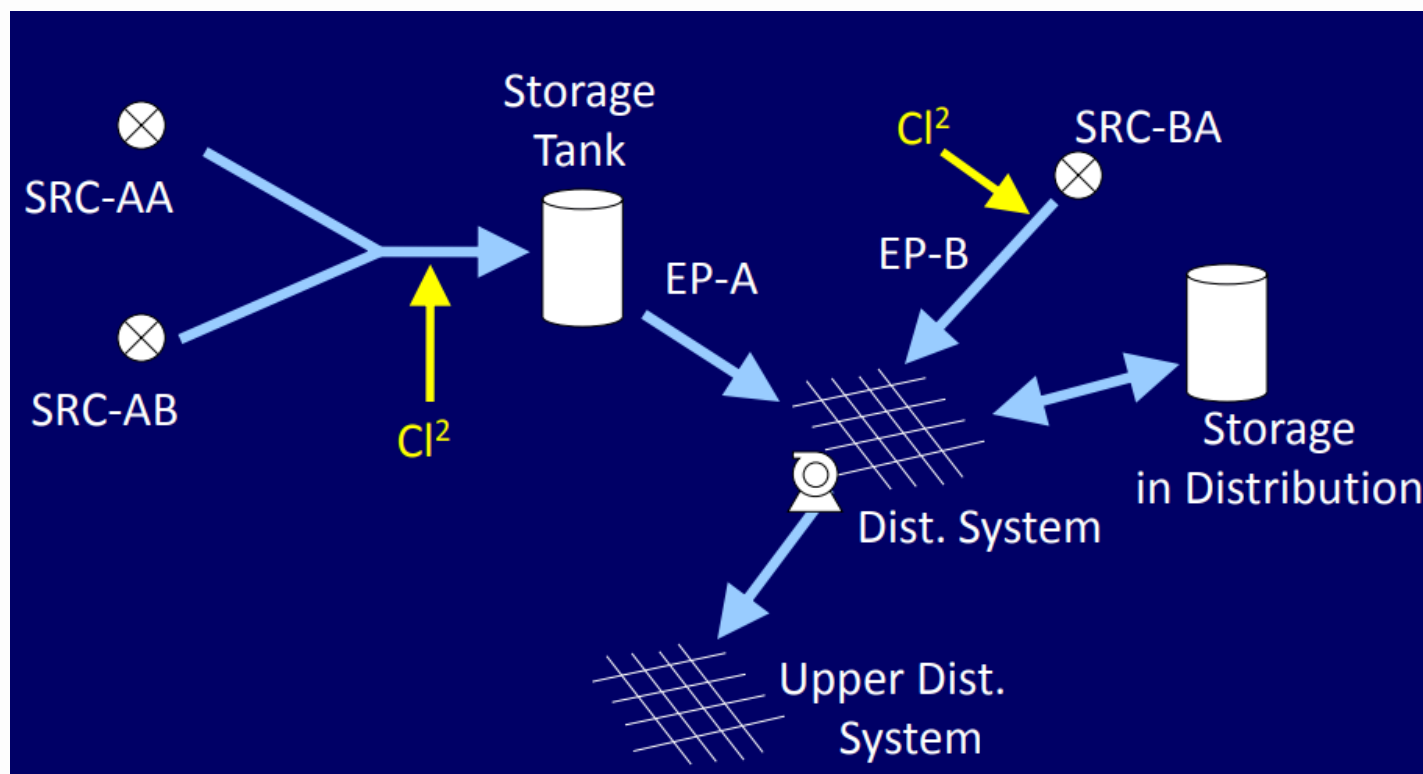
- Near the ends of the distribution system, at or before the last group of customers
- Areas with low flows or lightly developed areas
- Downstream of storage facilities
- Low or no residual

## Good sites for HAA5 include:

- In areas with low but detectable disinfectant residual
- Near the ends of the distribution system
- Areas where different sources combines within the distribution system
- Downstream of storage tanks
- Prior to the last fire hydrant

<https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/RULES/STAGE2/Pages/cmp.aspx#sites-nodata>

# Selecting and justify IDSE monitoring locations



# Lead and copper sampling

- Adding residual disinfection is long-term change
- Two 6-month rounds at standard monitoring sites
- WS may need to select additional sampling sites
- Provide copy of handout describing site selection criteria to identify sites with highest risk

Number of People Served by the Water System — Number of Standard Monitoring Sites	
>100,000	— 100
10,001 to 100,000	— 60
3,301 to 10,000	— 40
501 to 3,300	— 20
101 to 500	— 10
≤100	— 5
Number of People Served by the Water System — Number of Reduced Monitoring Sites	
>100,000	— 50
10,001 to 100,000	— 30
3,301 to 10,000	— 20
501 to 3,300	— 10
101 to 500	— 5
≤100	— 5

