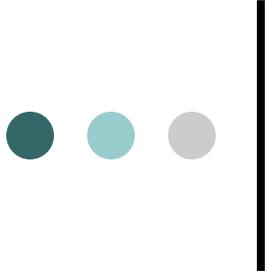




***Stage 2 Disinfectants and  
Disinfection By-products  
Rule Overview***

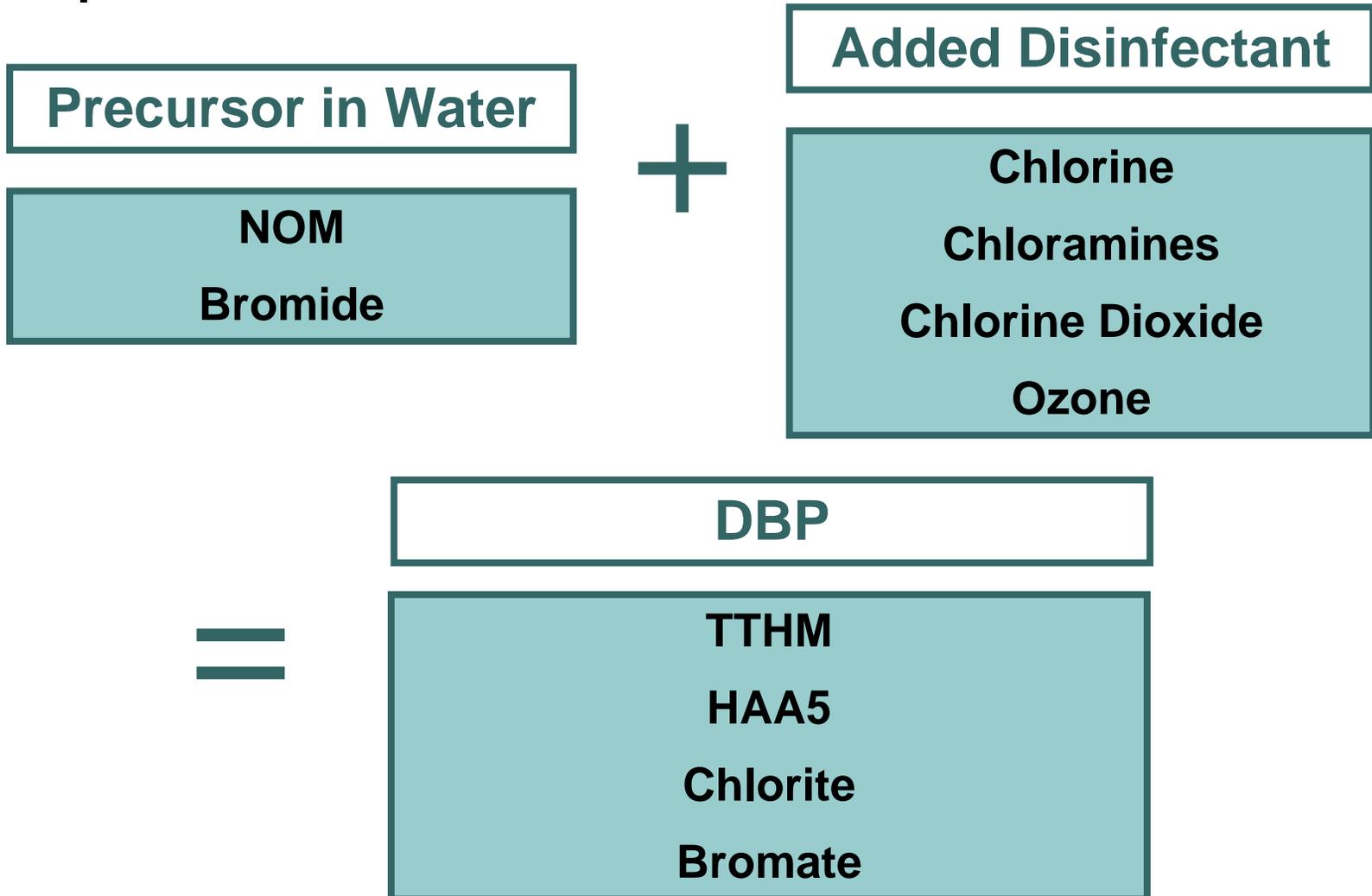


# Disinfectant and Disinfection By-products

- Disinfectants:
  - Benefits
    - Kill disease-causing microorganisms
  - React to form harmful byproducts
  - In large doses
    - Eye and nose irritation
    - Stomach discomfort
    - Anemia
    - Other acute short-term health effects
- Disinfection By-product Health Effects:
  - Cancer
  - Liver problems
  - Kidney problems
  - Central nervous system problems
  - Anemia
  - Reproductive problems



# How Are DBPs Formed?



# Factors Affecting DBP Formation

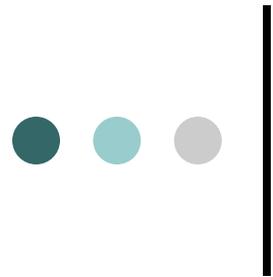
- Precursor concentration
- Disinfectant - type and dose
- Water chemistry
- Water temperature
- Residence time
- Biodegradation of HAAs





# Stage 2 DBPR Overview

- IDSE (Initial Distribution System Evaluation)
  - Very Small System Waiver (VSS)
  - 40/30 Certification (40/30)
  - Standard Monitoring
  - System Specific Study
- Stage 2 Compliance Monitoring
  - New sites - chosen from IDSE and Stage 1 DBPR sites
  - Locational Running Annual Average (LRAA)
  - Operational Evaluations
- Additional Issues
  - Population-based monitoring
  - Consecutive systems
  - Reduced monitoring revisions

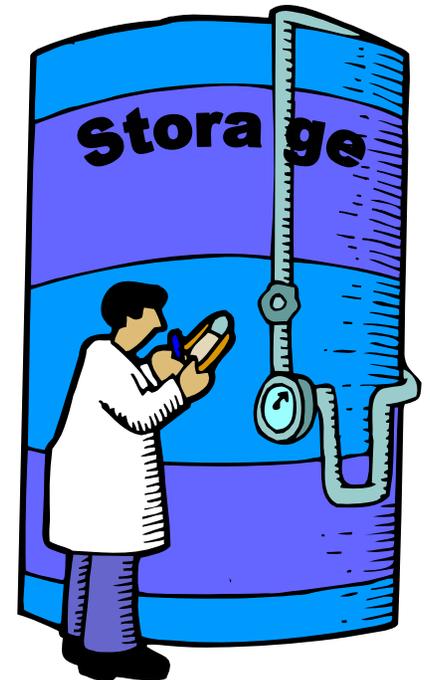


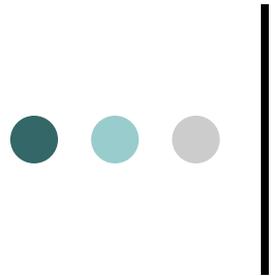
# Consecutive Systems

- Stage 1
  - Some states did not require systems to monitor
  - Consumers do not receive the same level of protection
    - Often oldest water in system
- Stage 2
  - Extends protection to consecutive systems
    - IDSE requirements
    - TTHM and HAA5 monitoring
    - Chlorine and chloramine MRDL of 4.0 mg/l
      - April 1, 2009

# Challenges for Consecutive Systems

- No control of treatment process
- Most BATs focus on precursor removal
- BATs for consecutive systems
  - Switch to chloramination
    - $\geq 10,000$  only
  - Manage residence time
- May not have data for VSS Waiver or 40/30 Certification





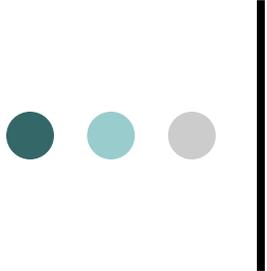
# Requirements and Deadlines

## ○ Stage 1

- What you had to do was based on
  - your source water type
  - your population served
  - your number of treatment plants/wells
- When you had to do it was based on
  - your source water type
  - your population served

## ○ Stage 2

- What you have to do is based on
  - your source water type
  - your population served
- When you have to do it is based on
  - your source water type
  - **population of the largest system in combined distribution system (CDS)**



# Combined Distribution Systems (CDSs)

- All systems in a CDS on the same schedule
  - Compliance date is based on the population of the largest system in the CDS
  - Largest system is not necessarily the wholesaler
- Discretion with emergency or seasonal connections



