

3745-81-24 **Organic chemical monitoring requirements.**

Monitoring requirements for organic chemical contaminants of drinking water are stated in this rule. Analytical procedures which are acceptable for monitoring for organic contaminants in drinking water are listed in rule 3745-81-27 of the Administrative Code. Analyses under this rule shall only be conducted by laboratories that are certified for these analyses under Chapter 3745-89 of the Administrative Code. Community public water systems and nontransient noncommunity public water systems shall monitor for organic chemicals according to a schedule provided by the director.

- (A) Monitoring for volatile organic chemicals with maximum contaminant levels (MCLs) listed in paragraph (D) of rule 3745-81-12 of the Administrative Code shall be conducted by community public water systems and nontransient noncommunity public water systems as follows:
- (1) Groundwater systems shall monitor with a minimum of one sample at each respective sampling point during each compliance period. Surface water systems shall monitor with a minimum of one sample annually at each sampling point. After the first set of samples, each repeat sample shall be taken at the same sampling point as used before unless conditions make another sampling point more representative of a source, treatment plant, or part of the distribution system.
 - (2) If a public water system draws water from more than one source and the sources are combined before distribution, the public water system shall monitor at each sampling point during periods of normal operating conditions and shall keep a record of and report the sources providing water for each sample. When a sample does not contain water from all the sources which serve the sampling point, the public water system shall prepare and follow a schedule such that the next monitoring sample at this sampling point for the same volatile organic chemicals will include water from sources not included in the previous sample or samples. Thus, successive samples from the same sampling point for the same volatile organic chemicals shall sample water supplied from different sources until all the sources supplying that sampling point have been monitored.
 - (3) Each new community and new nontransient noncommunity public water system and public water systems that use a new source of water shall monitor initially with four consecutive quarterly samples for each contaminant listed in paragraph (D) of rule 3745-81-12 of the Administrative Code beginning in the first quarter of the next calendar

year after operation of the new source of system begins. New public water systems shall sample at each sampling point; systems with a new source of water shall sample at the sampling point related to the new source.

- (4) If the initial monitoring for the contaminants listed in paragraph (D) of rule 3745-81-12 of the Administrative Code has been completed and the public water system did not detect any contaminant listed in paragraph (D) of rule 3745-81-12 of the Administrative Code, then the public water system shall monitor with one sample annually. For any contaminant detected during the initial monitoring, the public water system shall continue quarterly monitoring until eligible for a reduction under paragraph (A)(6)(b) of this rule.
- (5) The director may, after a minimum of three years of annual monitoring with no detection of any contaminant listed in paragraph (D) of rule 3745-81-12 of the Administrative Code, reduce monitoring by a groundwater system to one sample during each compliance period.
- (6) If a contaminant listed in paragraph (D) of rule 3745-81-12 of the Administrative Code is detected at a level exceeding 0.0005 milligram per liter in any sample, then:
 - (a) The public water system shall monitor quarterly at each sampling point which resulted in a detection. If a public water system is monitoring annually or less frequently for a previously detected contaminant, then the public water system does not have to return to quarterly monitoring for that contaminant unless the sample result exceeds eighty per cent of the MCL.
 - (b) The director may decrease the quarterly monitoring requirement specified in paragraph (A)(6)(a) of this rule to annual monitoring provided the director has determined that the public water system does not exceed eighty per cent of the MCL for that contaminant. In no case shall the director make this determination unless a groundwater system has monitored with a minimum of two consecutive quarterly samples and a surface water system has monitored with a minimum of four consecutive quarterly samples.
 - (c) Public water systems which monitor annually for a previously detected contaminant shall monitor during the quarter(s) which previously yielded the highest analytical result.

- (7) The director may require a confirmation sample for positive or negative results. If a confirmation sample is required by the director, the result shall be averaged with the first sampling result and the average used for the compliance determination as specified by paragraph (A)(8) of this rule.
- (8) Compliance with paragraph (D) of rule 3745-81-12 of the Administrative Code shall be determined based on the analytical results obtained at each sampling point.
 - (a) For public water systems which are conducting monitoring at a frequency greater than annually, compliance is determined by a running annual average of all samples taken at each sampling point. If the running annual average of any sampling point is greater than the MCL, then the public water system is out of compliance. The system will not be considered in violation of the MCL until it has completed one year of quarterly sampling. If, however, the initial sample or a subsequent sample would cause the running annual average to exceed the MCL, then the public water system is out of compliance immediately. Any samples below the detection limit shall be counted as zero for purposes of determining the running annual average.
 - (b) For public water systems monitoring annually or less frequently, when the average of a result and a required confirmation sample exceeds eighty per cent of the MCL, the public water system shall begin quarterly monitoring at that sample point. If a confirmation sample was not collected, the public water system shall begin quarterly monitoring if the level of the initial sample exceeds eighty per cent of the MCL. Compliance with a MCL will be determined by a running annual average as stated in paragraph (A)(8)(a) of this rule. If one sampling point is in violation of the MCL, the system is in violation of the MCL.
 - (c) If a public water system fails to collect the required number of samples, compliance will be based on the total number of samples collected.
- (9) Analysis for the contaminants listed in paragraph (D) of rule 3745-81-12 of the Administrative Code shall be conducted using the methods in rule 3745-81-27 of the Administrative Code.
- (10) Analysis under this rule shall only be conducted by laboratories that are approved under Chapter 3745-89 of the Administrative Code.

