

**Part XXII**  
**Initial Distribution System Evaluations**

**§2201 GENERAL REQUIREMENTS**

- A. The regulations in this part establish monitoring and other requirements for identifying Part XXIII compliance monitoring locations for determining compliance with maximum contaminant levels for total trihalomethanes (TTHM) and haloacetic acids (five)(HAA5). The public water system owner/operator must use an Initial Distribution System Evaluation (IDSE) to determine locations with representative high TTHM and HAA5 concentrations throughout the distribution system. IDSEs are used in conjunction with, but separate from, Part XI compliance monitoring, to identify and select Part XXIII compliance monitoring locations.
- B. Applicability. An owner/operator is subject to these requirements if a system is a community water system that uses a primary or residual disinfectant other than ultraviolet light or delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light; or if the system is a nontransient noncommunity water system that serves at least 10,000 people and uses a primary or residual disinfectant other than ultraviolet light or delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light.
- C. Schedule.
1. The owner/operator must comply with the requirements of this part according to the schedule in Table 2200.1.

**Table 2200.1 SCHEDULE REQUIREMENTS by POPULATION and SYSTEM TYPE**

If system serves this population	The public water system owner/operator must submit a standard monitoring plan or system specific study plan <sup>1</sup> or 40/30 certification <sup>2</sup> to the Director by or receive very small system waiver from Director	The public water system owner/operator must complete a standard monitoring or system specific study by	The public water system owner/operator must submit an IDSE report to the Director by <sup>3</sup>
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Systems that are not part of a combined distribution system and systems that serve the largest population in the combined distribution system

(a) ≥100,000....	October 1, 2006	September 30, 2008	January 1, 2009
(b) 50,000-99,999	April 1, 2007	March 31, 2009	July 1, 2009
(c) 10,000-49,999	October 1, 2007	September 30, 2009	January 1, 2010
(d) <10,000 (CWS Only)	April 1, 2008	March 31, 2010	July 1, 2010

Other systems that are part of a combined distribution system

(e) Wholesale system or consecutive system.	--at the same time as the system with the earliest compliance date in the combined distribution system.	--at the same time as the system with the earliest compliance date in the combined distribution system.	--at the same time as the system with the earliest compliance date in the combined distribution system.
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<sup>1</sup>If, within 12 months after the date identified in this column, the Director does not approve the plan or notify the system that it has not yet completed its review, the owner/operator may consider the plan that was submitted as approved. The owner/operator must implement that plan and complete standard monitoring or a system specific study no later than the date identified in the third column.

<sup>2</sup>The owner/operator must submit a 40/30 certification under § 2204 by the date indicated.

<sup>3</sup>If, within three months after the date identified in this column (nine months after the date identified in this column if the owner/operator must comply on the schedule in paragraph (C)(1)(c) of this section), the Director does not approve the IDSE report or notify the owner/operator that it has not yet completed its review, the owner/operator may consider the report that was submitted as approved and the owner/operator must implement the recommended Part XXIII monitoring as required.

2. For the purpose of the schedule in paragraph (C)(1) of this section, the Director may

determine that the combined distribution system does not include certain consecutive systems based on factors such as receiving water from a wholesale system only on an emergency basis or receiving only a small percentage and small volume of water from a wholesale system. The Director may also determine that the combined distribution system does not include certain wholesale systems based on factors such as delivering water to a consecutive system only on an emergency basis or delivering only a small percentage and small volume of water to a consecutive system.