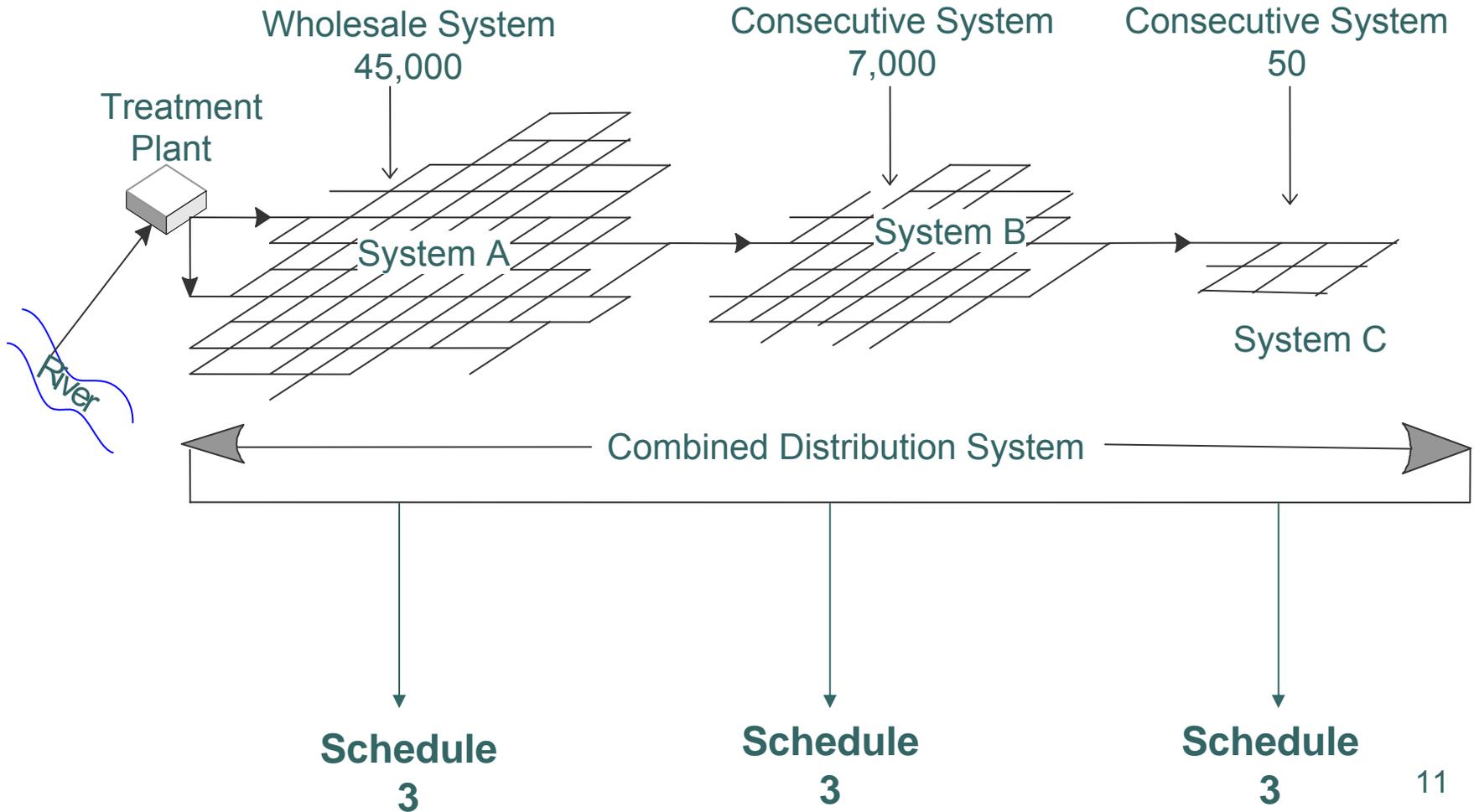
# Schedules

<i>System Category</i>	<i>Schedule</i>
Population $\geq 100,000$ OR part of a CDS with largest system* $\geq 100,000$	1
Population 50,000 to 99,999 people OR part of a CDS with largest system* 50,000 to 99,999	2
Population 10,000 to 49,999 people OR part of a CDS with largest system* 10,000 to 49,999	3
Population $< 10,000$ OR part of a CDS with largest system* $<10,000$	4

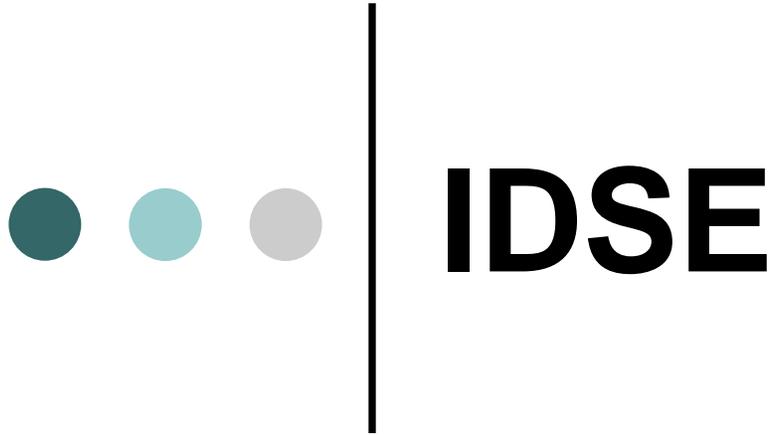
\* Population of largest system, not sum of all connected populations.



# Combined Distribution Systems



<b>S C H E D U L E</b>	<b><i>Population (largest system in CDS)</i></b>	<b><i>Submit 40/30 Certification, SM Plan, or SSS Plan</i></b>	<b><i>Complete SM or SSS</i></b>	<b><i>Submit IDSE Report for SM or SSS</i></b>	<b><i>Begin Stage 2 Compliance Monitoring (submit CM plan)</i></b>
<b>1</b>	<b><i>&gt;=100,000</i></b>	<b><i>October 1 2006</i></b>	<b><i>September 30 2008</i></b>	<b><i>January 1 2009</i></b>	<b><i>April 1 2012</i></b>
<b>2</b>	<b><i>50,000- 99,999</i></b>	<b><i>April 1 2007</i></b>	<b><i>March 31 2009</i></b>	<b><i>July 1 2009</i></b>	<b><i>October 1 2012</i></b>
<b>3</b>	<b><i>10,000- 49,999</i></b>	<b><i>October 1 2007</i></b>	<b><i>September 30 2009</i></b>	<b><i>January 1 2010</i></b>	<b><i>October 1 2013</i></b>
<b>4</b>	<b><i>&lt;10,000</i></b>	<b><i>April 1 2008</i></b>	<b><i>March 31 2010</i></b>	<b><i>July 1 2010</i></b>	<b><i>October 1 2013 or 2014</i></b>

