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# **INITIAL DISTRIBUTION SYSTEM EVALUATION GUIDANCE MANUAL**

## **FOR THE FINAL STAGE 2 DISINFECTANTS AND DISINFECTION BYPRODUCTS RULE**

### **CHAPTER 4**

<http://www.epa.gov/safewater/disinfection/stage2>

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## 4.0 40/30 Certification

***This chapter covers:***

- 4.1 Qualification Criteria
- 4.2 Preparing and Submitting the Certification Letter
- 4.3 Recordkeeping
- 4.4 Selecting Stage 2 Compliance Monitoring Sites
- 4.5 Next Steps: Preparing the Stage 2 DBPR Compliance Monitoring Plan

Systems can qualify for the IDSE 40/30 certification if they have measured consistently low total trihalomethane (TTHM) and haloacetic acid-five (HAA5) levels during Stage 1 DBPR compliance monitoring. The term "40/30" refers to a system having all individual Stage 1 DBPR compliance samples less than or equal to 0.040 milligrams per liter (mg/L) for TTHM and 0.030 mg/L for HAA5 during a specific time period.

**If you qualify for the 40/30 certification and comply with the certification requirements**, and EPA or your state does not notify you that you need to conduct an IDSE, ***your system has NO further requirements for the IDSE.*** Your next steps will be to prepare a compliance monitoring plan and start monitoring for the Stage 2 DBPR. You must continue with Stage 1 DBPR monitoring until you begin Stage 2 monitoring.

If you have not already done so, complete the **flowchart** in Exhibit 2.3 of this guidance manual before reading this chapter. The flowchart directs you to a 2-page **Requirements Summary Sheet** which contains compliance dates and additional requirements for complying with the Stage 2 DBPR. You should keep your requirements summary sheet handy as you work through this chapter.

This chapter provides guidance on how to prepare and submit a 40/30 certification letter and select Stage 2 DBPR compliance monitoring sites. If you are a **consecutive or wholesale system**, refer to Appendix D for specific issues that you should consider.

## 4.1 Qualification Criteria

To be eligible for 40/30 certification, you must meet all of the following requirements for the **8 consecutive quarter eligibility period** shown in Exhibit 4.1:

- You have TTHM and HAA5 data equivalent to what is required by the Stage 1 DBPR for your system (e.g., quarterly, annual, or every third year)
- No individual sample exceeds 0.040 mg/L for TTHM
- No individual sample exceeds 0.030 mg/L for HAA5
- Your system did not have any TTHM or HAA5 monitoring violations

**Exhibit 4.1 40/30 Criteria Compliance Dates**

Schedule <sup>1</sup>	Stage 1 DBPR Data Eligibility Period <sup>2</sup>	40/30 Certification Deadline
1	8 consecutive calendar quarters starting no earlier than January 2004	October 1, 2006
2		April 1, 2007
3	8 consecutive calendar quarters starting no earlier than January 2005	October 1, 2007
4		April 1, 2008

Notes:

1. Your schedule is defined by population served by your system or by the largest system in your combined distribution system. See Chapter 2 for more information.
2. If you were not required to sample during this period, use data from the 12-month period prior to the eligibility period shown.

Example 4.1 is an example of a system determining whether they meet the 40/30 criteria.

If you don't have Stage 1 compliance data, EPA or your state may allow you to use operational TTHM and HAA5 data to qualify for 40/30 certification if your sampling and analysis met the general intent of Stage 1 DBPR compliance. Some of the criteria that EPA or your state might use to evaluate your data are below.

- Were samples analyzed by EPA approved methods?
- Were samples analyzed at a certified laboratory?
- Is the number of sites adequate to represent the distribution system?
- Are the sites located appropriately (average and maximum residence time)?
- Were samples taken during the month of warmest water temperature?
- Were samples taken at the appropriate frequency (monthly, quarterly or annually)?