- (11) The director has discretion to delete results of obvious sampling or analytical errors.
 - (12) The director may increase required monitoring where necessary to detect variations within the public water system.
 - (13) Each approved laboratory shall determine the method detection limit (MDL), as defined in the appendix to rule 3745-89-03 of the Administrative Code, at which it is capable of detecting volatile organic chemicals. The acceptable MDL is 0.0005 milligram per liter. This concentration is the detection concentration for purposes of this rule.
- (B) Monitoring of the organic chemical contaminants with maximum contaminant levels listed in paragraph (E) of rule 3745-81-12 of the Administrative Code shall be conducted by community public water systems and nontransient noncommunity public water systems as described below.
- (1) Groundwater systems and surface water systems shall monitor with a minimum of one sample at each sampling point each time monitoring is required in paragraph (B) of this rule. After the initial set of samples, each sample shall be taken at the same sampling point as used before unless conditions make another sampling point more representative of a source or treatment plant.
 - (2) If the public water system draws water from more than one source and the sources are combined before distribution, the public water system shall monitor at each sampling point during periods of normal operating conditions and shall keep a record of and report the sources providing water for each sample. When a sample does not contain water from all the sources which serve the sampling point, a schedule prepared by the public water system shall be followed so that the next monitoring sample at this sampling point for the same organic chemical(s) will include water from sources not included in the previous sample or samples. Thus, successive samples from the same sampling point for the same organic chemical(s) shall sample water supplied from different sources until all the sources supplying that sampling point have been monitored.
 - (3) Monitoring frequency:
 - (a) Each community public water system and nontransient noncommunity public water system shall monitor with four consecutive quarterly samples at each sampling point for each

organic chemical contaminant listed in paragraph (E) of rule 3745-81-12 of the Administrative Code during each compliance period.

- (b) Public water systems serving more than three thousand three hundred persons which do not detect a contaminant listed in paragraph (E) of rule 3745-81-12 of the Administrative Code in their first compliance period may reduce the sampling frequency to a minimum of two quarterly samples in one year during each following compliance period.
 - (c) Public water systems serving fewer than three thousand three hundred one persons which do not detect a contaminant listed in paragraph (E) of rule 3745-81-12 of the Administrative Code in their first compliance period may reduce the sampling frequency to a minimum of one sample during each following compliance period.
 - (d) Public water systems that use a new source of water and new public water systems shall begin initial quarterly monitoring for each contaminant listed in paragraph (E) of rule 3745-81-12 of the Administrative Code in a quarter designated by the director during the next calendar year after operation of the new source or system begins. New public water systems shall sample at each sampling point. Public water systems with a new source of water shall sample at the sampling point related to the new source.
- (4) The director may grant a waiver from one or more requirements of paragraphs (B)(3)(a) to (B)(3)(c) of this rule. Each waiver is valid for only one compliance period.
- (5) The director may grant a waiver after evaluating the previous use (including transport, storage, or disposal) of a contaminant listed in paragraph (E) of rule 3745-81-12 of the Administrative Code within the watershed or zone of influence of the public water system. If a determination by the director reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted. If the contaminant has been used previously or if its previous use is unknown, then the following factors shall be used to determine whether a waiver is granted.
- (a) Previous analytical results.

- (b) The proximity of the public water system to a potential point or nonpoint source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Nonpoint sources include the use of pesticides to control insect and weed pests on agricultural areas, forest lands, homes and gardens, and other land application uses.
 - (c) The environmental persistence and transport of the organic chemicals listed in paragraph (E) of rule 3745-81-12 of the Administrative Code.
 - (d) How completely the water source is protected against contamination due to such factors as the depth of the well, the type of soil, and the integrity of the well casing.
 - (e) Elevated nitrate levels at the public water system source.
 - (f) Use of polychlorinated biphenyls in equipment used in the production, storage, or distribution of water (e.g., polychlorinated biphenyls used in pumps, transformers, etc.).
- (6) If an organic chemical contaminant listed in paragraph (E) of rule 3745-81-12 of the Administrative Code is detected (as defined by paragraph (B)(14) of this rule) in any sample, then:
- (a) Each public water system shall monitor quarterly at each sampling point which resulted in a detection. If a public water system is monitoring annually or less frequently for a previously detected contaminant, then the public water system does not have to return to quarterly monitoring unless the sample result exceeds eighty per cent of the MCL.
 - (b) The director may decrease the quarterly monitoring requirement specified in paragraph (B)(6)(a) of this rule to annual monitoring provided the director has determined that the public water system does not exceed eighty per cent of the MCL. In no case shall the director make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