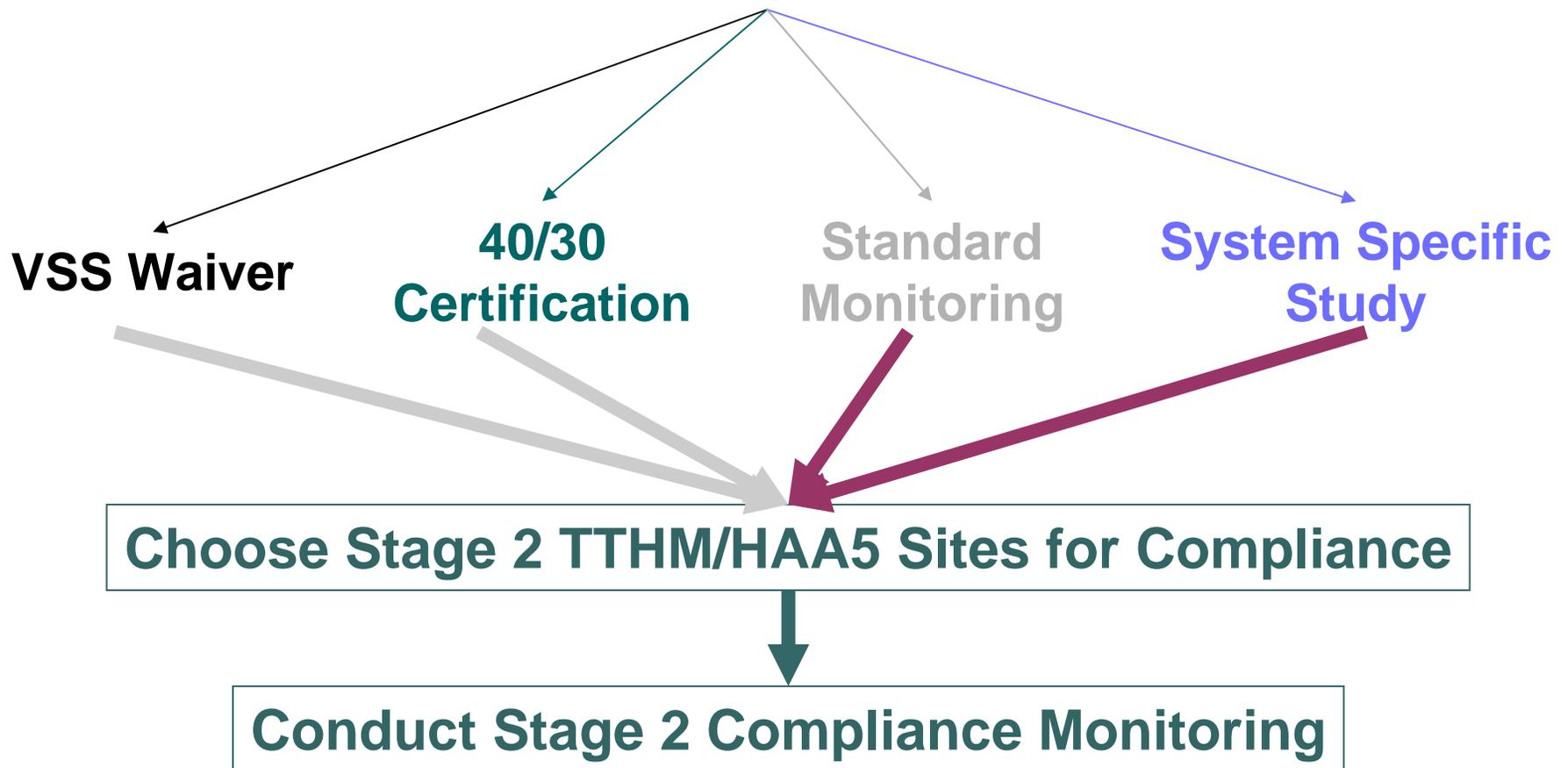


**IDSE**



# Stage 2 DBPR

## IDSE Options\*



\* IDSE required of all CWS and NTNCWS serving > 10,000 people

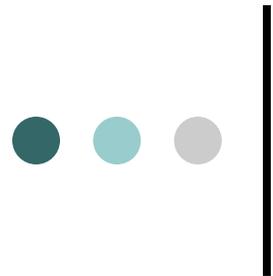


# IDSE Deadlines

<b>S C H E D U L E</b>	<b>Receive VSS Waiver, Submit 40/30 Certif., Submit SM Plan, or Submit SSS Plan</b>	<b>Systems conducting SM or SSS complete Evaluation</b>	<b>Systems conducting SM or SSS submit IDSE Report</b>
<b>1</b>	<b>Oct. 1, 2006</b>	<b>September 30, 2008</b>	<b>January 1, 2009</b>
<b>2</b>	<b>Apr. 1, 2007</b>	<b>March 31, 2009</b>	<b>July 1, 2009</b>
<b>3</b>	<b>Oct. 1, 2007</b>	<b>September 30, 2009</b>	<b>January 1, 2010</b>
<b>4</b>	<b>Apr. 1, 2008</b>	<b>March 31, 2010</b>	<b>July 1, 2010</b>



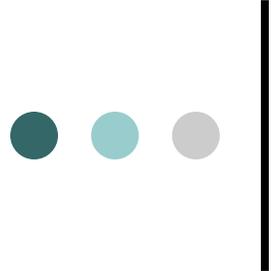
# **Very Small System (VSS) Waivers**



# Eligibility Criteria

- Systems must
  - Serve fewer than 500 people
  - Have taken TTHM and HAA5 data
    - Reduced monitoring acceptable
    - Operational data acceptable
      - Let EPA know you have it

**Note: Waiver may be denied,  
even if you meet eligibility criteria**

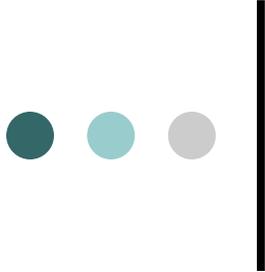


# VSS Waivers

- Waivers effective immediately
  - No application necessary
  - Unless you hear otherwise, assume you're OK
- Only a waiver from IDSE
  - Must conduct compliance monitoring
  - Continue compliance with Stage 1 DBPR until Stage 2 DBPR compliance begins



# 40/30 Certification



# Eligibility Criteria

- 2-year eligibility period
  - (eight consecutive quarters)
- No individual sample can have exceeded:
  - 0.040 mg/L for TTHM
  - 0.030 mg/L for HAA5
- No TTHM or HAA5 monitoring violations (must have taken all required Stage 1 samples)

**Note: Certification may be denied,  
even if system meets eligibility criteria**



# Eligibility Period and Deadline

Schedule	Eligibility Period Beginning No Earlier Than:	Submit 40/30 Certification By:
1	January 2004	October 1, 2006
2		April 1, 2007
3	January 2005	October 1, 2007
4		April 1, 2008

# ● ● ● | Operational Data

- EPA may allow systems to use operational data to qualify for certification
- Should be equivalent to Stage 1 data
  - Approved methods at a certified lab
  - Sample locations
  - Number of sample sites
  - Sampling frequency
  - Month of warmest water temperature





# Example 40/30 Certification Letter

## System Information

PWS Name \_\_\_\_\_ PWS ID: \_\_\_\_\_  
 Street Address: \_\_\_\_\_ City, State, Zip: \_\_\_\_\_  
 Population Served: \_\_\_\_\_ Source Water Type:  Ground  Subpart H  
 System Type:  CWS  NTNCWS  
 Combined Distribution System:  Wholesale  Consecutive  Neither

## Contact Person

Name: \_\_\_\_\_ Title: \_\_\_\_\_  
 Phone Number: \_\_\_\_\_ Fax Number (if available): \_\_\_\_\_  
 Email Address (if available): \_\_\_\_\_

## Certification

*I hereby certify that each individual Stage 1 DBPR compliance sample collected from \_\_\_\_\_ to \_\_\_\_\_ was less than or equal to 0.040 mg/L for TTHM and 0.030 mg/L for HAA5. I understand that to be eligible, each individual sample must be equal to or below these values. I also certify that this PWS collected all required Stage 1 samples and did not have any monitoring violations during this time period.*

Signature: \_\_\_\_\_ Date: \_\_\_\_\_



# Additional Information May Be Required

- Distribution system schematic
- Sampling data certification is based on
- Recommendations for Stage 2 compliance monitoring sites



# 40/30 Certification

- Only a waiver from IDSE
  - Continue compliance with Stage 1 DBPR until Stage 2 DBPR compliance begins
  - Must conduct compliance monitoring



# 40/30 Certification Submittal

- Hard copy mailed to:

Stage 2 DBPR

USEPA-IPMC

PO Box 98

Dayton, OH 45401-0098

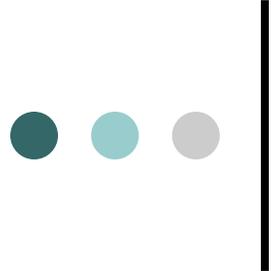
- Electronically

- IDSE Tool

- <http://www.epa.gov/safewater/disinfection/tools/tools-idse.html>

- E-mail to [stage2mdbp@epa.gov](mailto:stage2mdbp@epa.gov)





# Waiver Denial

- EPA may deny VSS Waiver or 40/30 Certification
- Considerations:
  - Inadequate data
    - Consecutive system not complying with Stage 1 (VSS)
    - Few plants but large population
    - Stage 1 sites not representative
  - Difficulty maintaining disinfectant residual
  - High DBP levels (VSS)
  - Systems with complicated distribution systems

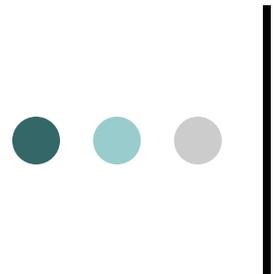


# **Standard Monitoring**



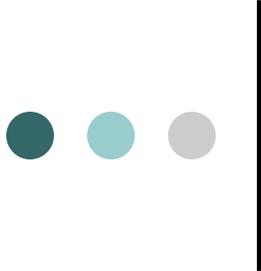
# Standard Monitoring Steps

Schedule	Submit Plan	EPA Review*	Complete Monitoring	Submit IDSE Report
1	10/1/2006	10/1/2007	9/30/2008	1/1/2009
2	4/1/2007	4/1/2008	3/31/2009	7/1/2009
3	10/1/2007	10/1/2008	9/30/2009	1/1/2010
4	4/1/2008	4/1/2009	3/31/2010	7/1/2010



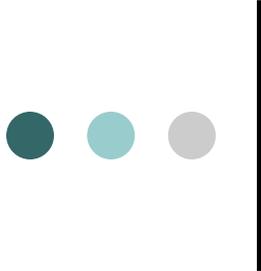
# Required Components of Standard Monitoring Plan

- Distribution system schematic
  - Entry points, sources, and storage facilities
  - Proposed Standard Monitoring sites
  - Stage 1 monitoring sites
- Source water type and population served
- Justification of site selection



# Standard Monitoring Requirements

- Monitoring Locations
  - High TTHM
  - High HAA5
  - Avg. Residence Time
  - Near Entry Points
- Number of sites
  - Based on source water type and population served
- Sampling
  - Dual sample set
  - Both TTHM and HAA5 collected at all locations
- Monitoring Frequency
  - 1, 4, or 6 sampling events during 1 year period
- Peak historic month



# Standard Monitoring for SW, GWUDI and Purchased SW

Population	Monitoring Periods	Total Sites	Near EP	ART	High TTHM	High HAA5
<500 consecutive	1	2	1	-	1	-
<500 non-consec.		2	-	-	1	1
500-3,300 consecutive	4	2	1	-	1	-
500-3,300 non-consec.		2	-	-	1	1
3,301-9,999		4	-	1	2	1
10,000-49,999	6	8	1	2	3	2
50,000- 249,999		16	3	4	5	4
250,000-999,999		24	4	6	8	6
1,000,000-4,999,999		32	6	8	10	8
≥ 5,000,000		40	8	10	12	10



# Standard Monitoring for GW and Purchased GW

Population	Monitoring Periods	Total Sites	Near EP	ART	High TTHM	High HAA5
< 500 consecutive	1	2	1	-	1	-
< 500 non-consecutive		2	-	-	1	1
500-9,999	4	2	-	-	1	1
10,000 – 99,999		6	1	1	2	2
100,000-499,999		8	1	1	3	3
≥ 500,000		12	2	2	4	4

