

58.16.E(1)(b)(ii).

(i) The Department may extend the 24 hour time limit on a case by case basis if the system cannot collect the ground water source sample within 24 hours due to circumstances beyond its control. In the case of an extension, the Department must specify how much time the system has to collect the sample.

(ii) If approved by the Department, systems with more than one ground water source may meet the requirements of R.61 58.16.E(1)(b) by sampling a representative ground water source or sources. If directed by the Department, systems must submit a triggered source water monitoring plan for Department approval that identifies one or more ground water sources that are representative of each monitoring site in the system's sample siting plan under R.61 58.5.G(1) until March 31, 2016, or under R.61-58.17.D beginning April 1, 2016, and that the system intends to use for representative sampling under this paragraph.

(iii) Until, March 31, 2016, a ground water system serving 1,000 or fewer people may use a repeat sample collected from a ground water source to meet both the requirements of R.61 58.5.G(2) and to satisfy the monitoring requirements of R.61 58.16.E(1)(b) for that ground water source only if the Department approves the use of E.coli as a fecal indicator for source water monitoring under R.61-58.16.E(1). If the repeat sample collected from the ground water source is E.coli-positive, the system must comply with R.61 58.16.E(1)(c).

(iv) Beginning April 1, 2016, a ground water system serving 1,000 or fewer people may use a repeat sample collected from a ground water source to meet both the requirements of R.61-58.17 and to satisfy the monitoring requirements of R.61-58.16.E(1)(b) for that ground water source only if the Department approves the use of E. coli as a fecal indicator for source water monitoring under R.61-58.16.E(1) and approves the use of a single sample for meeting both the triggered source water monitoring requirements in R.61-58.16.E(1) and the repeat monitoring requirements in R.61-58.17.I. If the repeat sample collected from the ground water source is E. coli-positive, the system must comply with R.61-58.16.E(1)(c).

(c) Additional Requirements. If the Department does not require corrective action under R.61 58.16.F(1)(b) for a fecal indicator positive source water sample collected under R.61 58.16.E(1)(b) that is not invalidated under R.61 58.16.E(4), the system must collect five additional source water samples from the same source within 24 hours of being notified of the fecal indicator positive sample.

(d) Consecutive and wholesale systems.

(i) In addition to the other requirements of R.61 58.16.E(1), a consecutive ground water system that has a total coliform-positive sample collected under R.61 58.5.G(1) until March 31, 2016, or under R.61-58.17.E through R.61-58.17.H beginning April 1, 2016 must notify the wholesale system(s) within 24 hours of being notified of the total coliform-positive sample.

(ii) In addition to the other requirements of R.61 58.16.E(1), a wholesale ground water system must comply with R.61 58.16.E(1)(d)(ii)(A) and R.61 58.16.E(1)(d)(ii)(B).

(A) A wholesale ground water system that receives notice from a consecutive system it serves that a sample collected under R.61 58.5.G(1) until March 31, 2016, or collected under R.61-58.17.E through R.61-58.17.H beginning April 1, 2016, is total coliform-positive must, within 24 hours of being notified, collect a sample from its ground water source(s) under R.61 58.16.E(1)(b) and analyze it for a fecal indicator under R.61 58.16.E(3).

(B) If the sample collected under R.61 58.16.E(1)(d)(ii)(A) is fecal indicator positive, the wholesale ground water system must notify all consecutive systems served by that ground water source of the fecal indicator positive sample within 24 hours of being notified of the ground water source sample monitoring result and must meet the requirements of R.61 58.16.E(1)(c).

(e) Exceptions to the triggered source water monitoring requirements. A ground water system is not required to comply with the source water monitoring requirements of R.61 58.16.E(1) if either one of the following conditions exists:

(i) The Department determines, and documents in writing, that the total coliform-positive sample collected under R.61 58.5(G)(1) until March 31, 2016, or under R.61-58.17.E through R.61-58.17.H beginning April 1, 2016, is caused by a distribution system deficiency; or

(ii) The total coliform-positive sample collected under R.61 58.5(G)(1) until March 31, 2016, or under R.61-58.17.E through R.61-58.17.H beginning April 1, 2016, is collected at a location that meets Department criteria for distribution system conditions that will cause total coliform-positive samples.