- (c) Public water systems which monitor annually shall monitor during the quarter that previously yielded the highest analytical result.
 - (d) For public water systems which have three consecutive annual samples with no detection of a contaminant listed in paragraph (E) of rule 3745-81-12 of the Administrative Code, the director may grant a waiver as specified in paragraph (B)(4) of this rule.
 - (e) If monitoring results in detection of one or more of certain related contaminants (heptachlor, heptachlor epoxide), then subsequent monitoring shall analyze for all related contaminants.
- (7) The director may require a confirmation sample for positive or negative results. If a confirmation sample is required by the director, the result shall be averaged with the first monitoring result and the average used for the compliance determination as specified by paragraph (B)(8) of this rule.
- (8) Compliance with paragraph (E) of rule 3745-81-12 of the Administrative Code shall be determined based on the analytical results obtained at each sampling point.
- (a) For public water systems which are conducting monitoring at a frequency greater than annual, compliance is determined by a running annual average of all samples taken at each sampling point. The system will not be considered in violation of the MCL until it has completed one year of quarterly monitoring. If, however, the initial result or a subsequent result would cause the running annual average to exceed the MCL, then the public water system is out of compliance immediately. If a system fails to collect the required number of samples, compliance will be based on the total number of samples collected. If one sampling point is in violation of the MCL, the system is in violation of the MCL. Any results below the detection limit shall be calculated as zero for purposes of determining the running annual average.
 - (b) For public water systems monitoring annually or less frequently, when the average of a result and a confirmation sample exceeds eighty per cent of the MCL the public water system shall begin quarterly monitoring at that sample point. If a confirmation sample was not collected, the public water system

shall begin quarterly monitoring if the level of the initial sample exceeds eighty percent of the MCL. Compliance with the MCL will then be determined by a running annual average as stated in paragraph (B)(8)(a) of this rule.

- (9) Analysis for the organic chemical contaminants listed in paragraph (E) of rule 3745-81-12 of the Administrative Code shall be conducted by using methods set forth in rule 3745-81-27 of the Administrative Code.
- (10) Analysis for polychlorinated biphenyls shall be conducted as follows:
- (a) Each public water system which monitors for polychlorinated biphenyls shall analyze or have analyzed each sample using a technique set forth in rule 3745-81-27 of the Administrative Code.
- (b) If polychlorinated biphenyls (as one of seven aroclors) are detected (as designated in this paragraph) in any sample analyzed using a technique set forth in rule 3745-81-27 of the Administrative Code, the sample shall be reanalyzed using a technique set forth in rule 3745-81-27 of the Administrative Code to quantitate polychlorinated biphenyls (as decachlorobiphenyl).
- (c) Compliance with the MCL for polychlorinated biphenyls shall be determined based upon the quantitative results of analyses using a technique set forth in rule 3745-81-27 of the Administrative Code.

Aroclor	Detection limit (Milligrams per liter)
1016	0.00008
1221	0.02
1232	0.0005
1242	0.0003
1248	0.0001
1254	0.0001
1260	0.0002

- (11) The director has discretion to delete results of obvious sampling or analytical errors.
- (12) The director may increase the required monitoring frequency, where necessary, to detect variations within the public water system (e.g., fluctuations in concentration due to seasonal use, changes in water source).
- (13) Each public water system shall monitor at the time designated by the director within each compliance period.
- (14) Detection as used in this rule shall be defined as greater than or equal to the following concentration for each contaminant.

Contaminant	Detection limit (Milligrams per liter)
Alachlor	0.0002
Atrazine	0.0001
Benzo(A)pyrene	0.00002
Carbofuran	0.0009
Chlordane	0.0002
Dalapon	0.001
1,2-Dibromo-3-chloropropane (DBCP)	0.00002
Di(2-ethylhexyl) adipate	0.0006
Di(2-ethylhexyl) phthalate	0.0006
Dinoseb	0.0002
Diquat	0.0004
2,4-d	0.0001
Endothall	0.009
Endrin	0.00001
Ethylene dibromide (EDB)	0.00001
Glyphosate	0.006
Heptachlor	0.00004
Heptachlor epoxide	0.00002