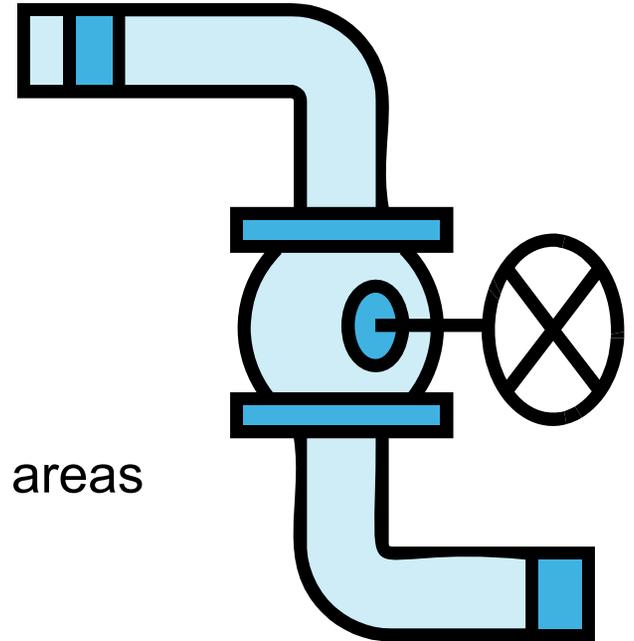
# Selecting Standard Monitoring Sites

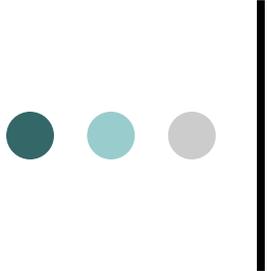
- Data sources and tools
  - Distribution system maps
  - Water quality data
  - Distribution system operating data
- Plan must include a justification for the selection of sampling sites



# Data Sources and Tools for Site Selection

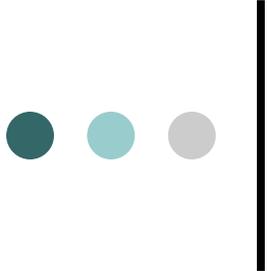
- Distribution system maps
  - Pipe
    - Dead ends
    - Length and diameter
    - Age and material
  - Water use
    - Highly and lightly developed areas
    - Major users
  - Entry points and sources
  - Key components
    - Tanks, pump stations, booster chlorination





# Data Sources and Tools for Site Selection

- Water quality data
  - Source water quality
    - Multiple sources
  - DBP data
    - Should use Stage 1 DBPR data for information
    - Cannot use Stage 1 DBPR sites for Standard Monitoring sites
  - Disinfectant residual data
    - Can be indicative of residence time, but...
      - Other factors can deplete residual
      - Booster chlorination will increase residual
  - Heterotrophic Plate Count (HPC)
    - May indicate biodegradation of HAA5
    - Sites with high HPC counts may not be a good HAA5 sites



# Data Sources and Tools for Site Selection

- Distribution system operating data
  - Understanding water flow
    - Pump run times
    - Metered flows between pressure zones
    - Billing records for major users
    - Advanced tools (hydraulic modeling or tracer studies)
  - Impact of tanks
    - Tank level records and tank configurations
  - Impact of booster chlorination
    - Typically located in areas of long residence time
    - Increasing disinfectant can increase DBP formation

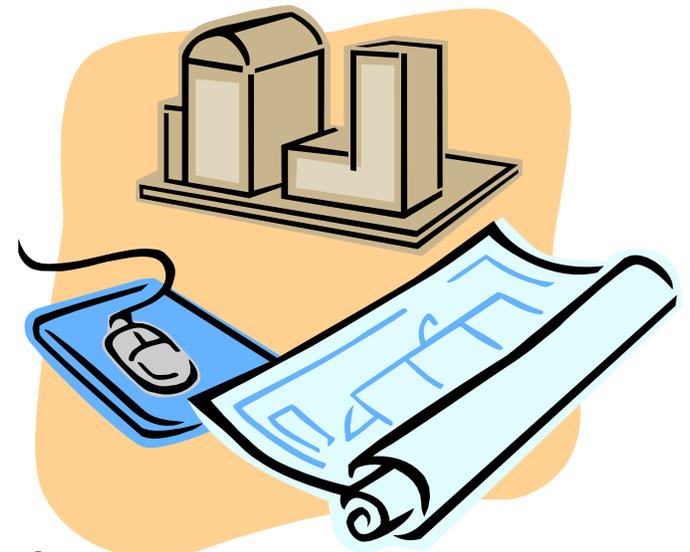


# Selecting Near Entry Point Sites

- Location
  - After treatment
  - Before first customer
- If more entry points than needed
  - Highest annual water flow
- If fewer entry points than needed
  - Replace with high TTHM and HAA5 sites
    - Alternate, starting with TTHM
  - Total number of sites must meet requirement

# Selecting Average Residence Time Sites

- Determination
  - Flow weighted analysis
  - Population weighted analysis
- Tools
  - Distribution system map
  - Distribution system operational data
    - Hydraulic modeling or tracer study
    - Pump run times, metered flow
  - Distribution system water quality data
    - Average disinfectant residual





# Selecting High TTHM Sites

- TTHM formation
  - Advanced residence time is primary factor
- Good TTHM sites
  - Downstream of tanks and booster chlorination
  - Hydraulic and geographic dead ends (prior to last customer)
  - Sites with difficulty maintaining residual
  - Areas with low water use
  - Areas of high historic levels
- Avoid
  - Dead ends with no users
  - Sites after the last hydrant or blowoff
  - Sites upstream of booster chlorination

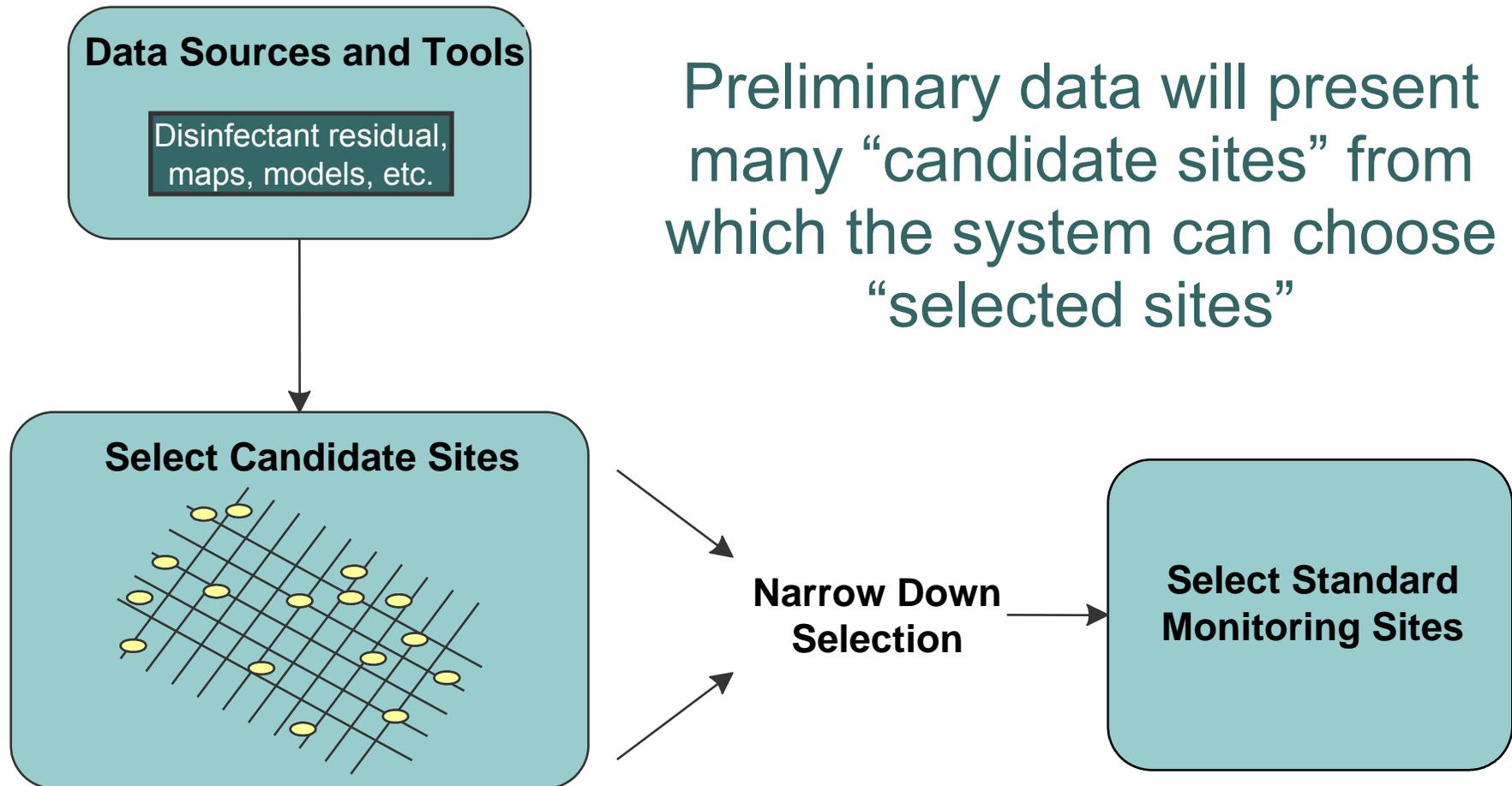


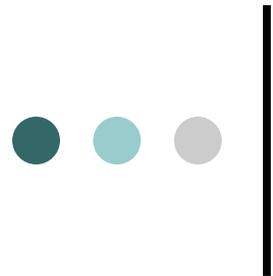


# Selecting High HAA5 Sites

- HAA5 formation
  - Residence time, but also consider biodegradation
- Good HAA5 sites
  - Downstream of booster chlorination
  - Sites with low but detectable residual
  - Areas of high historic levels
  - Others with high residence time
- Avoid
  - Areas with known biofilm growth
  - Areas with difficulty maintaining a residual