(2) Assessment source water monitoring. If directed by the Department, ground water systems must conduct assessment source water monitoring that meets Department-determined requirements for such monitoring. A ground water system conducting assessment source water monitoring may use a triggered source water sample collected under R.61-58.16.E(1)(b) to meet the requirements of R.61-58.16.E(2). Department-determined assessment source water monitoring may include, but not be limited to the following:

(a) Collection of a total of 12 ground water source samples that represent each month the system provides ground water to the public.

(b) Collection of samples from each well unless the system obtains written Department approval to conduct monitoring at one or more wells within the ground water system that are representative of multiple wells used by that system and that draw water from the same hydrogeologic setting.

(c) Collection of a standard sample volume of at least 100 mL for fecal indicator analysis regardless of the fecal indicator or analytical method used.

(d) Analysis of all ground water source samples using one of the analytical methods listed in R.61-58.16.E(3) for the presence of E. coli, enterococci, or coliphage.

(e) Collection of ground water source samples at a location prior to any treatment of the ground water source unless the Department approves a sampling location after treatment.

- (f) Collection of ground water source samples at the well itself unless the system's configuration does not allow for sampling at the well itself and the Department approves an alternate sampling location that is representative of the water quality of that well.
- (3) Analytical methods.
 - (a) A ground water system subject to the source water monitoring requirements of R.61-58.16.E(1) must collect a standard sample volume of at least 100 ml for fecal indicator analysis regardless of the fecal indicator or analytical method used.
 - (b) A ground water system must analyze all ground water source samples collected under R.61-58.16.E(1) for E.coli, enterococci, or coliphage using EPA-approved methods listed in 40 CFR 141.402(c)(2) (Federal Register 11-8-2006 edition).
- (4) Invalidation of a fecal indicator positive ground water source sample.
 - (a) A ground water system may obtain Department invalidation of a fecal indicator positive ground water source sample collected under R.61-58.16.E(1) only under the conditions specified as follows:
 - (i) The system provides the Department with written notice from the laboratory that improper sample analysis occurred.
 - (ii) The Department determines and documents in writing that there is substantial evidence that a fecal indicator positive ground water source sample is not related to source water quality.
 - (b) If the Department invalidates a fecal indicator positive ground water source sample, the ground water system must collect another source water sample under R.61-58.16.E(1) within 24 hours of being notified by the Department of its invalidation decision and have it analyzed for the same fecal indicator using the analytical methods listed in 40 CFR 141.402(c)(2) (Federal Register 11-8-2006 edition). The Department may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the Department will specify how much time the system has to collect the sample.
- (5) Sampling location.
 - (a) Any ground water source sample required under R.61-58.16.E(1) must be collected at a location prior to any treatment of the groundwater source unless the Department approves a sampling location after treatment.
 - (b) If the system's configuration does not allow for sampling at the well itself, the system may collect a sample at a Department-approved location to meet the requirements under R.61-58.16.E(1) if the sample is representative of the water quality of that well.
- (6) New sources. If directed by the Department, a ground water system that places a new ground water source into service after November 30, 2009, must conduct assessment source water monitoring under R.61-58.16.E(2). If directed by the Department, the system must begin monitoring before the ground water source is used to provide water to the public.

(7) Public notification. A ground water system with a ground water source sample collected under R.61-58.16.E(1) or (2) that is fecal indicator positive and that is not invalidated under R.61-58.16.E(4), including consecutive systems served by the ground water source, must conduct public notification under R.61-58.6.E(2).

(8) Monitoring violations. Failure to meet the requirements of R.61-58.16.E(1) through (6) is a monitoring violation and requires the ground water system to provide public notification under R.61-58.6.E(4).

F. Treatment technique requirements for ground water systems.

(1) Ground water systems with significant deficiencies or source water fecal contamination.

(a) The treatment technique requirements of R.61-58.16.F must be met by ground water systems when a significant deficiency is identified or when a ground water source sample collected under R.61-58.16.E(1)(c) is fecal indicator positive.

(b) If directed by the Department, a ground water system with a ground water source sample collected under R.61-58.16.E(1)(b), R.61-58.16.E(1)(d), or R.61-58.16.E(2) that is fecal indicator positive must comply with the treatment technique requirements of R.61-58.16.F.