Hexachlorobenzene	0.0001
Hexachlorocyclopentadiene	0.0001
Lindane	0.00002
Methoxychlor	0.0001
Oxamyl	0.002
Pentachlorophenol	0.00004
Picloram	0.0001
Pentachlorophenol	0.00004
Polychlorinated biphenyls (PCBs) (As decachlorobiphenyl)	0.0001
Simazine	0.00007
Toxaphene	0.001
2,3,7,8-TCDD (dioxin)	0.000000005
2,4,5-TP (silvex)	0.0002

- (C) Monitoring for total trihalomethanes (TTHM) and haloacetic acids five (HAA5).
- (1) Community public water systems and nontransient noncommunity public water systems that treat their water with any combination of primary or residual disinfectant, other than ultraviolet light, or delivers water that has been treated with any combination of primary or residual disinfectant, other than ultraviolet light, shall monitor for TTHM and HAA5 according to this rule. Beginning on the applicable compliance date identified in paragraph (D)(1) of this rule, community public water systems and nontransient noncommunity public water systems will no longer have to comply with paragraph (C) of this rule and shall comply with paragraph (D) of this rule.
 - (2) Each public water system required to monitor for TTHMs and HAA5 shall develop and implement a sample monitoring plan. The public water system shall maintain the plan and make it available for inspection by the director and the general public. All surface water systems serving more than three thousand three hundred people shall submit a copy of the monitoring plan to the director no later than the date of the first report required by paragraph (G) of rule 3745-81-75 of the Administrative Code. The director may also require the plan to be submitted by any other public water system. The public water system shall modify the plan as required by the director. The plan must

include at least the specific locations and schedules for collecting samples for TTHMs and HAA5. The director will determine compliance with MCLs for TTHMs and HAA5. If approved for monitoring as a consecutive public water system, or if providing water to a consecutive public water system, under the provisions of rule 3745-81-29 of the Administrative Code the sampling plan shall reflect the entire distribution system. Failure to monitor according to the monitoring plan is a monitoring violation.

- (3) Public water systems shall take all samples during normal operating conditions.
- (4) Routine monitoring for TTHMs and HAA5: public water systems specified in paragraph (C)(1) of this rule shall monitor at the frequency indicated in the following table:

Type of public water system	Minimum monitoring frequency	Sample location in the distribution system
Surface water system serving at least 10,000 persons.	Four water samples per quarter per treatment plant or bulk supplier.	At least twenty-five per cent of all samples collected each quarter at locations representing maximum residence time. Remaining samples taken at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods.
Surface water system serving from 500 to 9,999 persons.	One water sample per quarter per treatment plant or bulk supplier.	Location(s) representing maximum residence time.
Surface water system serving fewer than 500 persons.	One water sample per year per treatment plant or bulk supplier during the month of warmest water temperature.	Location(s) representing maximum residence time. If the sample (or average of annual samples, if more than one sample is taken) exceeds the

		MCL for either TTHM or HAA5, the public water system shall increase monitoring to one sample per treatment plant or bulk supplier per quarter, taken at a point reflecting the maximum residence time in the distribution system. Systems on increased monitoring may return to routine monitoring if, after at least one year of monitoring their TTHM running annual average is ≤ 0.060 mg/l and their HAA5 running annual average is ≤ 0.045 mg/l.
Ground water system serving at least 10,000 persons.	One water sample per quarter per treatment plant or bulk supplier.	Locations representing maximum residence time.
Ground water system serving fewer than 10,000 persons.	One sample per year per treatment plant or bulk supplier during the month of warmest water temperature.	Location(s) representing maximum residence time. If the sample (or average of annual samples, if more than one sample is taken) exceeds the MCL for either TTHM or HAA5, the public water system shall increase monitoring to one sample per treatment plant or bulk supplier per quarter, taken at a point reflecting the maximum residence time in the distribution system. Systems on increased monitoring may return to routine monitoring if, after at least one year of monitoring their TTHM running annual average is ≤ 0.060 mg/l and their HAA5 running annual average is ≤ 0.045 mg/l.

- (5) For each quarterly interval, all samples for each public water system shall be collected within a twenty-four hour period. This requirement may be waived in the event of any unforeseen, temporary or uncontrollable circumstances.