# Standard Monitoring Site Selection





## Final “Selected” Sites

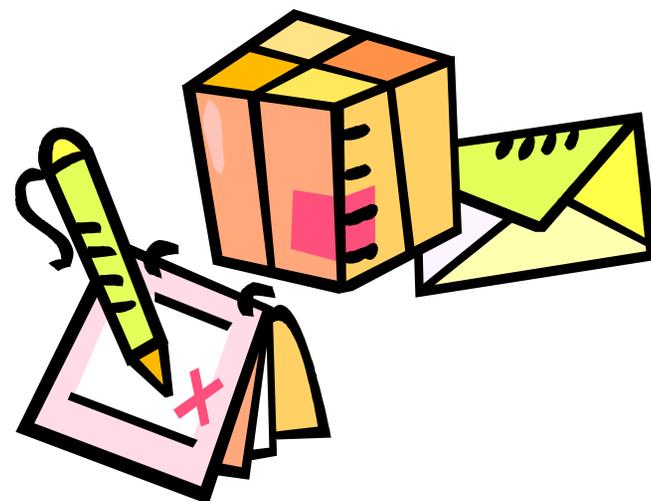
- Some site selection will be obvious
  - Near entry point
- Others will require professional judgment
  - Geographic representation
  - Hydraulic representation
  - Sources with higher precursors
  - Use sites that “multi-task”
  - Consider accessibility

# Submit Standard Monitoring Plan

- Hard copy mailed to:
  - Stage 2 DBPR
  - USEPA-IPMC
  - PO Box 98
  - Dayton, OH 45401-0098

- Electronically

- IDSE Tool
  - <http://www.epa.gov/safewater/disinfection/tools/tools-idse.html>
- E-mail to [stage2mdbp@epa.gov](mailto:stage2mdbp@epa.gov)

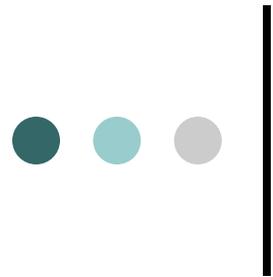




# Conduct Evaluation

- Monitor in accordance with approved plan
  - One year of monitoring
  - IDSE monitoring is not compliance monitoring
    - Cannot cause an exceedance
- Continue with Stage 1 through standard monitoring period

**If you do not hear from EPA within 12 months from the date when the plan was due, you can consider the plan approved.**



# IDSE Report

- Identify Stage 2 Compliance Monitoring Sites
- Deadline
  - 3 months from deadline for completing monitoring
- Rule sets protocol for choosing sites
  - Calculate average value for TTHM and HAA5 for each site
  - IDSE and Stage 1 sites

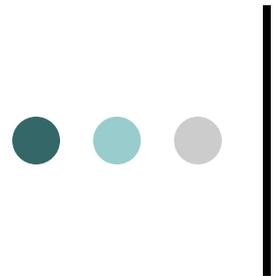


# Site Selection Protocol

1. Highest TTHM
2. Highest HAA5
3. Next Highest HAA5 from Stage 1
4. Next Highest TTHM
5. Next Highest TTHM
6. Next Highest HAA5
7. Next Highest TTHM from Stage 1
8. Next Highest HAA5



# **System Specific Study**



# System Specific Study

- Existing Monitoring Results
  - Based on data already available to system
  - Similar to Standard Monitoring
  - Combination of Stage 1 and other operational data
    - Systems with many treatment plant and small population
- Modeling
  - Based on hydraulic model
- Steps Similar to Standard Monitoring
  - Submit study plan, conduct study, submit IDSE Report
  - Can do all together if you're ready



# **System Recordkeeping**



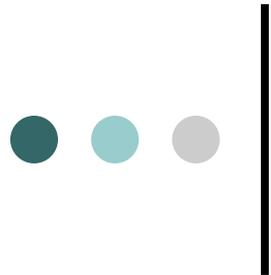
# IDSE Recordkeeping

- VSS
  - No records to keep
- 40/30
  - Keep certification for 10 years from date of submittal
- Standard Monitoring and SSS
  - Keep plan for 10 years from date of submittal
  - Keep report for 10 years from date of submittal
  - CCR must include range of IDSE monitoring results from that calendar year
- Make all available for review by EPA, state or the public





# **Stage 2 Compliance Monitoring**



# Stage 2 Compliance Monitoring

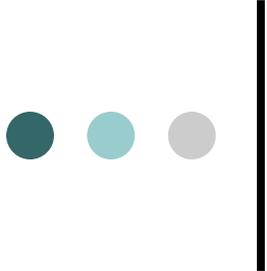
- Start monitoring at Stage 2 sites
- Phase out Stage 1 (sites not selected)

Schedule	Conduct Stage 2 CM
1	April 1, 2012
2	October 1, 2012
3	October 1, 2013
4	October 1, 2013 If Crypto monitoring not required under LT2
4	October 1, 2014 If Crypto monitoring is required under LT2

## Stage 2 DPBR Routine Compliance Monitoring Frequency and Number of Sites

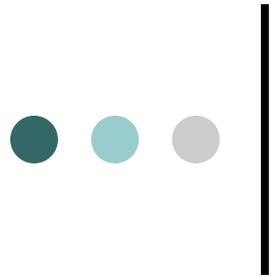
Source	Population	Frequency	Sites
Surface GWUDI Purchased Surface	<500	Annual	2
	500-3,300	Quarterly	2
	3,301-9,999		2 *
	10,000-49,999		4 *
	50,000-249,999		8 *
	250,000-999,999		12 *
	1,000,000-4,999,999		16 *
	≥ 5,000,000		20 *
Ground Purchased Ground	<500	Annual	2
	500-9,999	Annual	2
	10,000-99,999	Quarterly	4 *
	100,000-499,999		8 *
	≥ 5,000,000		20 *

\*Dual Samples Taken at Each Site



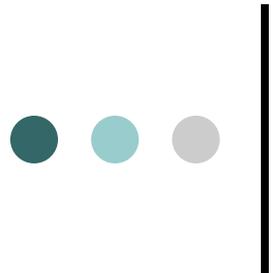
# Compliance Monitoring Plan

- VSS and 40/30 systems and NTNC <10,000
  - Did not conduct IDSE
    - No IDSE report
  - Must prepare a Stage 2 Monitoring plan
    - Before required to start monitoring
- Standard Monitoring or SSS systems
  - Not necessary **if** all the required elements of a compliance monitoring plan included in IDSE report
    - Compliance calculations procedures



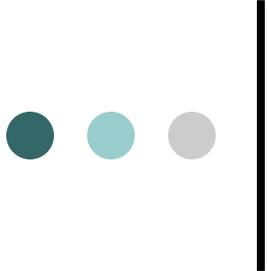
# Compliance Monitoring Plan

- VSS Systems
  - Only need two individual or one dual sample site
    - Choose a location for high TTHM
    - Choose a location for high HAA5
    - May be same location
- 40/30 and NTNC Systems
  - Select Stage 2 sites
    - Fewer Stage 2 sites than Stage 1
      - Select from Stage 1
    - More Stage 2 sites than Stage 1
      - Use system information to find additional sites



# Stage 2 DBPR Compliance Monitoring

- New Locations
  - Sampling based on source water type and population served (not number of plants)
  - From IDSE and Stage 1
- Compliance Calculation
  - Locational Running Annual Average (LRAA)
- Operational Evaluations
  - $Q_1 + Q_2 + (2Q_3) > MCL$
  - Conduct Evaluation
    - Avoid Exceedance