(c) When a significant deficiency is identified at a Subpart H public water system that uses both ground water and surface water or GWUDI, the system must comply with R.61-58.16.F except in cases where the Department determines that the significant deficiency is in a portion of the distribution system that is served solely by surface water or GWUDI.

(d) Unless the Department directs the ground water system to implement a specific corrective action, the ground water system must consult with the Department regarding the appropriate corrective action within 30 days of receiving written notice from the Department of a significant deficiency, written notice from a laboratory that a ground water source sample collected under R.61-58.16.E(1)(c) was found to be fecal indicator positive, or direction from the Department that a fecal indicator positive sample collected under R.61-58.16.E(1)(b), R.61-58.16.E(1)(d), or R.61-58.16.E(2) requires corrective action. For the purposes of R.61-58.16, significant deficiencies include, but are not limited to, defects in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the Department determines to be causing, or have the potential for causing, the introduction of contamination into the water delivered to consumers.

(e) Within 120 days, or earlier if directed by the Department, of receiving written notification from the Department of a significant deficiency, written notice from a laboratory that a ground water source sample collected under R.61-58.16.E(1)(c) was found to be fecal indicator positive, or direction from the Department that a fecal indicator positive sample collected under R.61-58.16.E(1)(b), R.61-58.16.E(1)(d), or R.61-58.16.E(2) requires corrective action, the ground water system must either:

(i) Have completed corrective action in accordance with applicable Department plan review processes or other Department guidance or direction, if any, including Department-specified interim measures; or

(ii) Be in compliance with a Department-approved corrective action plan and

schedule subject to the following conditions:

(A) Any subsequent modifications to a Department-approved corrective action plan and schedule must also be approved by the Department.

(B) If the Department specifies interim measures for the protection of public health pending Department approval of the corrective action plan and schedule or pending completion of the corrective action plan, the system must comply with these interim measures as well as with any schedule specified by the Department.

(f) Corrective action alternatives. Ground water systems that meet the conditions of R.61-58.16.F(1)(a) or (b) must implement one or more of the following corrective action alternatives:

(i) Correct all significant deficiencies.

(ii) Provide an alternate source of water.

(iii) Eliminate the source of contamination.

(iv) Provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source.

(g) Special notice to the public of significant deficiencies or source water fecal contamination.

(i) In addition to the applicable public notification requirements of R.61-58.6.E(2), a community ground water system that receives notice from the Department of a significant deficiency or notification of a fecal indicator positive ground water source sample that is not invalidated by the Department must inform the public served by the water system under R.61-58.12.C(11)(f) of the fecal indicator positive source sample or of any significant deficiency that has not been corrected. The system must continue to inform the public annually until the significant deficiency is corrected or the fecal contamination in the ground water source is determined by the Department to be corrected under R.61-58.16.F(1)(e).

(ii) In addition to the applicable public notification requirements of R.61-58.6.E(2), a non-community ground water system that receives notice from the Department of a significant deficiency must inform the public served by the water system in a manner approved by the Department of any significant deficiency that has not been corrected within 12 months of being notified by the Department, or earlier if directed by the Department. The system must continue to inform the public annually until the significant deficiency is corrected. The information must include:

(A) The nature of the significant deficiency and the date the significant deficiency was identified by the Department.

(B) The Department-approved plan and schedule for correction of the significant deficiency, including interim measures, progress to date, and any interim measures completed.

(C) For systems with a large proportion of non-English speaking consumers, as determined by the Department, information in the appropriate language(s) regarding the importance of the notice or a telephone number or address where consumers may contact the system to obtain a translated copy of the notice or assistance in the appropriate language.

(iii) If directed by the Department, a non-community water system with significant deficiencies that have been corrected must inform its customers of the significant deficiencies, how the deficiencies were corrected, and the dates of correction under R.61-58.16.F(1)(g)(ii).

(2) Compliance monitoring

(a) Existing ground water sources. A ground water system that is not required to meet the source water monitoring requirements of R.61-58.16 because it provides at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for any ground water source before December 1, 2009, must notify the Department in writing that it provides at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for the specified ground water source and begin compliance monitoring in accordance with R.61-58.16.F(2)(c) by December 1, 2009. Notification to the Department must include engineering, operational, or other information that the Department requests to evaluate the submission. If the system subsequently discontinues 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source, the system must conduct ground water source monitoring as required under R.61-58.16.E.