- (6) If a public water system elects to sample more frequently than the minimum required, at least twenty-five per cent of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.
- (7) Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with approval from the director. Public water systems may use the results of one sample to fulfill the monitoring requirements for more than one treatment plant, if this location is acceptable to the director.
- (8) Public water systems may use data collected under the provisions of this rule to qualify for reduced monitoring. Public water systems may use another data set to qualify for reduced monitoring, provided it has been approved by the director.
- (9) Reduced monitoring for TTHMs and HAA5: public water systems specified in paragraph (C) of this rule may reduce monitoring according to the following table:

Type of public water system	Conditions for reduced monitoring	Reduced monitoring frequency
<p>Surface water system serving at least 10,000 persons which has a source water running annual average TOC level, before any treatment, ≤ 4.0 mg/l. The running annual average must be based on the four most recent quarters of monitoring and must be ≤ 4.0 mg/l on a continuing basis at each treatment plant.</p>	<p>TTHM running annual average ≤ 0.040 mg/l and HAA5 running annual average ≤ 0.030 mg/l.</p>	<p>One sample per treatment plant or bulk supplier per quarter at distribution system locations reflecting maximum residence time.</p>

<p>Surface water system serving from 500 to 9,999 persons which has a source water running annual average TOC level, before any treatment, ≤ 4.0 mg/l. The running annual average must be based on the four most recent quarters of monitoring and must be ≤ 4.0 mg/l on a continuing basis at each treatment plant.</p>	<p>TTHM running annual average ≤ 0.040 mg/l and HAA5 running annual average ≤ 0.030 mg/l.</p>	<p>One sample per treatment plant or bulk supplier per year at distribution system locations reflecting maximum residence time during the month of warmest water temperature.</p>
<p>Ground water system serving at least 10,000 persons.</p>	<p>TTHM running annual average ≤ 0.040 mg/l and HAA5 running annual average ≤ 0.030 mg/l.</p>	<p>One sample per treatment plant or bulk supplier per year at distribution system locations reflecting maximum residence time during the month of warmest water temperature.</p>
<p>Ground water system serving fewer than 10,000 persons.</p>	<p>TTHM running annual average ≤ 0.040 mg/l and HAA5 running annual average ≤ 0.030 mg/l for two consecutive years or TTHM running annual average ≤ 0.020 mg/l and HAA5 running annual average ≤ 0.015 mg/l for one year.</p>	<p>One sample per treatment plant or bulk supplier per three year cycle at distribution system location reflecting maximum residence time during the month of warmest water temperature, with the three year cycle beginning on January 1 following the quarter in which the public water system qualifies for reduced monitoring.</p>

- (10) Public water systems on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for public water systems which must monitor quarterly) or

the result of the sample (for public water systems which must monitor no more frequently than annually) is no more than 0.060 mg/l and 0.045 mg/l for TTHMs and HAA5, respectively. Public water systems that do not meet these levels shall resume monitoring at the frequency identified in paragraph (C)(4) of this rule (minimum monitoring frequency column) in the quarter immediately following the quarter in which the public water system exceeds either 0.060 mg/l and 0.045 mg/l for TTHM and HAA5, respectively. For systems using only ground water and serving fewer than ten thousand persons, if either the TTHM running annual average is > 0.080 mg/l or the HAA5 running annual average is > 0.060 mg/l, the system shall go to the increased monitoring identified in paragraph (C)(4) of this rule (sample location in the distribution system column) in the quarter immediately following the monitoring period in which the system exceeds 0.080 mg/l or 0.060 mg/l for TTHMs or HAA5 respectively.

- (11) The director may return a public water system to routine monitoring at the director's discretion.
- (12) All samples taken and analyzed under the provisions of this rule shall be included in determining compliance with the MCLs for TTHMs and HAA5, even if that number is greater than the minimum required.
- (13) If, during the first year of monitoring under paragraph (C) of this rule, any individual quarter's average will cause the running annual average of that public water system to exceed the MCL, the public water system is out of compliance at the end of that quarter.
- (14) For public water systems monitoring quarterly, compliance with MCLs for TTHMs and HAA5 shall be based on a running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected by the public water system as prescribed by paragraph (C) of this rule. If the running annual arithmetic average of quarterly averages covering any consecutive four-quarter period exceeds the MCL, the public water system is in violation of the MCL and must notify the public according to rule 3745-81-32 of the Administrative Code, in addition to reporting to the director according to rule 3745-81-75 of the Administrative Code. Failure to perform the required monitoring is a monitoring violation. The public water system will be in violation for the entire period covered by the running annual average. If a public water system fails to complete four consecutive quarters of monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