- D. The owner/operator must conduct standard monitoring that meets the requirements in § 2202, or a system specific study that meets the requirements in § 2203, or certify to the Director that the owner/operator meets the 40/30 certification criteria under § 2204, or qualifies for a very small system waiver under § 2205.
  - 1. The owner/operator must have taken the full complement of routine TTHM and HAA5 compliance samples required of a system with the same population and source water under Part XI of these regulations (or the owner/operator must have taken the full complement of reduced TTHM and HAA5 compliance samples required of a system with the same population and source water under Part XI if the owner/operator meet reduced monitoring criteria under Part XI of these regulations) during the period specified in § 2204 (A) to meet the 40/30 certification criteria in § 2204. The owner/operator must have taken TTHM and HAA5 samples under Appendix E-1101-E and 1103 to be eligible for the very small system waiver in § 2205.
  - 2. If the owner/operator has not taken the required samples, the owner/operator must conduct standard monitoring that meets the requirements in § 2202, or a system specific study that meets the requirements in § 2203.
- E. The owner/operator must use only the analytical methods specified in Appendix E-1101-E, or otherwise approved by EPA for monitoring under this subpart, to demonstrate compliance with the requirements of this subpart.
- F. IDSE results will not be used for the purpose of determining compliance with MCLs in § 207.

#### **§2202 STANDARD MONITORING**

- A. Standard monitoring plan. The standard monitoring plan must comply with paragraphs (A)(1) through (A)(4) of this section. The owner/operator must prepare and submit a standard monitoring plan to the Director according to the schedule in § 2201 (C).
  - 1. The standard monitoring plan must include a schematic of the distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating locations and dates of all projected standard monitoring, and all projected Part XI compliance monitoring.
  - 2. The standard monitoring plan must include a justification of the standard monitoring location selection and a summary of data the owner/operator relied on to justify the standard monitoring location selection.
  - 3. The standard monitoring plan must specify the population served and system type (Part VIII or ground water).
  - 4. The owner/operator must retain a complete copy of the standard monitoring plan submitted under this subsection (A), including any Director modification of the standard monitoring plan, for as long as the owner/operator is required to retain an IDSE report under paragraph (C)(4) of this section.
- B. Standard monitoring.
  - 1. The owner/operator must monitor as indicated in Table 2200.2. The owner/operator must collect dual sample sets at each monitoring location. One sample in the dual sample set must be analyzed for TTHM. The other sample in the dual sample set must be analyzed for HAA5. The owner/operator must conduct one monitoring period during the peak historical month for TTHM levels or HAA5 levels or the month of warmest water temperature. The owner/operator must review available compliance, study, or operational data to determine the peak historical month for TTHM or HAA5 levels or warmest water temperature.

**TABLE 2200.2 STANDARD MONITORING PERIODS, FREQUENCY, and LOCATION by POPULATION AND SYSTEM TYPE**

Source water type	Population size category	Monitoring periods and frequency of sampling	Distribution system monitoring locations <sup>1</sup>				
			Total per monitoring period	Near entry points	Average residence time	High TTHM locations	High HAA5 locations
Part VIII	< 500 consecutive systems	one (during peak historical month) <sup>2</sup>	2	1	.....	1	
	< 500 non-consecutive systems	.....	2	.....	.....	1	1
	500-3,300 consecutive systems	four (every 90 days)...		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
	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
Ground Water:	<500 consecutive systems	one (during peak historical month) <sup>2</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
	100,000-499,999	.....	8	1	1	3	3
	≥500,000	.....	12	2	2	4	4

<sup>1</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>2</sup>The peak historical month is the month with the highest TTHM or HAA5 levels or the warmest water temperature.

2. The owner/operator must take samples at locations other than the existing Part XI monitoring locations. Monitoring locations must be distributed throughout the distribution system.
  3. If the number of entry points to the distribution system is fewer than the specified number of entry point monitoring locations, excess entry point samples must be replaced equally at high TTHM and HAA5 locations. If there is an odd extra location number, the owner/operator must take a sample at a high TTHM location. If the number of entry points to the distribution system is more than the specified number of entry point monitoring locations, the owner/operator must take samples at entry points to the distribution system having the highest annual water flows.
  4. Monitoring under this subsection (B) may not be reduced under the provisions of § 1902 and the Director may not reduce monitoring using the provisions of § 142.16(m).
- C. IDSE report. The owner/operator's IDSE report must include the elements required in paragraphs (C)(1) through (C)(4) of this section. The owner/operator must submit an IDSE report to the Director according to the schedule in § 2201 (C).
1. The IDSE report must include all TTHM and HAA5 analytical results from Part XI compliance monitoring and all standard monitoring conducted during the period of the IDSE as individual analytical results and LRAAs presented in a tabular or spreadsheet format acceptable to the Director. If changed from the standard monitoring plan submitted under subsection (A) of this section, the report must also include a schematic of the distribution system, the population served, and system type (Part VIII or ground water).
  2. The IDSE report must include an explanation of any deviations from the approved standard monitoring plan.
  3. The owner/operator must recommend and justify Part XXIII compliance monitoring locations and timing based on the protocol in § 2206.