(b) New ground water sources. A ground water system that places a ground water source in service after November 30, 2009, that is not required to meet the source water monitoring requirements of R.61-58.16 because the system provides at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source must comply with all of the requirements of R.61-58.16.F(2)(b)(i) to (iii).

(i) The system must notify the Department in writing that it provides at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source. Notification to the Department must include engineering, operational, or other information that the Department requests to evaluate the submission.

(ii) The system must conduct compliance monitoring under R.61-58.16.F(2)(c) within 30 days of placing the source in service.

(iii) The system must conduct ground water source monitoring under R.61-58.16.E if the system subsequently discontinues 4-log treatment of viruses (using

inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source.

(c) Monitoring requirements. A ground water system subject to the requirements of R.61-58.16.F(1), R.61-58.16.F(2)(a), or R.61-58.16.F(2)(b) must monitor the effectiveness and reliability of treatment for that ground water source before or at the first customer as follows:

(i) Chemical disinfection

(A) A ground water system that serves greater than 3,300 people must continuously monitor the residual disinfectant concentration using analytical methods specified in 40 CFR 141.74(a)(2) at a location approved by the Department and must record the lowest residual disinfectant concentration each day that the water from the ground water source is served to the public. The ground water system must maintain the Department determined residual disinfectant concentration every day the ground water system serves the water from the ground water source to the public. If there is a failure in the continuous monitoring equipment, the ground water system must conduct grab sampling every four hours until the continuous monitoring equipment is returned to service. The system must resume continuous residual disinfectant monitoring within 14 days.

(B) A ground water system that serves 3,300 or fewer people must monitor the residual disinfectant concentration using analytical methods specified in 40 CFR 141.74(a)(2) at a location approved by the Department and record the residual disinfection concentration each day that the water from the ground water source is served to the public. The ground water system must maintain the Department-determined residual disinfectant concentration every day the ground water system serves water from the ground water source to the public. The ground water system must take a daily grab sample during the hour of peak flow or at another time specified by the Department. If any daily grab sample measurement falls below the Department-determined residual disinfectant concentration, the ground water system must take follow up samples every four hours until the residual disinfectant concentration is restored to the Department-determined level. Alternatively, a ground water system that serves 3,300 or fewer people may monitor continuously and meet the requirements of R.61-58.16.F.(2)(c)(i)(A).

(ii) Membrane filtration. A ground water system that uses membrane filtration to meet the requirements of R.61-58.16 must monitor the membrane filtration process in accordance with all Department-specified monitoring requirements and must operate the membrane filtration in accordance with all Department-specified compliance requirements. A ground water system that uses membrane filtration is in compliance with the requirement to achieve at least 4-log removal of viruses when the following conditions are met:

(A) The membrane has an absolute molecular weight cut-off or an alternate parameter that describes the exclusion characteristics of the membrane that can reliably achieve at least 4-log removal of viruses.

(B) The membrane process is operated in accordance with Department-specified compliance requirements.

(C) The integrity of the membrane is intact.

(iii) Alternative treatment. A ground water system that uses a Department-approved alternative treatment to meet the requirements of R.61-58.16 by providing at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer must:

(A) Monitor the alternative treatment in accordance with all Department-specified monitoring requirements.

(B) Operate the alternative treatment in accordance with all compliance requirements that the Department determines to be necessary to achieve at least 4-log treatment of viruses.

(3) A ground water system may discontinue 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source if the Department determines and documents in writing that 4-log treatment of viruses is no longer necessary for that ground water source. A system that discontinues 4-log treatment of viruses is subject to the source water monitoring and analytical methods requirements of R.61-58.16.E.

(4) Failure to meet the monitoring requirements of R.61-58.16.F(2) is a monitoring violation and requires the ground water system to provide public notification under R.61-58.6.E(4).

G. Treatment technique violations for ground water systems.

(1) A ground water system with a significant deficiency is in violation of the treatment technique requirement if, within 120 days (or earlier if directed by the Department) of receiving written notice from the Department of the significant deficiency, the system:

(a) Does not complete corrective action in accordance with any applicable Department plan review processes or other Department guidance and direction, including Department specified interim actions and measures, or

(b) Is not in compliance with a Department-approved corrective action plan and schedule.