- (15) For public water systems monitoring less frequently than quarterly, systems demonstrate MCL compliance if the average of samples taken that year according to paragraph (C) of this rule does not exceed the MCLs for TTHM and/or HAA5. If the average of these samples exceeds the MCL, the system must increase monitoring to once per quarter per treatment plant or bulk supplier. The system is not in violation of the MCL until it has completed one year of quarterly monitoring, unless the result of fewer than four quarters of monitoring will cause the running annual average to exceed the MCL, in which case the system is in violation at the end of that quarter. Systems required to increase their monitoring frequency to quarterly monitoring shall calculate compliance by including the sample which triggered the increased monitoring plus the following three quarters of monitoring.
- (D) Monitoring for total trihalomethanes (TTHM) and haloacetic acids five (HAA5).
- (1) Community public water systems and nontransient noncommunity public water systems that treat their water with any combination of primary or residual disinfectant, other than ultraviolet light, or delivers water that has been treated with any combination of primary or residual disinfectant, other than ultraviolet light, shall monitor for TTHM and HAA5 according to paragraph (D) of this rule. Public water systems which serve a population of fifty thousand or more persons shall comply beginning January 1, 2012. Public water systems which serve a population of fewer than fifty thousand persons shall comply beginning January 1, 2013. Public water systems which are part of a combined distribution system shall comply beginning at the same time as the system with the earliest compliance date in the combined distribution system. Public water systems are required to begin monitoring in the time period identified in the sample monitoring plan developed under paragraph (D)(9) of this rule. The director will determine compliance with MCLs for TTHMs and HAA5.
 - (2) For public water systems required to conduct quarterly monitoring, compliance with MCLs for TTHMs and HAA5 shall be based on a locational running annual arithmetic average at each monitoring location, calculated quarterly, at the end of the fourth calendar quarter following the compliance date and at the end of each subsequent quarter (or earlier if the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters). For public water systems monitoring quarterly, if the system fails to complete four consecutive quarters of monitoring, compliance with the MCL for the

last four quarter compliance period must be based on the average of the available data from the most recent four quarters.

- (3) If the public water system is required to conduct monitoring at a frequency that is less than quarterly, compliance with MCLs shall be based on the LRAA calculations beginning with the first compliance sample taken after the compliance date. If any sample result exceeds the MCL, the public water system must comply with the requirements of paragraphs (D)(18) to (D)(20) of this rule. If no sample exceeds the MCL, the sample result for each monitoring location is considered the LRAA for that monitoring location.
- (4) If a public water system takes more than one sample per quarter at a monitoring location, the average of all samples taken in the quarter at that location must be used to determine a quarterly average to be used in the LRAA calculation.
- (5) If the public water system fails to monitor according to the sample monitoring plan, the system will be in violation for the entire period covered by the locational running annual average. Public water systems shall take all samples during normal operating conditions.
- (6) Routine monitoring for TTHMs and HAA5: Public water systems are required to begin monitoring at the locations and the time period identified in the sample monitoring plan developed under paragraph (D)(9) of this rule. Public water systems specified in paragraph (D)(1) of this rule shall monitor at the frequency indicated and at no fewer than the number of locations identified in the following table:

Source water type	Population size category	Monitoring frequency ¹	Sample Type ²	Distribution system monitoring location total per monitoring period ²
Surface Water	<500	Per year	Individual samples	2
	500-3,300	Every 90 days	Individual samples	2
	3,301-9,999	Every 90 days	Dual sample set	2

	10,000-49,999	Every days	90	Dual sample set	4
	50,000-249,999	Every days	90	Dual sample set	8
	250,000-999,999	Every days	90	Dual sample set	12
	1,000,000-4,999,999	Every days	90	Dual sample set	16
	≥5,000,000	Every days	90	Dual sample set	20
Ground Water	<500	Per year		Individual samples	2
	500-9,999	Per year		Dual sample set	2
	10,000-99,999	Every days	90	Dual sample set	4
	100,000-499,999	Every days	90	Dual sample set	6
	≥500,000	Every days	90	Dual sample set	8

¹All systems must monitor during month of highest DBP concentrations.

²Systems on quarterly monitoring must take dual sample sets every 90 days at each monitoring location except for surface water systems serving 500-3,300. 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 surface water 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. 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.

- (7) Systems on quarterly monitoring are required to monitor every ninety days. The ninety day monitoring frequency may be extended or

reduced by five days to allow for unplanned circumstances that prevent monitoring precisely ninety days apart, as long as the samples are collected during each calendar quarter.

- (8) If a system that does not disinfect begins using a disinfectant other than UV light after the dates in paragraph (A)(1) of rule 3745-81-22 of the Administrative Code, the system must consult with the director to identify compliance monitoring locations and develop a monitoring plan under paragraph (D)(9) of this rule that includes those monitoring locations.
- (9) Each public water system required to monitor for TTHM and HAA5 shall develop and implement a sample monitoring plan. The public water system shall maintain the plan and make it available for inspection by the director and the general public. The monitoring plan must contain the following elements and be complete no later than three months prior to the year the public water system is required to begin monitoring under paragraph (D) of this rule: monitoring locations (including both a location address and sample monitoring point code); monitoring dates; and alternate monitoring locations (in the event access to a primary location is not available). The director will determine compliance with MCLs for TTHMs and HAA5.
- (10) If public water systems were not required to submit an IDSE report under either paragraph (B) or (C) of rule 3745-81-22 of the Administrative Code, and do not have sufficient monitoring locations as found in paragraph (C) of this rule to identify the required number of compliance monitoring locations as specified in paragraph (D) of this rule as indicated in paragraph (F)(2) of rule 3745-81-22 of the Administrative Code, systems must identify additional locations in the sample monitoring plan. Additional monitoring locations must be chosen by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of compliance monitoring locations have been identified. Public water systems must also provide the rationale for identifying the locations as having high levels of TTHM or HAA5. If a public water system has more monitoring locations than required for compliance monitoring according to paragraph (D) of this rule, systems must identify which locations will be used for compliance monitoring by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of compliance monitoring locations have been identified.
- (11) All surface water systems must submit a copy of the monitoring plan to the director by no later than three months prior to the year the public