### Example 4.1 Qualifying for a 40/30 Certification

A ground water system serving 8,000 people with two wells has been sampling annually at two locations in their distribution system under the Stage 1 DBPR. Because they do not buy or sell water, this system is on schedule 4. The table below shows their TTHM and HAA5 data for their eligibility period.

	July 21, 2005		July 24, 2006		July 23, 2007	
	TTHM (mg/L)	HAA5 (mg/L)	TTHM (mg/L)	HAA5 (mg/L)	TTHM (mg/L)	HAA5 (mg/L)
Stage 1 Site 1	0.033	0.015	0.037	0.020	0.035	0.021
Stage 1 Site 2	0.040	0.022	0.035	0.021	0.037	0.019

No individual sample exceeded 0.040 mg/L for TTHM or 0.030 mg/L for HAA5. The system does not have any TTHM or HAA5 monitoring violations during the eligibility period. The system determines that they meet the criteria for the 40/30 certification and they submit their certification for the period of January 1, 2006 to December 31, 2007 by their deadline of April 1, 2008.

Depending on the 8 consecutive quarter eligibility period upon which you are basing your certification, you may be sampling right before your certification deadline. If this is the case, you will not know whether you have met the eligibility criteria for 40/30 certification until these last samples are analyzed. If your TTHM or HAA5 results exceed the 40/30 threshold near the end of the period, you must conduct an IDSE through standard monitoring or a system specific study (SSS). The deadlines for submittal of a standard monitoring plan or a SSS plan are the same as the 40/30 certification deadline shown in Exhibit 4.1. Systems may want to consider preparing a standard monitoring plan if they are concerned that they might exceed the 40/30 levels at the end of the eligibility period.

Remember that even if you meet the eligibility criteria and submit the certification, ***EPA or your state may still require you to conduct an IDSE*** using standard monitoring or an SSS. If this occurs, you may need to work with EPA or your state to determine a schedule for completing a standard monitoring or SSS plan and submitting an IDSE report.

## 4.2 Preparing and Submitting the Certification Letter

At a minimum, you **must** prepare and submit a statement certifying that you meet the eligibility criteria in Section 4.1. Your certification should also contain basic system information including population served by your system, your system type (subpart H or ground water, community or non-community), and contact information. EPA has developed a **40/30 Certification Letter Form (Form 1)**, shown on the next page, that can be used by any system to prepare a certification letter. This form is also available electronically as part of the **IDSE Tool**. Example 4.2 is a completed certification form for a hypothetical system.

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**The IDSE Tool** creates a custom 40/30 certification form for your system and submits the completed letter to EPA and your state for you. The tool is available on EPA's website at <http://www.epa.gov/safewater/disinfection/stage2>.



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You must submit your certification letter by the deadline in Exhibit 4.1. You should submit the certification to the Information Processing and Management Center (IPMC) for review by EPA or your state. See Section 1.4 of this guidance manual for information on how to submit your letter to the IPMC. If you do not submit either a 40/30 certification, standard monitoring, or study plan by this deadline, you will incur a monitoring and reporting violation. You can submit the letter as early as you want after you have met the requirements.

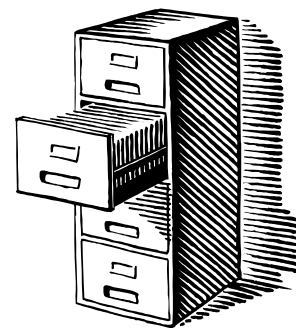
EPA or your state may require you to submit additional information listed below:

- Stage 1 compliance monitoring results
- A distribution system schematic
- Recommended Stage 2 compliance monitoring locations

If the reviewer wants to request additional information or to have you conduct an IDSE, they will contact you. However, you may not receive a confirmation that your 40/30 certification has been accepted. If you do not hear from EPA or your state within 12 months after the submission deadline, you can assume your certification has been accepted.

## 4.3 Recordkeeping

You must retain a complete copy of your 40/30 certification letter on file for **10 years** after you submit it to EPA or your state. You must also make your 40/30 certification letter and any notification from EPA or your state available for review by your state or the public.