(2) Unless the Department invalidates a fecal indicator positive ground water source sample under R.61-58.16.E(4), a ground water system is in violation of the treatment technique requirement if, within 120 days (or earlier if directed by the Department) of meeting the conditions of R.61-58.16.F(1)(a) or R.61-58.16.F(1)(b), the system:

(a) Does not complete corrective action in accordance with any applicable Department plan review processes or other Department guidance and direction, including Department-specified interim measures, or

(b) Is not in compliance with a Department-approved corrective action plan and schedule.

(3) A ground water system subject to the requirements of R.61-58.16.F(2)(c) that fails to maintain at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source is in violation of the treatment technique requirement if the failure is not corrected within four hours of determining the system is not maintaining at least 4-log treatment of viruses before or at the first customer.

(4) Ground water systems must give public notification under R.61-58.6.E(3) for the treatment technique violations specified in R.61-58.16.G(1), G(2), and G(3).

H. Reporting and recordkeeping for ground water systems.

(1) Reporting. In addition to the requirements of R.61-58.6.B, a ground water system regulated under R.61-58.16 must provide the following information to the Department:

(a) A ground water system conducting compliance monitoring under R.61-58.16.F(2) must notify the Department any time the system fails to meet any Department-specified requirements including, but not limited to, minimum residual disinfectant concentration, membrane operating criteria or membrane integrity, and alternative treatment operating criteria, if operation in accordance with the criteria or requirements is not restored within four hours. The ground water system must notify the Department as soon as possible, but in no case later than the end of the next business day.

(b) After completing any corrective action under R.61-58.16.F(1), a ground water system must notify the Department within 30 days of completion of the corrective action.

(c) If a ground water system subject to the requirements of R.61-58.16.E(1) does not conduct source water monitoring under R.61-58.16.E(1)(e)(ii), the system must provide documentation to the Department within 30 days of the total coliform positive sample that it met the Department criteria.

(2) Recordkeeping. In addition to the requirements of R.61-58.6.D, a ground water system regulated under R.61-58.16 must maintain the following information in its records:

(a) Documentation of corrective actions shall be kept for a period of not less than ten years.

(b) Documentation of notice to the public as required under R.61-58.16.F(1)(g) shall be kept for a period of not less than three years.

(c) Records of decisions under R.61-58.16.E(1)(e)(ii) and records of invalidation of fecal indicator positive ground water source samples under R.61-58.16.E(4) shall be kept for a period of not less than five years.

(d) For consecutive systems, documentation of notification to the wholesale system(s) of total coliform-positive samples that are not invalidated under R.61-58.5.G(3) until April 1, 2016, or under R.61-58.17.D beginning April 1, 2016, shall be kept for a period of not less than five years.

(e) For systems, including wholesale systems, that are required to perform compliance monitoring under R.61-58.16.F(2):

- (i) Records of the Department-specified minimum disinfectant residual shall be kept for a period of not less than ten years.
- (ii) Records of the lowest daily residual disinfectant concentration and records of the date and duration of any failure to maintain the Department-specified minimum residual disinfectant concentration for a period of more than four hours shall be kept for a period of not less than five years.
- (iii) Records of Department-specified compliance requirements for membrane filtration and of parameters specified by the Department for Department-approved alternative treatment and records of the date and duration of any failure to meet the membrane operating, membrane integrity, or alternative treatment operating requirements for more than four hours shall be kept for a period of not less than five years.

R.61-58.17 REVISED TOTAL COLIFORM RULE

A. Applicability.

The provisions of R.61-58.17 apply to all community and non-community public water systems.

B. General Requirements.

(1) General.

The provisions of R.61-58.17 include both maximum contaminant level and treatment technique requirements.

(2) Compliance date.

Systems must comply with the provisions of R.61-58.17 beginning April 1, 2016, unless otherwise specified in R.61-58.17.

(3) Violations of State Primary Drinking Water Regulations.

Failure to comply with the applicable requirements of this regulation R.61-58.17 shall constitute a violation of the State Primary Drinking Water Regulations.

C. Analytical Methods and Laboratory Certification

(1) Analytical methodology.

(a) The standard sample volume required for analysis, regardless of analytical method used, is 100 ml.