water system is required to begin monitoring under paragraph (D) of this rule. The director may require new community and non-transient non-community water systems that treat their water with any combination of primary or residual disinfectant, other than ultraviolet light, or deliver water that has been treated with any combination of primary or residual disinfectant, other than ultraviolet light and become active after the applicable compliance date identified in paragraph (D)(1) of this rule to develop and submit a sample monitoring plan within twelve months of becoming active.

- (12) A public water system may revise the monitoring plan to reflect changes in treatment, distribution system operations and layout (including new service areas), or other factors that may affect TTHM or HAA5 formation, or for director approved reasons, after consultation with the director regarding the need for changes and the appropriateness of changes. If a system changes monitoring locations, the locations must replace existing compliance monitoring locations with the lowest LRAA with new locations that reflect the current distribution system locations with expected high TTHM or HAA5 levels. The director may also require modifications in the monitoring plan. Surface water systems must submit a copy of the modified monitoring plan to the director prior to the date required to comply with the revised monitoring plan.
- (13) Reduced monitoring for TTHMs and HAA5: Public water systems may reduce monitoring to the level specified in the following table any time the LRAA is less than or equal to 0.040 mg/L for TTHM and less than or equal to 0.030 mg/L for HAA5 at all monitoring locations. Systems may only use data collected under the provisions of paragraph (C) or (D) of this rule to qualify for reduced monitoring. In addition, the source water annual average TOC level, before any treatment, must be less than or equal to 4.0 mg/L at each treatment plant treating surface water, based on monitoring conducted under rule 3745-81-77 of the Administrative Code.

Source water type	Population size category	Monitoring frequency ¹	Distribution system monitoring location total per monitoring period
Surface Water:	<500	NA	Monitoring may not be reduced
	500-3,300	Per year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one

			at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	3,301-9,999	Per year	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement.
	10,000-49,999	Every days 90	2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs.
	50,000-249,999	Every days 90	4 dual sample sets-at the locations with the two highest TTHM and two highest HAA5 LRAAs.
	250,000-999,999	Every days 90	6 dual sample sets-at the locations with the three highest TTHM and three highest HAA5 LRAAs.
	1,000,000-4,999,999	Every days 90	8 dual sample sets-at the locations with the four highest TTHM and four highest HAA5 LRAAs.
	≥5,000,000	Every days 90	10 dual sample sets-at the locations with the five highest TTHM and five highest HAA5 LRAAs.
Ground Water	<500	Every third year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	500-9,999	Per year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1

			dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
10,000-99,999	Per year		2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement.
100,000-499,999	Every days	90	2 dual sample sets; at the locations with the highest TTHM and highest HAA5 LRAAs.
≥500,000	Every days	90	4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs.
¹ Systems on quarterly monitoring must take dual sample sets every 90 days.			

- (14) Public water systems may remain on reduced monitoring as long as the TTHM LRAA is less than or equal to 0.040 mg/L and the HAA5 LRAA is less than or equal to 0.030 mg/L at each monitoring location (for systems with quarterly reduced monitoring) or each TTHM sample is less than or equal to 0.060 mg/L and each HAA5 sample is less than or equal to 0.045 mg/L (for systems with annual or less frequent monitoring). In addition, the source water annual average TOC level, before any treatment, must be less than or equal to 4.0 mg/L at each treatment plant treating surface water, based on monitoring conducted under rule 3745-81-77 of the Administrative Code.
- (15) If the LRAA based on quarterly monitoring at any monitoring location exceeds either 0.040 mg/L for TTHM or 0.030 mg/L for HAA5 or if the annual (or less frequent) sample at any location exceeds either 0.060 mg/L for TTHM or 0.045 mg/L for HAA5, or if the source water annual average TOC level, before any treatment, greater than 4.0 mg/L at any treatment plant treating surface water, the system must resume routine monitoring under paragraph (D)(6) of this rule or begin increased monitoring if paragraph (D)(18) of this rule applies.
- (16) The director may return a public water system to routine monitoring at the director's discretion, for reasons including but not limited to: treatment change, significant distribution changes, or disinfectant changes.