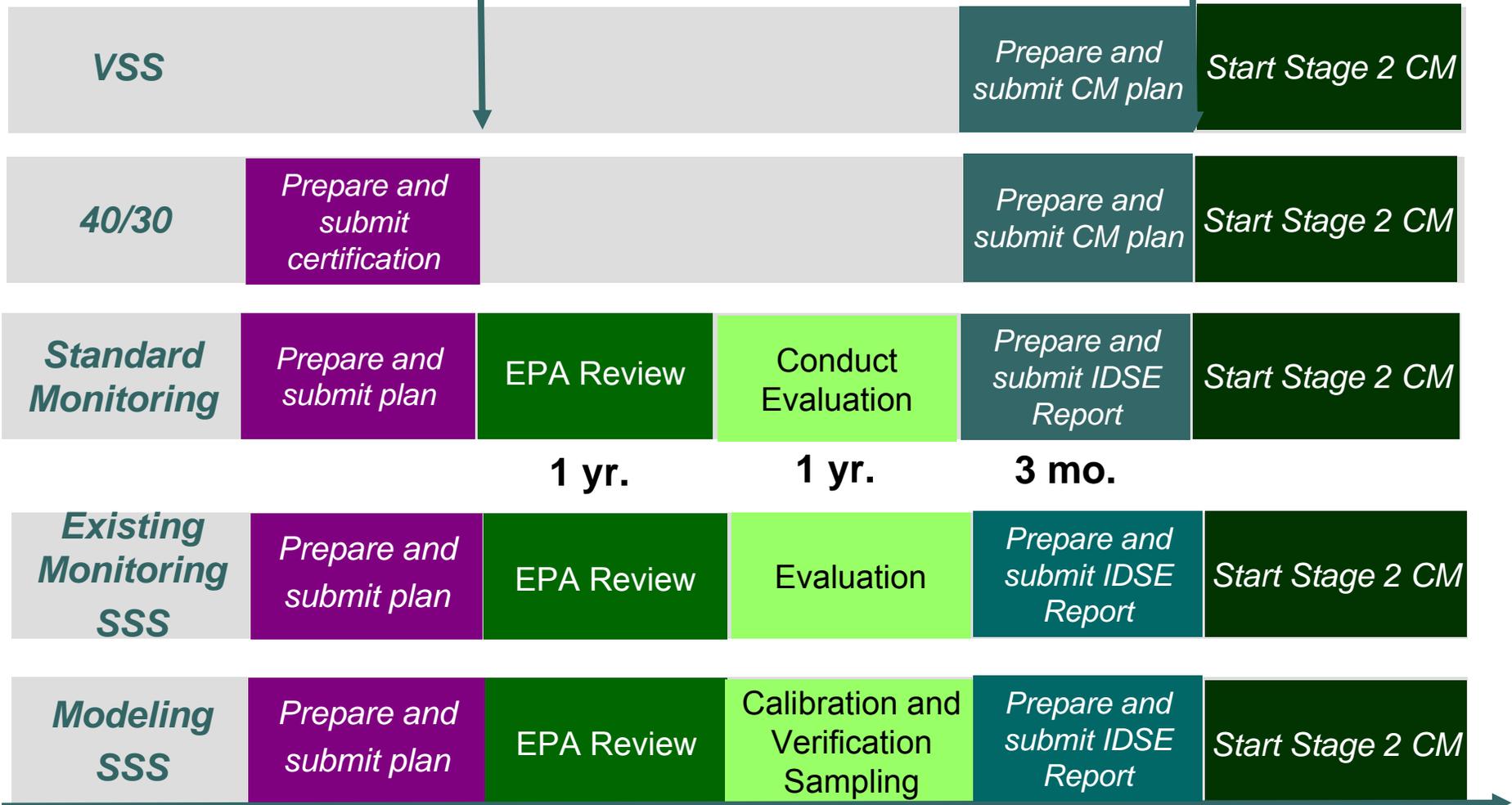
# Reduced Monitoring -Changes from Stage 1

- TTHM and HAA5
  - Surface Water and GWUDI
  - Under Stage 1
    - TTHM  $\leq$  0.040 mg/L
    - HAA5  $\leq$  0.030 mg/L
    - TOC  $\leq$  4.0 mg/L
  - Stage 2 adds:
    - Sample TOC every 30 days to qualify
    - Sample TOC every 90 days to remain
- Bromate
  - Systems that use ozone monitor for Bromate
  - Under Stage 1
    - Reduced monitoring based on Bromide in source
  - Stage 2 adds:
    - New Bromate method
    - No longer have to monitor Bromide in source



Schedule	IDSE Initial Date
1	October 1, 2006
2	April 1, 2007
3	October 1, 2007
4	April 1, 2008

Schedule	Start CM Date
1	April 1, 2012
2	October 1, 2012
3	October 1, 2013
4	Oct 1, 2013 or 2014





# IPMC and DCTS

- Information Processing & Management Center (IPMC)
  - Centralized location to process hard copy Stage 2 DBPR submissions
  - Systems can submit 40/30 Certifications, Standard Monitoring Plans, System Specific Studies, and IDSE Reports
  - Conducts mail distribution and data entry into DCTS

**Mailing Address:**

**Stage 2 DBPR &  
LT2ESWTR IPMC**

**P O Box 98**

**Dayton, OH 45401**

**Fax Number:**

**937-586-6557**

**Email Address:**

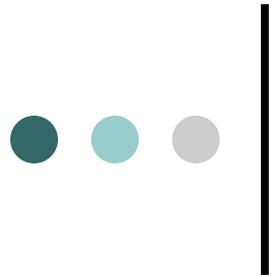
**[stage2mdbp@epa.gov](mailto:stage2mdbp@epa.gov)**



# IPMC and DCTS

- Data Collection & Tracking System (DCTS)
  - Database that tracks and stores Stage 2 DBPR early implementation submissions
  - Gives you access to the online IDSE tool
    - Develop and submit your 40/30 Certification or IDSE Plan or Report online



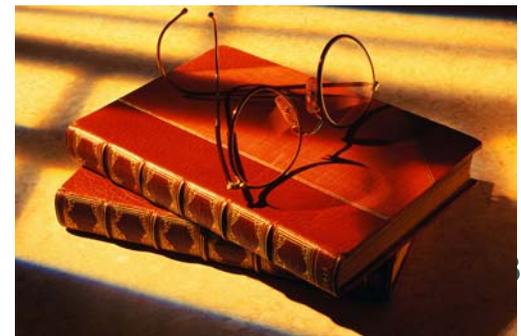


# IDSE Tool

- 2 modules:
  - Wizard
    - Determines which IDSE option is best for the system
  - IDSE Plan/Report Entry
    - Creates custom forms for the selected IDSE option and helps the system complete electronic forms
- Can be accessed online, in CD version, and in hard copy template
- Both online and CD version have access to the Wizard and Plan/Report Entry feature

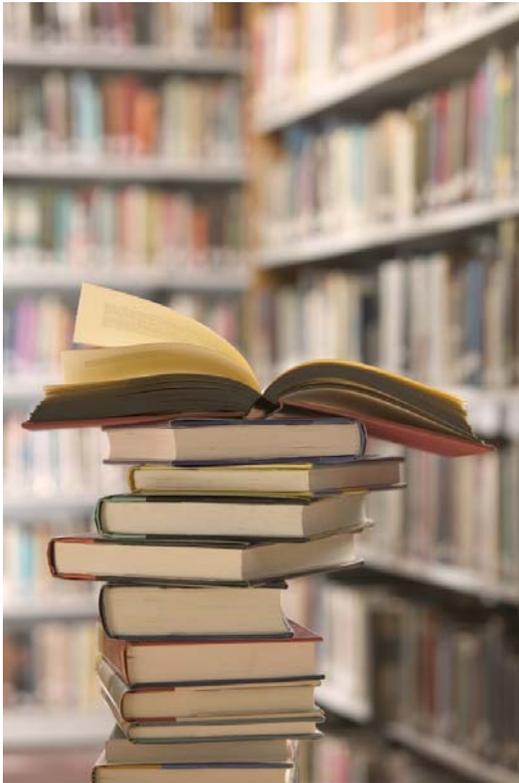
# ● ● ● | Additional Resources

- EPA's Web site:  
[www.epa.gov/safewater/disinfection/stage2/](http://www.epa.gov/safewater/disinfection/stage2/)
- Fact Sheets for the IDSE
- Quick Reference Guides for Schedule 1–4 systems
- IDSE Guidance Manual and Tool





# Additional Resources



- Stage 2 Implementation Guidance Manual
- Draft Simultaneous Compliance Guidance Manual for Stage 2 Rules
- Consecutive Systems Guidance Manual for the Stage 2 DBPR
- Small System Guidance Manual for the Stage 2 DBPR
- Operational Evaluation Guidance Manual



**Questions?**



# Example Standard Monitoring Plan



# Example System

- System Information
  - Population served – 8,000
  - Sources:
    - One surface water source produces 1 MGD
    - Two wells produce 0.5 MGD each
    - One consecutive connection draws 0.1 MGD
      - Wholesale system serves 1 million people
  - Compliance dates based on Schedule 1
    - Wholesale system's schedule

# I. General Information

Form 6: Standard Monitoring Plan		Page 1 of 6
<b>I. GENERAL INFORMATION</b>		
<b>A. PWS Information*</b>		<b>B. Date Submitted</b> September 26, 2006
PWSID: <u>XX1234567</u>		
PWS Name: <u>Big Sandy</u>		
PWS Address: <u>123 Sandy Beach Road</u>		
City: <u>Big Sandy</u> State: <u>XX</u> Zip: <u>12345</u>		
Population Served: <u>8,000</u>		
System Type:	Source Water Type:	Buying / Selling Relationships:
<input checked="" type="checkbox"/> CWS <input type="checkbox"/> NTNCWS	<input checked="" type="checkbox"/> Subpart H <input type="checkbox"/> Ground	<input checked="" type="checkbox"/> Consecutive System <input type="checkbox"/> Wholesale System <input type="checkbox"/> Neither
<b>C. PWS Operations</b>		
Residual Disinfectant Type: <input checked="" type="checkbox"/> Chlorine <input type="checkbox"/> Chloramines <input type="checkbox"/> Other: _____		
Number of Disinfected Sources: <u>1</u> Surface <u>  </u> GWUDI <u>2</u> Ground <u>1</u> Purchased		