STAGE 2 DBPR  
US EPA-IPMC  
P O Box 98  
Dayton, OH 45401-0098

**System Information**

PWS Name: \_\_\_\_\_ PWS ID: \_\_\_\_\_  
Street Address: \_\_\_\_\_ Population Served: \_\_\_\_\_  
City: \_\_\_\_\_  
State: \_\_\_\_\_  
Zip: \_\_\_\_\_

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 Stage 1 monitoring violations during this time period.*

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

## Example 4.2 Completed 40/30 Certification Letter Using Form 1

STAGE 2 DBPR  
US EPA-IPMC  
P O Box 98  
Dayton, OH 45401-0098

### System Information

PWS Name: Hometown PWS ID: US 1234567  
Street Address: 987 Main Street Population Served: 25,976  
City: Hometown  
State: XX  
Zip: 12345

Source Water Type:  Ground  Subpart H  
System Type:  CWS  NTNCWS  
Combined Distribution System:  Wholesale  Consecutive  Neither

### Contact Person

Name: Jim Smith Title: Certified Operator  
Phone Number: 987-6543 Fax Number (if available): \_\_\_\_\_  
Email Address (if available): J.smith@hometown.gov

### Certification

*I hereby certify that each individual Stage 1 DBPR compliance sample collected from March 2005 to February 2007 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 Stage 1 monitoring violations during this time period.*

Signature: Jim Smith Date: May 13, 2007



## 4.4 Selecting Stage 2 Compliance Monitoring Sites

The required number and type of sites for Stage 2 DBPR compliance monitoring are based on your source water type and the population served by your system. Monitoring requirements are summarized on the second page of your *Requirements Summary Sheet* in Chapter 2 and presented again here in Exhibit 4.2. Keep in mind that even if you qualify for reduced monitoring under Stage 2 compliance monitoring, you must still select the required number of monitoring sites as shown in Exhibit 4.2 and include them in your Stage 2 compliance monitoring plan (see Section 4.5 for a summary of compliance monitoring plan requirements).

Due to the change from plant-based monitoring under the Stage 1 DBPR to population-based monitoring for the Stage 2 DBPR, you may have **the same number, more, or fewer** monitoring sites for Stage 2 compared to Stage 1. Compare your required number of Stage 2 DBPR sites to the total number of Stage 1 DBPR monitoring sites for all plants in your system. Depending on your findings, go to the appropriate subsection (4.4.1, 4.4.2, or 4.4.3) for guidance on selecting Stage 2 DBPR compliance monitoring sites.

**Exhibit 4.2 Stage 2 Compliance Monitoring Requirements**

Source Water Type	Population Size Category	Monitoring Frequency <sup>1</sup>	Total Number of Distribution System Monitoring Locations <sup>2</sup>
<b>Subpart H</b>	<500	per year	2
	500-3,300	per quarter	2
	3,301-9,999	per quarter	2
	10,000-49,999	per quarter	4
	50,000-249,999	per quarter	8
	250,000-999,999	per quarter	12
	1,000,000-4,999,999	per quarter	16
	≥5,000,000	per quarter	20
<b>Ground Water</b>	<500	per year	2
	500-9,999	per year	2
	10,000-99,999	per quarter	4
	100,000-499,999	per quarter	6
	≥500,000	per quarter	8

<sup>1</sup> All systems must monitor during the month of highest DBP concentration.

<sup>2</sup> Systems on quarterly monitoring must take dual sample sets every 90 days at each monitoring location, except for subpart H systems serving 500-3,300. Systems on annual monitoring and subpart H systems serving 500-3,300 are required to take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. Only one location with a dual sample set per monitoring period is needed if highest TTHM and HAA5 concentrations occur at the same location (and month, if monitored annually).