(b) Systems need only determine the presence or absence of total coliforms and E. coli; a determination of density is not required.

(c) The time from sample collection to initiation of test medium incubation may not exceed 30 hours. Systems are encouraged but not required to hold samples below 10 deg. C during transit.

(d) If water having residual chlorine (measured as free, combined, or total chlorine) is to be analyzed, sufficient sodium thiosulfate (Na₂S₂O₃) must be added to the sample bottle before sterilization to neutralize any residual chlorine in the water sample. Dechlorination procedures are addressed in Section 9060A.2 of Standard Methods for the Examination of Water and Wastewater (20th and 21st editions).

(e) Systems must conduct total coliform and E. coli analyses in accordance with one of the analytical methods in 40 CFR 141.852 or one of the alternative methods listed in Appendix A to subpart C of CFR 141.

(2) Laboratory Certification.

Systems must have all compliance samples required under R.61-58.17 analyzed by a laboratory certified by the EPA or the Department to analyze drinking water samples. The laboratory used by the system must be certified for each method (and associated contaminant(s)) used for compliance monitoring analyses under this rule.

D. General Monitoring Requirements for All Public Water Systems.

(1) Sample siting plans.

- (a) Systems must develop a written sample siting plan that identifies sampling sites and a sample collection schedule that are representative of water throughout the distribution system not later than March 31, 2016. These plans are subject to Department review and revision. Systems must collect total coliform samples according to the written sample siting plan. Monitoring required by R.61-58.17.E through R.61-58.17.I may take place at a customer's premise, dedicated sampling station, or other designated compliance sampling location. Routine and repeat sample sites and any sampling points necessary to meet the requirements of R.61-58.16 must be reflected in the sampling plan.
- (b) Systems must collect samples at regular time intervals throughout the month, except that systems that use only ground water and serve 4,900 or fewer people may collect all required samples on a single day if they are taken from different sites.
- (c) Systems must take at least the minimum number of required samples even if the system has had an E. coli MCL violation or has exceeded the coliform treatment technique triggers in R.61-58.17.J(1).
- (d) A system may conduct more compliance monitoring than is required by R.61-58.17 to investigate potential problems in the distribution system and use monitoring as a tool to assist in uncovering problems. A system may take more than the minimum number of required routine samples and must include the results in calculating whether the coliform treatment technique trigger in R.61-58.17.J(1)(a)(i) and (ii) has been exceeded only if the samples are taken in accordance with the existing sample siting plan and are representative of water throughout the distribution system.
- (e) Systems must identify repeat monitoring locations in the sample siting plan. Unless the provisions of R.61-58.17.D(1)(e)(i) or (1)(e)(ii) are met, the system must collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. If a total coliform-positive sample is at the end of the distribution system, or one service connection away from the end of the distribution system, the system must still take all required repeat samples. However, the Department may allow an alternative sampling location in lieu of the requirement to collect at least one repeat sample upstream or downstream of the original sampling site. Except as provided for in R.61-58.17.D (1)(e)(ii), systems required to conduct triggered source water monitoring under R.61-58.16.E(1) must take ground water source sample(s) in addition to repeat samples required under R.61-58.17.
- (i) Systems may propose repeat monitoring locations to the Department that the system believes to be representative of a pathway for contamination of the distribution system. A system may elect to specify either alternative fixed locations or criteria for selecting repeat sampling sites on a situational basis in a standard operating procedure (SOP) in its sample siting plan. The system must design its SOP to focus the repeat samples at locations that best verify and determine the extent of potential contamination of the distribution system area based on specific situations. The Department may modify the SOP or require alternative monitoring locations as needed.
- (ii) Ground water systems serving 1,000 or fewer people may propose repeat sampling locations to the Department that differentiate potential source water and distribution system contamination (e.g., by sampling at entry points to the distribution system). A ground water system with a single well required to

conduct triggered source water monitoring may, with written Department approval, take one of its repeat samples at the monitoring location required for triggered source water monitoring under R.61-58.16.E(1) if the system demonstrates to the Department's satisfaction that the sample siting plan remains representative of water quality in the distribution system. If approved by the Department, the system may use that sample result to meet the monitoring requirements in both R.61-58.16.E(1) and this section R.61-58.17.D.