4. The owner/operator must retain a complete copy of the IDSE report submitted under this section for 10 years after the date that the owner/operator submitted the report. If the Director modifies the Part XXIII monitoring requirements that the owner/operator recommended in the IDSE report or if the Director approves alternative monitoring locations, the owner/operator must keep a copy of the Director's notification on file for 10 years after the date of the Director's notification. The owner/operator must make the IDSE report and any Director notification available for review by the Director or the public.

**§2203 SYSTEM SPECIFIC STUDIES**

A. System specific study plan. The owner/operator's system specific study plan must be based on either existing monitoring results as required under paragraph (A)(1) of this section or modeling as required under paragraph (A)(2) of this section. The owner/operator must prepare and submit a system specific study plan to the Director according to the schedule in § 2201 (C).

1. Existing monitoring results. The owner/operator may comply by submitting monitoring results collected before the owner/operator is required to begin monitoring under §2201 (C). The monitoring results and analysis must meet the criteria in paragraphs (A)(1)(a) and (A)(1)(b) of this section.

a. Minimum requirements.

- i. TTHM and HAA5 results must be based on samples collected and analyzed in accordance with Appendix E-1101-E. Samples must be collected no earlier than five years prior to the study plan submission date.
- ii. The monitoring locations and frequency must meet the conditions identified in this paragraph (A)(1)(a)(ii). Each location must be sampled once during the peak historical month for TTHM levels or HAA5 levels or the month of warmest water temperature for every 12 months of data submitted for that location. Monitoring results must include all Part XI compliance monitoring results plus additional monitoring results as necessary to meet minimum sample requirements.

**TABLE 2200.3 SAMPLE REQUIREMENTS FOR TTHM and HAA5**

System Type	Population size category	Number of monitoring locations	Number of samples	
			TTHM	HAA5
Part VIII:	< 500	3	3	3
	500-3,300	3	9	9
	3,301-9,999	6	36	36
	10,000-49,999	12	72	72
	50,000-249,999	24	144	144
	250,000-999,999	36	216	216
	1,000,000-4,999,999	48	288	288
	≥5,000,000	60	360	360
Ground Water:	< 500	3	3	3
	500-9,999	3	9	9
	10,000-99,999	12	48	48
	100,000-499,999	18	72	72
	≥500,000	24	96	96

a Reporting monitoring results. The owner/operator must report the information in this paragraph (A)(1)(b).

- i. The owner/operator must report previously collected monitoring results and certify that the reported monitoring results include all compliance and non-compliance results generated during the period beginning with the first reported result and ending with the most recent Part XI results.
- ii. The owner/operator must certify that the samples were representative of the entire distribution system and that treatment, and distribution system has not changed significantly since the samples were collected.
- iii. The owner/operator's study monitoring plan must include a schematic of the distribution system (including distribution system entry points and their

sources, and storage facilities) with notes indicating the locations and dates of all completed or planned system specific study monitoring.

- iv. The system specific study plan must specify the population served and system type (Part VIII or ground water).
- v. The owner/operator must retain a complete copy of the system specific study plan submitted under this paragraph (A)(1), including any Director modification of the system specific study plan, for as long as the owner/operator is required to retain an IDSE report under paragraph (B)(5) of this section.
- vi. If the owner/operator submits previously collected data that fully meet the number of samples required under paragraph (A)(1)(a)(I) of this section and the Director rejects some of the data, the owner/operator must either conduct additional monitoring to replace rejected data on a schedule the Director approves or conduct standard monitoring under § 2202.