- (17) Consecutive systems that do not add a disinfectant but deliver water that has been treated with a primary or residual disinfectant other than ultraviolet light, must comply with analytical, monitoring, and compliance requirements for chlorine and chloramines in rules 3745-81-27 and 3745-81-70 of the Administrative Code and report monitoring results under paragraph (G)(4) of rule 3745-81-75 of the Administrative Code.
- (18) If a public water system is required to monitor at a particular location annually or less frequently than annually under paragraph (D)(6) or (D)(13) of this rule, the system must increase monitoring to dual sample sets once per quarter (taken every ninety days) at all locations if a TTHM sample is greater than 0.080 mg/L or a HAA5 sample is greater than 0.060 mg/L at any location.
- (19) A public water system is in violation of the MCL when the LRAA exceeds the MCLs in rule 3745-81-12 of the Administrative Code, calculated based on four consecutive quarters of monitoring (or the LRAA calculated based on fewer than four quarters of data if the system fails to complete four consecutive quarters of monitoring, or if the MCL would be exceeded regardless of the monitoring results of subsequent quarters). The system is in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA if the system fails to monitor.
- (20) Public water systems may return to routine monitoring once increased monitoring has been conducted for at least four consecutive quarters and the LRAA for every monitoring location is less than or equal to 0.060 mg/L for TTHM and less than or equal to 0.045 mg/L for HAA5.
- (21) Operational evaluation levels: A public water system has exceeded the operational evaluation level at any monitoring location where the sum of the two previous quarters' TTHM results plus twice the current quarter's TTHM result, divided by four to determine an average, exceeds 0.080 mg/L, or where the sum of the two previous quarters' HAA5 results plus twice the current quarter's HAA5 result, divided by four to determine an average, exceeds 0.060 mg/L.
 - (a) If a public water system exceeds the operational evaluation level, the system must conduct an operational evaluation and submit a written report of the evaluation to the director no later than ninety days after being notified by the director of the analytical result that causes the system to exceed the operational evaluation level. The written report must be made available to the public upon request.

- (b) The public water system's operational evaluation must include an examination of system treatment and distribution operational practices, including storage tank operations, excess storage capacity, distribution system flushing, changes in sources or source water quality, and treatment changes or problems that may contribute to TTHM and HAA5 formation and what steps could be considered to minimize future exceedences.
 - (c) A public water system may request and the director may allow the system to limit the scope of the evaluation if the system is able to identify the cause of the operational evaluation level exceedance.
 - (d) A request from the system to limit the scope of the evaluation does not extend the schedule in paragraph (D)(21)(a) of this rule for submitting the written report. The director must approve this limited scope of evaluation in writing and the system must keep that approval with the completed report.
- (22) Requirements for reduced TTHM and HAA5 monitoring based on results collected prior to the applicable compliance date identified in paragraph (D)(1) of this rule: A public water system may remain on reduced monitoring for compliance with paragraph (D) of this rule only if the system qualified for a 40/30 certification under paragraph (D) of rule 3745-81-22 of the Administrative Code or received a very small system waiver under paragraph (E) of rule 3745-81-22 of the Administrative Code, plus the system must meet the reduced monitoring criteria in paragraph (D)(13) of this rule, and the system does not change or add monitoring locations from those used for compliance monitoring prior to the compliance date identified in paragraph (D)(1) of this rule. If the monitoring locations under paragraph (D) of this rule differ from the monitoring locations prior to the compliance date identified in paragraph (D)(1) of this rule, the system may not remain on reduced monitoring.
- (23) Requirements for remaining on increased TTHM and HAA5 monitoring based on results collected prior to the applicable compliance date identified in paragraph (D)(1) of this rule: If a public water system was on increased monitoring prior to the compliance date identified in paragraph (D)(1) of this rule, the system must remain on increased monitoring until it qualifies for a return to routine monitoring under paragraph (D)(20) of this rule. A public water system must conduct increased monitoring under paragraph (D) of this rule at the monitoring locations in the monitoring plan developed under paragraph (D)(9) of rule 3745-81-22 of the Administrative Code beginning on the compliance date identified in

paragraph (D)(1) of this rule and remain on increased monitoring until the system qualifies for a return to routine monitoring under paragraph (D)(20) of this rule.

Effective: 01/01/2010

R.C. 119.032 review dates: 09/18/2009 and 01/01/2015

Promulgated Under: 119.03

Statutory Authority: 6109.04

Rule Amplifies: 6109.04

Prior Effective Dates: 12/27/78, 08/24/81, 03/29/88, 05/22/89, 09/13/93, 01/01/02, 01/01/03, 08/01/05