# I. General Information

## D. Contact Person\*

Name: Jim Smith

Title: Certified Operator

Phone #: (123) 456-7890

Fax #: N/A

E-mail: N/A



## II. IDSE Requirements

II. IDSE REQUIREMENTS*		
A. Number of Sites:	B. Schedule	C. Standard Monitoring Frequency
Total: <u>4</u>		
Near Entry Point: <u>0</u>	<input checked="" type="checkbox"/> Schedule 1	<input type="checkbox"/> During peak historical month (1 monitoring period)
Avg Residence Time: <u>1</u>	<input type="checkbox"/> Schedule 2	
High TTHM: <u>2</u>	<input type="checkbox"/> Schedule 3	<input checked="" type="checkbox"/> Every 90 days (4 monitoring periods)
High HAA5: <u>1</u>	<input type="checkbox"/> Schedule 4	<input type="checkbox"/> Every 60 days (6 monitoring periods)

# III. Selecting IDSE Standard Monitoring Sites

Form 6: Standard Monitoring Plan					Page 2 of 6
III. SELECTING STANDARD MONITORING SITES					
A. Data Evaluated. Put a "✓" in each box corresponding to the data that you used to select each type of standard monitoring site. Check all that apply.					
Data Type	Type of Site				
	Near Entry Pt.	Avg. Residence Time	High TTHM	High HAA5	
<b>System Configuration</b>					
Pipe layout, locations of storage facilities		✓	✓	✓	
Locations of sources and consecutive system entry points					
Pressure zones			✓	✓	
Information on population density					
Locations of large customers					
<b>Water Quality and Operational Data</b>					
Disinfectant residual data		✓	✓		
Stage 1 DBP data					
Other DBP data					
Microbiological monitoring data (e.g., HPC)					
Tank level data, pump run times					
Customer billing records					
<b>Advanced Tools</b>					
Water distribution system model					
Tracer study					
B. Summary of Data.* Provide a summary of additional data you relied on to justify standard monitoring site selection. You are not required to submit original data. (attach additional sheets if needed)					

# IV. Justification Of IDSE Monitoring Sites

## Form 6. Standard Monitoring Plan

Page 3 of 6

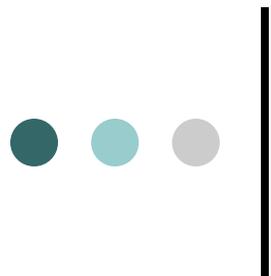
### IV. JUSTIFICATION OF STANDARD MONITORING SITES\*

Standard Monitoring Site ID (from map) <sup>1</sup>	Site Type	Justification
1	<input type="checkbox"/> Near Entry Pt <input checked="" type="checkbox"/> Avg. Res. Time <input type="checkbox"/> High TTHM <input type="checkbox"/> High HAA5	This average residence time site was chosen based on its geographical location, and after looking at disinfectant residual levels throughout the distribution system. This site typically experiences residual levels that are average for the whole system.
2	<input type="checkbox"/> Near Entry Pt <input type="checkbox"/> Avg. Res. Time <input checked="" type="checkbox"/> High TTHM <input type="checkbox"/> High HAA5	This high TTHM site is at the end of a dead end where we have historically had difficulty maintaining a residual. This site also gives us geographic representation as there are no Stage 1 samples in this area.
3	<input type="checkbox"/> Near Entry Pt <input type="checkbox"/> Avg. Res. Time <input checked="" type="checkbox"/> High TTHM <input type="checkbox"/> High HAA5	This site was chosen because it is downgradient of our tank that is at the far end of town from the sources. We anticipate high TTHM due to advanced water age.
4	<input type="checkbox"/> Near Entry Pt <input type="checkbox"/> Avg. Res. Time <input type="checkbox"/> High TTHM <input checked="" type="checkbox"/> High HAA5	We located this HAA5 site downgradient from the booster chlorination in an area with a long residence time. We are concerned that the booster chlorination increases DBP formation. Also the increase in residual will preclude any biodegradation.



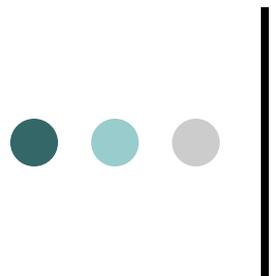
# IV. Justification Of IDSE Monitoring Sites

IDSE Monitoring Site ID	Site Type	Justification
1	<ul style="list-style-type: none"> <li><input type="checkbox"/> Near Entry Pt</li> <li><input checked="" type="checkbox"/> Ave Res. Time</li> <li><input type="checkbox"/> High TTHM</li> <li><input type="checkbox"/> High HAA5</li> </ul>	<p>This average residence time site was chosen based on its geographical location, and after looking at disinfectant residual levels throughout the distribution system. This site typically experiences residual levels that are average for the whole system.</p>



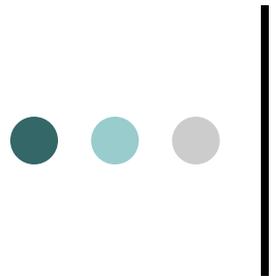
# IV. Justification Of IDSE Monitoring Sites

IDSE Monitoring Site ID	Site Type	Justification
2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Near Entry Pt</li> <li><input type="checkbox"/> Ave Res. Time</li> <li><input checked="" type="checkbox"/> High TTHM</li> <li><input type="checkbox"/> High HAA5</li> </ul>	<p>This high TTHM site is at the end of a dead end where we have historically had difficulty maintaining a residual. This site also gives us geographic representation as there are no Stage 1 samples in this area.</p>



## IV. Justification Of IDSE Monitoring Sites

<b>IDSE Monitoring Site ID</b>	<b>Site Type</b>	<b>Justification</b>
3	<ul style="list-style-type: none"> <li><input type="checkbox"/> Near Entry Pt</li> <li><input type="checkbox"/> Ave Res. Time</li> <li>x High TTHM</li> <li><input type="checkbox"/> High HAA5</li> </ul>	<p>This site was chosen because it is downgradient of our tank that is at the far end of town from the sources. We anticipate high TTHM due to advanced water age.</p>



# IV. Justification Of IDSE Monitoring Sites

<b>IDSE Monitoring Site ID</b>	<b>Site Type</b>	<b>Justification</b>
<p>4</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Near Entry Pt</li> <li><input type="checkbox"/> Ave Res. Time</li> <li><input type="checkbox"/> High TTHM</li> <li>x High HAA5</li> </ul>	<p>We located this HAA5 site down gradient from the booster chlorination in an area with a long residence time. We are concerned that the booster chlorination increases DBP formation. Also the increase in residual will preclude any biodegradation.</p>

# V. Peak Historical Month

## Form 6. Standard Monitoring Plan

Page 4 of 6

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

A. Peak Historical Month:\* August

B. If Multiple Sources, Source Used to Determine Peak Historical Month  
(write "N/A" if only one source in your system):

We used temperature data from our surface water source.

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):

---

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# V. Standard Monitoring Dates

## 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	period 5	period 6
1	11/2007, wk 2	2/2008, wk 2	5/2008, wk 2	8/2008, wk 2		
2	11/2007, wk 2	2/2008, wk 2	5/2008, wk 2	8/2008, wk 2		
3	11/2007, wk 2	2/2008, wk 2	5/2008, wk 2	8/2008, wk 2		
4	11/2007, wk 2	2/2008, wk 2	5/2008, wk 2	8/2008, wk 2		

<sup>1</sup> Site IDs should match IDs in Section IV and on your distribution system schematic (See Section VII of this form). Attach additional copies of this sheet 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)

# VI. Stage 1 DBPR Monitoring Dates

## Form 6. Standard Monitoring Plan

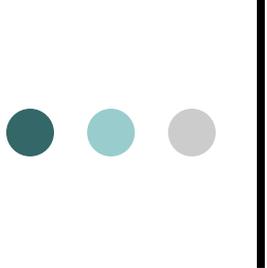
Page 5 of 6

### VI. PLANNED STAGE 1 DBPR COMPLIANCE MONITORING SCHEDULE\*

Stage 1 DBPR 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
A	10/2007, wk 2	1/2008, wk 2	4/2008, wk2	7/2008, wk 2
B	10/2007, wk 2	1/2008, wk 2	4/2008, wk2	7/2008, wk 2

<sup>1</sup> Site IDs should match IDs on your distribution system schematic (See Section VII of this form). Attach additional copies of this sheet if you are required to monitor at more than 8 Stage 1 DBPR sites.