2. Modeling. The public water system owner/operator may comply through analysis of an extended period simulation hydraulic model. The extended period simulation hydraulic model and analysis must meet the criteria in this paragraph (A)(2).

a Minimum requirements.

- i. The model must simulate 24 hour variation in demand and show a consistently repeating 24 hour pattern of residence time.
- ii. The model must represent the criteria listed in paragraphs (A)(2)(a)(ii)(1) through (9) of this section
  - 1. 75% of pipe volume;
  - 2. 50% of pipe length;
  - 3. All pressure zones;
  - 4. All 12-inch diameter and larger pipes;
  - 5. All 8-inch and larger pipes that connect pressure zones, influence zones from different sources, storage facilities, major demand areas, pumps, and control valves, or are known or expected to be significant conveyors of water;
  - 6. All 6-inch and larger pipes that connect remote areas of a distribution system to the main portion of the system;
  - 7. All storage facilities with standard operations represented in the model;
  - 8. All active pump stations with controls represented in the model; and
  - 9. All active control valves.
- iii. The model must be calibrated, or have calibration plans, for the current configuration of the distribution system during the period of high TTHM formation potential. All storage facilities must be evaluated as part of the calibration process. All required calibration must be completed no later than 12 months after plan submission.

b Reporting modeling. The public water system specific study plan must include the information in this paragraph (A)(2)(b).

- i. Tabular or spreadsheet data demonstrating that the model meets requirements in paragraph (A)(2)(a)(ii) of this section.
- ii. A description of all calibration activities undertaken and, if calibration is complete, a graph of predicted tank levels versus measured tank levels for the storage facility with the highest residence time in each pressure zone, and a time series graph of the residence time at the longest residence time storage facility in the distribution system showing the predictions for the entire simulation period (i.e., from time zero until the time it takes for the model to reach a consistently repeating pattern of residence time).
- iii. Model output showing preliminary 24 hour average residence time predictions throughout the distribution system.
- iv. Timing and number of samples representative of the distribution system planned for at least one monitoring period of TTHM and HAA5 dual sample monitoring at a number of locations no less than would be required for the system under standard monitoring in § 2202 during the historical month of high TTHM. These samples must be taken at locations other than existing Part XI compliance monitoring locations.

- v. Description of how all requirements will be completed no later than 12 months after the owner/operator submits a system specific study plan.
  - vi. Schematic of the distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating the locations and dates of all completed system specific study monitoring (if calibration is complete) and all Part XI compliance monitoring.
  - vii. Population served and system type (Part VIII or ground water).
  - viii. The owner/operator must retain a complete copy of the system specific study plan submitted under this paragraph (A)(2), including any Director modification of the system specific study plan, for as long as the owner/operator is required to retain an IDSE report under paragraph (B)(7) of this section.
- c If the owner/operator submits a model that does not fully meet the requirements under paragraph (A)(2) of this section, the owner/operator must correct the deficiencies and respond to Director inquiries concerning the model. If the owner/operator fails to correct deficiencies or respond to inquiries to the Director's satisfaction, the owner/operator must conduct standard monitoring under § 2202.

B. IDSE report. The IDSE report must include the elements required in paragraphs (B)(1) through (B)(6) of this section. The owner/operator must submit the IDSE report according to the schedule in § 2201 (C).