#### 4.4.1 You Have THE SAME Number of Stage 1 Sites as Required by the Stage 2 DBPR

If the number of Stage 1 DBPR monitoring locations in your system is exactly the same as the required number of Stage 2 DBPR monitoring locations, continue to use all of your Stage 1 DBPR sites for Stage 2 DBPR compliance monitoring.

#### 4.4.2 You Have MORE Stage 1 Sites than Required by the Stage 2 DBPR

If you have more Stage 1 sites than you need for Stage 2 DBPR monitoring (this could be the case if you have multiple treated entry points in your system), you **must** select the sites with highest DBP levels for Stage 2 monitoring. You must alternate your site selection between locations representing high TTHM levels and high HAA5 levels, starting with high TTHM.

To identify locations representing high TTHM levels and high HAA5 levels, EPA recommends that you use Stage 1 DBPR monitoring results. Specifically, you can use the 4-Step process outlined below:

Step 1: Calculate the locational running annual average (LRAA) TTHM and HAA5 concentrations at each Stage 1 DBPR monitoring site. You should use data for the most recent calendar year, as long as this year is generally representative of typical system conditions.

For systems collecting quarterly data:  
 $LRAA = (Q1 + Q2 + Q3 + Q4) / 4$

For systems collecting annual data (once/year):  
LRAA = result for warmest temperature month

Step 2: Select the site with the highest TTHM LRAA as your first high TTHM site

Step 3: Select the site with the highest HAA5 LRAA not previously selected as your first high HAA5 site

Step 4: Repeat Steps 2 and 3, selecting the next highest sites for TTHM and HAA5 respectively, until the total number of selected sites equals the number of sites required for Stage 2 DBPR compliance monitoring (as shown in Exhibit 4.2)

You can use the site selection Worksheet 4.1 to organize your Stage 1 DBPR data and select Stage 2 DBPR monitoring sites. If you use this form, you should consider keeping it as part of your Stage 2 DBPR monitoring plan (see Section 4.5).

**Worksheet 4.1 Stage 2 DBPR Site Selection for Systems Getting the 40/30 Certification**

***Instructions:*** Enter the site ID and LRAAs for each Stage 1 DBPR monitoring location. You may want to sort your entries in order by TTHM LRAA or HAA5 LRAA values.

As you work through the site selection protocol, fill in the "Stage 2 Site Type" column each time you select a site to indicate whether the site is a high TTHM or high HAA5 site. This will help you to track which sites have already been selected and can help you ensure that you select the required number of each type of site.

Stage 1 DBPR Monitoring Site ID	LRAA		Stage 2 Site Type*
	TTHM (mg/L)	HAA5 (mg/L)	
Example	0.032	0.025	1 <sup>st</sup> high TTHM

\* Enter high TTHM or high HAA5 site

#### 4.4.3 You Have FEWER Stage 1 Sites than Required by the Stage 2 DBPR

If you do not have enough Stage 1 sites to meet Stage 2 DBPR monitoring requirements (this could be the case if you are a large system with very few treatment plants), you **must** select additional sites. You must identify additional locations by alternating selection of locations representing high TTHM and high HAA5. Remember that you will need to provide a justification for the new site selection in your Stage 2 compliance monitoring plan discussed in Section 4.5 below.

General guidelines for selecting candidate locations for high TTHM and high HAA5 sites are provided below. Guidance for final site selection considering other factors follows. If you would like more information about formation of disinfection by-products, refer to Appendix A. In addition, Chapter 7 provides a more in-depth discussion of how to select sites that represent high levels of TTHM or HAA5.

##### *High TTHM sites*

In general, **higher water temperatures** and **increased water age** lead to higher TTHM concentrations. Exhibit 4.3 provides typical characteristics of high TTHM sites. Storage facilities in a distribution system typically increase water age. Therefore, if your system has storage tanks or reservoirs, you should locate high TTHM sites downstream of those tanks. In addition, sites near dead ends and sparsely populated residential areas can be likely sites for high TTHM. Be sure to locate the sites before or at the last group of customers on a dead end line. Samples taken at the very end of a dead end line are not representative of the water received by customers.