<sup>2</sup> period = monitoring period. Complete for the number of periods in which you must conduct Stage 1 DBPR monitoring during IDSE monitoring. Can list exact date or week (e.g., week of 7/9/07)



# VII. Distribution System Schematic

## VII. DISTRIBUTION SYSTEM SCHEMATIC\*

**ATTACH** a schematic of your distribution system.

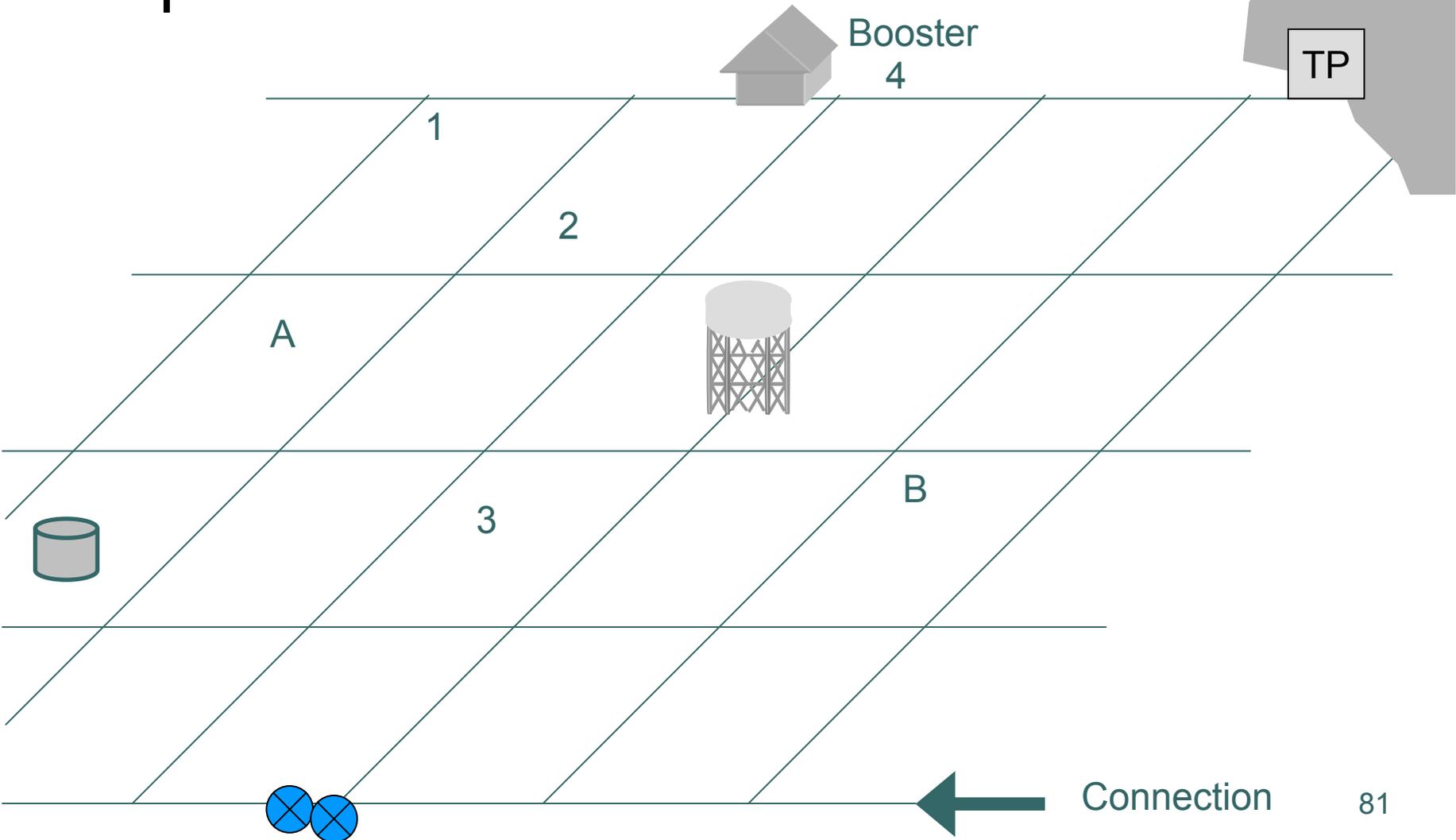
Distribution system schematics should not contain information that poses a *security risk* to your system. EPA recommends that you use one of two options:

**Option 1: Distribution system schematic with no landmarks or addresses indicated.** Show locations of sources, entry points, storage facilities, standard monitoring locations, and Stage 1 compliance monitoring locations (required). Also include pressure zone boundaries and locations of pump stations. Provide map scale.

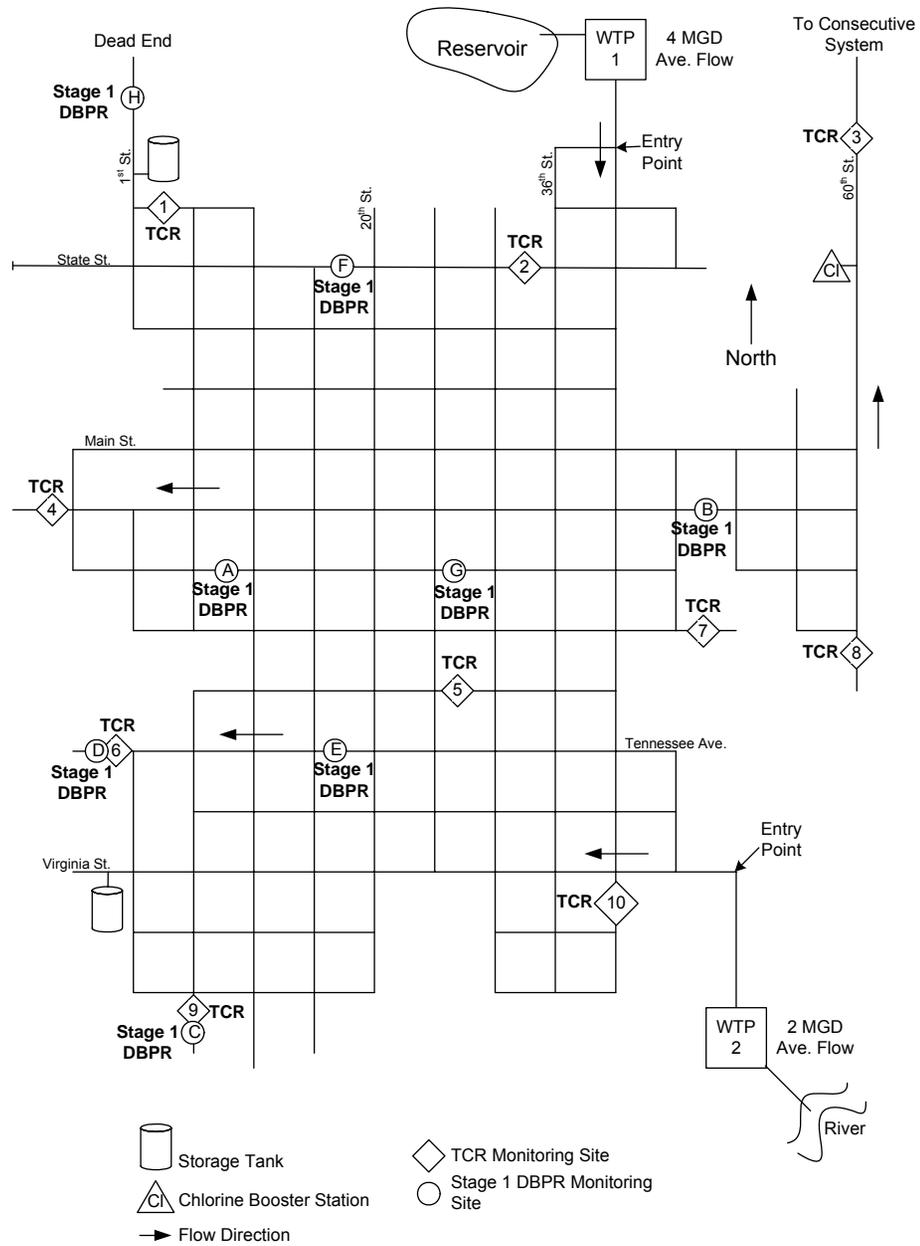
**Option 2: City map without locations of pipes indicated.** Show locations of sources, entry points, storage facilities, standard monitoring locations, and Stage 1 compliance monitoring locations (required). Also include boundaries of the distribution system, pressure zone boundaries and locations of pump stations. Provide map scale.

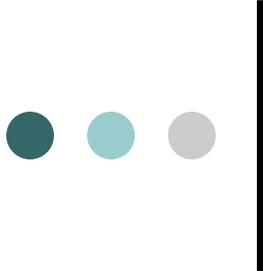


# VII. Distribution System Schematic



### System Schematic – Capital City Water Works





# VIII. Attachments

## Form 6. Standard Monitoring Plan

Page 6 of 6

### VIII. ATTACHMENTS

- Distribution System Schematic (required)
- Additional sheets for the summary of additional data you relied on to justify your standard monitoring site selection (Section III).
- Additional copies of Page 3 for IDSE Standard Monitoring Sites (Section IV).  
**Required if you are a subpart H system serving more than 49,999 people or a ground water system serving more than 499,999 people.**
- Additional sheets for explaining how you used data other than TTHM, HAA5, and temperature data to select your peak historical month (Section V).
- Additional copies of Page 4 for proposed monitoring schedule (Section V).  
**Required if you are a subpart H system serving more than 49,999 people or a ground water system serving more than 499,999 people.**
- Additional sheets for planned Stage 1 DBPR compliance monitoring dates (Section VI).

Total Number of Pages in Your Plan 7