- 1. The IDSE report must include all TTHM and HAA5 analytical results from Part XI compliance monitoring and all system specific study monitoring conducted during the period of the system specific study presented in a tabular or spreadsheet format acceptable to the Director. If changed from the system specific study plan submitted under subsection (A) of this section, an IDSE report must also include a schematic of the distribution system, the population served, and system type (Part VIII or ground water).
- 2. If the owner/operator used the modeling provision under paragraph (A)(2) of this section, the owner/operator must include final information for the elements described in paragraph (A)(2)(b) of this section, and a 24-hour time series graph of residence time for each Part XXIII compliance monitoring location selected.
- 3. The owner/operator must recommend and justify Part XXIII compliance monitoring locations and timing based on the protocol in § 2206.
- 4. The IDSE report must include an explanation of any deviations from the approved system specific study plan.
- 5. The IDSE report must include the basis (analytical and modeling results) and justification the owner/operator used to select the recommended Part XXIII monitoring locations.
- 6. The owner/operator may submit the IDSE report in lieu of the system specific study plan on the schedule identified in § 2201 (C) for submission of the system specific study plan if the owner/operator believes that it has the necessary information by the time that the system specific study plan is due. If the owner/operator elects this approach, the IDSE report must also include all information required under subsection (A) of this section.
- 7. The owner/operator must retain a complete copy of the IDSE report submitted under this section for 10 years after the date that the owner/operator submitted the IDSE report. If the Director modifies the Part XXIII monitoring requirements that the owner/operator recommended in the IDSE report or if the Director approves alternative monitoring locations, the owner/operator must keep a copy of the Director's notification on file for 10 years after the date of the Director's notification. The owner/operator must make the IDSE report and any Director notification available for review by the Director or the public.

**§2204 40/30 CERTIFICATION**

A. Eligibility. An owner/operator is eligible for 40/30 certification if its system had no TTHM or HAA5 monitoring violations under Part XI of these regulations and no individual sample exceeded 0.040 mg/L for TTHM or 0.030 mg/L for HAA5 during an eight consecutive calendar quarter period beginning no earlier than the date specified in this subsection (A).

**TABLE 2200.4 40/30 CERTIFICATION ELIGIBILITY and DUE DATES for TTHM and HAA5**

If your 40/30 certification is due	Then your eligibility for 40/30 certification is based on eight consecutive calendar quarters of Part XI compliance monitoring results beginning no earlier than <sup>1</sup>
(1) October 1, 2006 (2) April 1, 2007 (3) October 1, 2007 (4) April 1, 2008	January 2004 January 2004 January 2005 January 2005

<sup>1</sup>Unless the public water system is on reduced monitoring under Part XI of this part and was not required to monitor during the specified period. If the owner/operator did not monitor during the specified period, the owner/operator must base its eligibility on compliance samples taken during the 12 months preceding the specified period.

**B. 40/30 certification.**

1. The owner/operator must certify to the Director that every individual compliance sample taken under Part XI of these regulations during the periods specified in subsection (A) of this section were #0.040 mg/L for TTHM and #0.030 mg/L for HAA5, and that the public water system has not had any TTHM or HAA5 monitoring violations during the period specified in subsection (A) of this section.
2. The Director may require the owner/operator to submit compliance monitoring results, distribution system schematics, and/or recommended Part XXIII compliance monitoring locations in addition to the certification. If the owner/operator fails to submit the requested information, the Director may require standard monitoring under § 2202 or a system specific study under § 2203.
3. The Director may still require standard monitoring under § 2202 or a system specific study under § 2203 even if the owner/operator meets the criteria in subsection (A) of this section.
4. The owner/operator must retain a complete copy of the certification submitted under this section for 10 years after the date that the owner/operator submitted the certification. The owner/operator must make the certification, all data upon which the certification is based, and any Director notification available for review by the Director or the public.

**§2205 VERY SMALL SYSTEM WAIVERS**

- A. If the public water system serves fewer than 500 people and the owner/operator has taken TTHM and HAA5 samples under Part XI of these regulations, the owner/operator is not required to comply with this Part unless the Director notifies the owner/operator that the owner/operator must conduct standard monitoring under § 2202 or a system specific study under § 2203.
- B. If the owner/operator has not taken TTHM and HAA5 samples under Part XI of these regulations or if the Director notifies the owner/operator that the owner/operator must comply with this Part, the owner/operator must conduct standard monitoring under § 2202 or a system specific study under § 2203.

**§2206 PART XXIII COMPLIANCE MONITORING LOCATION RECOMMENDATIONS**

- A. The IDSE report must include recommendations and justification for where and during what month(s) TTHM and HAA5 monitoring for Part XXIII of these regulations should be conducted. The owner/operator must base the recommendations on the criteria in subsections (B) through (E) of this section.
- B. The owner/operator must select the number of monitoring locations specified in Table 2200.5. The owner/operator will use these recommended locations as Part XXIII routine compliance monitoring locations, unless the Director requires different or additional locations. The owner/operator should distribute locations throughout the distribution system to the extent possible.