OAR 333-061-0036(10)(d)(D)(viii) & (10)(c)(B)

<https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/MONITORING/Pages/monitoring.aspx#pbcr>

# Lead and copper sampling

- Adding residual disinfection is long-term change
- Two 6-month rounds at standard monitoring sites
- WS may need to select additional sampling sites
- Provide copy of handout describing site selection criteria to identify sites with highest risk


Lead and Copper Sample Site Selection Criteria for Oregon	
Based on distribution system materials evaluation, community and NTNC water suppliers must identify a pool of lead and copper sampling sites large enough to ensure a sufficient number of sites are available for sampling. The sampling pool must target high risk sites using the criteria below (OAR 333-061-0036).	
<ul style="list-style-type: none"> <li>➤ Samples must be selected from <b>Tier 1</b> sites, unless</li> <li>➤ Insufficient Tier 1 sites are available, then <b>Tier 2</b> sites must be used, unless</li> <li>➤ Insufficient Tier 2 sites are available, then <b>Tier 3</b> sites must be used for community systems (and other representative sites for NTNCs).</li> <li>➤ If no Tier 1, 2, or 3 sites are available, the additional sampling sites must be representative of plumbing materials typically found throughout the water system.</li> </ul>	
Tier Structure	
Community Water Systems	Non-Transient Non-Community Systems
<b>TIER 1 SITES - Single family structures with:</b> <ul style="list-style-type: none"> <li>• Copper plumbing with lead solder installed between 1/1/1983 and 6/30/1985*</li> <li>• Lead pipes including goosenecks or pigtails**</li> <li>• Multiple family residences may be used as Tier 1 sites when they comprise at least 20% of the total service connections.</li> </ul>	<b>TIER 1 SITES - Buildings with:</b> <ul style="list-style-type: none"> <li>• Copper plumbing with lead solder installed between 1/1/1983 and 6/30/1985*</li> <li>• Lead pipes including goosenecks or pigtails**</li> </ul>
<b>TIER 2 SITES – Buildings</b> (apartment buildings, schools, hospitals) with: <ul style="list-style-type: none"> <li>• Copper plumbing with lead solder installed between 1/1/1983 and 6/30/1985*</li> <li>• Lead pipes including goosenecks or pigtails**</li> </ul>	<b>TIER 2 SITES - Buildings with:</b> <ul style="list-style-type: none"> <li>• Copper plumbing with lead solder installed before 1983</li> </ul>
<b>TIER 3 SITES - Single family structures with:</b> <ul style="list-style-type: none"> <li>• Copper plumbing with lead solder installed before 1983</li> </ul>	<b>OTHER SITES:</b> Sites representative of plumbing materials commonly found throughout the water supply
<b>OTHER SITES:</b> Sites representative of plumbing materials commonly found throughout the water supply	
<i>*The use of lead solder was banned in Oregon in construction of all homes and buildings connected to a public water system on 6/30/1985.</i>	
<i>**Goosenecks or pigtails are commonly defined as the publicly-owned portion of the service line between the water main and a connector line or the curb box.</i>	

OAR 333-061-0036(10)(d)(D)(viii) & (10)(c)(B)

<https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/MONITORING/Pages/monitoring.aspx#pbcr>

# Other considerations

- Update coliform sampling plan to include source assessment
- Add measuring residual to coliform sampling protocol
- Include chlorination equipment in WS operation, maintenance, and emergency/safety documentation.

 **Revised COLIFORM SAMPLING PLAN**  
For public water systems serving up to 1,000 persons

1. **System Name:** \_\_\_\_\_ **PWS ID #: 41**  
Contact Person: \_\_\_\_\_ Phone #: (     )     -  
Date:     /     /

2. Distribution System Sampling: Collect \_\_\_\_\_ routine sample(s) every Month / Quarter.  
(Add Number) (Circle One)

3. Source Water Assessment Sampling Required? Yes / No every Month / Year.  
(Circle One) (Circle One)

3. Sampling Sites and Collection Rotation Schedule (Include additional sites if necessary):

Distribution Routine Sites (Address/Locations)	Distribution Repeat & Source Sampling	Distribution Repeat & Source Sites (Address/Locations)
Routine Site 1	Repeat Site 1A	Same as Routine Site 1
	Repeat Site 1B	
	Repeat Site 1C	
	Triggered Source*	

# Final comments...

- Residual disinfection can be a big change for small WSs
- Follow up on additional monitoring and reporting questions for a smooth transition
- Once IDSE and LCR standard and routine monitoring is complete, reevaluate for reduced monitoring eligibility
- Consult with your DWS technical services person if you have any questions!

# Questions, comments...

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