#### **Exhibit 4.3 Typical Characteristics of High TTHM Sites**

High TTHM sites are often located:

- hydraulically downstream of storage facilities
- near the ends of the distribution system, at or before the last group of customers
- in hydraulic dead-ends, where flow of water is low or stagnant
- prior to the last fire hydrant

Sample sites should not be located:

- at a dead-end where there are no customers.
- prior to booster disinfection with chlorine

## High HAA5 Sites

As with TTHM, higher temperatures and increased residence time can lead to higher HAA5 concentrations. However, **HAA5 can biodegrade** where biological activity is present and disinfectant residual levels are low or non-existent. Therefore, you should consider locating high HAA5 sites where disinfectant residuals are significantly less than the system average (indicating a long residence time), but **avoid areas that have very low or no residual**. When booster disinfection is applied, the disinfectant residual will increase despite advanced water age. HAA5 levels are likely to increase after a booster disinfectant is applied due to the greater concentration of disinfectant available to react with DBP precursors and the lack of biological activity in these areas. Therefore, if your system practices booster disinfection, you should locate high HAA5 sites after booster disinfection is applied.

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You should **not** select high HAA5 sites in locations that regularly or in the summer months have free chlorine residuals less than 0.2 mg/L or with chloramine residuals less than 0.5 mg/L.

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## Final Site Selection

Once you have considered the likely high TTHM and HAA5 locations in your distribution system, you will choose the best locations for monitoring. Consider the following issues when making these choices.

- Select sites that provide the best geographic and hydraulic representation.
- Make sure that you have located sites in as many key areas as possible. These would include isolated portions of the distribution system, areas downstream of tanks, areas downstream of booster chlorination, and within each pressure zone.
- Consider site access issues as each selected site must remain accessible over the long term.

## 4.5 Next Steps: Preparing the Stage 2 DBPR Compliance Monitoring Plan

As the final step before you can begin compliance monitoring for the Stage 2 DBPR, you must develop a **Stage 2 DBPR compliance monitoring plan**. The plan will be similar to your Stage 1 DBPR monitoring plan in that it will identify how you intend to sample for compliance with Stage 2. You must keep your plan on file for state and public review. If you are a subpart H system serving > 3,300 people, you **must** also submit your plan to EPA or your state prior to when you are required to start monitoring.

Exhibit 4.4 contains the minimum requirements for what must be included in your Stage 2 DBPR compliance monitoring plan. Because compliance monitoring plans are not addressed as part of the IDSE provisions of the Stage 2 DBPR, **EPA has not included detailed guidance for developing Stage 2 compliance monitoring plans in this guidance manual**. EPA plans to develop other manuals and training that specifically address the compliance monitoring provisions of the Stage 2 DBPR.

See EPA's website at <http://www.epa.gov/safewater/disinfection/stage2> for an up-to-date inventory of Stage 2 DBPR guidance manuals and training materials, or call the Safe Drinking Water Hotline at 1-800-426-4791.

**Exhibit 4.4 Required Contents of Stage 2 DBPR Compliance Monitoring Plans**

<b>All Systems</b>	<b>Additional Requirements for Systems Getting the 40/30 Certification</b>	<b>Additional Requirements for Consecutive and Wholesale Systems<sup>1</sup></b>
<ul style="list-style-type: none"> <li>• Monitoring locations</li> <li>• Monitoring dates</li> <li>• Compliance calculation procedures</li> </ul>	<ul style="list-style-type: none"> <li>• If you had FEWER Stage 1 DBPR compliance monitoring sites than required by the Stage 2 DBPR, you must include the rationale for identifying locations as having high levels of TTHM or HAA5</li> </ul>	<ul style="list-style-type: none"> <li>• If your state has used its special primacy authority to modify your monitoring requirements, you must include monitoring plans for other systems in your combined distribution system</li> </ul>

1. See Appendix D of this manual for guidance specifically for consecutive and wholesale systems.