**TABLE 2200.5 RECOMMENDED COMPLIANCE MONITORING PERIODS, FREQUENCY, and LOCATION by POPULATION and SYSTEM TYPE**

Source Water	Population Size	Monitoring	Distribution system monitoring location			
			Total per monitoring	Highest TTHM	Highest HAA5	Existing Part XI

Type	Category	frequency <sup>1</sup>	period <sup>2</sup>	locations	locations	compliance locations
Part VIII:	<500	per year	2	1	1	.....
	500-3,300	per quarter	2	1	1	
	3,301-9,999	per quarter	2	1	1	.....
	10,000-49,999	per quarter	4	2	1	1
	50,000-249,999	per quarter	8	3	3	2
	250,000-999,999	per quarter	12	5	4	3
	1,000,000-	per quarter	16	6	6	4
	≥5,000,000	per quarter	20	8	7	5
Ground water:	<500	per year	2	1	1	
	500-9,999	per year	2	1	1	
	10,000-99,999	per quarter	4	2	1	1
	100,000-499,999	per quarter	6	3	2	1
	≥500,000	per quarter	8	3	3	2

<sup>1</sup>All systems must monitor during the month of highest D.P. concentrations.

<sup>2</sup>Systems on quarterly monitoring must take dual sample sets every 90 days at each monitoring location, except for Part VIII systems serving 500-3,300 persons. Ground water systems serving 500-9,999 on annual monitoring must take dual sample sets at each monitoring location. All other systems on annual monitoring and Part VIII systems serving 500-3,300 persons 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. For systems serving fewer than 500 people, only one location with a dual sample set per monitoring period is needed if the highest TTHM and HAA5 concentrations occur at the same location, and month.

C. The owner/operator must recommend Part XXIII compliance monitoring locations based on standard monitoring results, system specific study results, and Part XI compliance monitoring results. The owner/operator must follow the protocol in paragraphs (C)(1) through (C)(8) of this section. If required to monitor at more than eight locations, owner/operator must repeat the protocol as necessary. If the owner/operator does not have existing Part XI compliance monitoring results or if the owner/operator does not have enough existing Part XI compliance monitoring results, the owner/operator must repeat the protocol, skipping the provisions of paragraphs (C)(3) and (C)(7) of this section as necessary, until the owner/operator has identified the required total number of monitoring locations.

1. Location with the highest TTHM LARA not previously selected as a Part XXIII monitoring location.
2. Location with the highest HAA5 LARA not previously selected as a Part XXIII monitoring location.
3. Existing Part XI average residence time compliance monitoring location (maximum residence time compliance monitoring location for ground water systems) with the highest HAA5 LARA not previously selected as a Part XXIII monitoring location.
4. Location with the highest TTHM LARA not previously selected as a Part XXIII monitoring location.
5. Location with the highest TTHM LARA not previously selected as a Part XXIII monitoring location.
6. Location with the highest HAA5 LARA not previously selected as a Part XXIII monitoring location.
7. Existing Part XI average residence time compliance monitoring location (maximum residence time compliance monitoring location for ground water systems) with the highest TTHM LARA not previously selected as a Part XXIII monitoring location.
8. Location with the highest HAA5 LARA not previously selected as a Part XXIII monitoring location.

D. The owner/operator may recommend locations other than those specified in subsection (C) of this section if the owner/operator includes a rationale for selecting other locations. If the Director approves the alternate locations, the owner/operator must monitor at these locations to determine compliance under Part XXIII of these regulations.

E. The recommended schedule must include Part XXIII monitoring during the peak historical month for TTHM and HAA5 concentration, unless the Director approves another month. Once the owner/operator has identified the peak historical month, and if the owner/operator is required to conduct routine monitoring at least quarterly, the owner/operator must schedule Part XXIII compliance monitoring at a regular frequency of every 90 days or fewer.