(A) If a repeat sample taken at the monitoring location required for triggered source water monitoring is E. coli-positive, the system has violated the E. coli MCL and must also comply with R.61-58.16.E(1)(c). If a system takes more than one repeat sample at the monitoring location required for triggered source water monitoring, the system may reduce the number of additional source water samples required under R.61-58.16.E(1)(c) by the number of repeat samples taken at that location that were not E. coli-positive.

(B) If a system takes more than one repeat sample at the monitoring location required for triggered source water monitoring under R.61-58.16.E(1), and more than one repeat sample is E. coli-positive, the system has violated the E. coli MCL and must also comply with R.61-58.16.F(1)(a).

(C) If all repeat samples taken at the monitoring location required for triggered source water monitoring are E. coli-negative and a repeat sample taken at a monitoring location other than the one required for triggered source water monitoring is E. coli-positive, the system has violated the E. coli MCL, but is not required to comply with R.61-58.16.E(1)(c).

(f) The Department may review, revise, and approve, as appropriate, repeat sampling proposed by systems under R.61-58.17.D(1)(e)(i) and (ii). The system must demonstrate that the sample siting plan remains representative of the water quality in the distribution system. The Department may determine that monitoring at the entry point to the distribution system (especially for undisinfected ground water systems) is effective to differentiate between potential source water and distribution system problems.

(2) Special purpose samples.

Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, must not be used to determine whether the coliform treatment technique trigger has been exceeded. Repeat samples taken pursuant to R.61-58.17.I are not considered special purpose samples, and must be used to determine whether the coliform treatment technique trigger has been exceeded.

(3) Invalidation of total coliform samples.

A total coliform-positive sample invalidated under R.61-58.17.D(3) does not count toward meeting the minimum monitoring requirements of this R.61-58.17.

(a) The Department may invalidate a total coliform-positive sample only if the conditions of R.61-58.17.D(3)(a)(i), (ii), or (iii) are met.

(i) The laboratory establishes that improper sample analysis caused the total coliform-positive result.

(ii) The Department, on the basis of the results of repeat samples collected as required under R.61-58.17.I(1), determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem. The Department cannot invalidate a sample on the basis of repeat sample results unless all repeat sample(s) collected at the same tap as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected at a location other than the original tap are total coliform negative (e.g., the Department cannot invalidate a total coliform-positive sample on the basis of repeat samples if all the repeat samples are total coliform negative, or if the system has only one service connection).

(iii) The Department has substantial grounds to believe that a total coliform-positive result is due to a circumstance or condition that does not reflect water quality in the distribution system. In this case, the system must still collect all repeat samples required under R.61-58.17.I(1), and use them to determine whether a coliform treatment technique trigger in R.61-58.17.J has been exceeded. To invalidate a total coliform-positive sample under this paragraph, the decision and supporting rationale must be documented in writing, and approved and signed by the supervisor of the Department official who recommended the decision. The Department must make this document available to EPA and the public. The written documentation must state the specific cause of the total coliform-positive sample, and what action the system has taken, or will take, to correct this problem. The Department may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform negative.

(b) A laboratory must invalidate a total coliform sample (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g., the Multiple-Tube Fermentation Technique), produces a turbid culture in the absence of an acid reaction in the Presence-Absence (P-A) Coliform Test, or exhibits confluent growth or produces colonies too numerous to count with an analytical method using a membrane filter (e.g., Membrane Filter Technique). If a laboratory invalidates a sample because of such interference, the system must collect another sample from the same location as the original sample within 24 hours of being notified of the interference problem, and have it analyzed for the presence of total coliforms. The system must continue to re-sample within 24 hours and have the samples analyzed until it obtains a valid result. The Department may waive the 24-hour time limit on a case-by-case basis. Alternatively, the Department may implement criteria for waiving the 24-hour sampling time limit to use in lieu of case-by-case extensions.

E. Routine monitoring requirements for non-community water systems serving 1,000 or fewer people using only ground water.

(1) General.

(a) The provisions of this section apply to non-community water systems using only ground water (except ground water under the direct influence of surface water, as defined in R.61-58.B - Definitions) and serving 1,000 or fewer people.

(b) Following any total coliform-positive sample taken under the provisions of this section, systems must comply with the repeat monitoring requirements and E. coli analytical requirements in R.61-58.17.I.

(c) Once all monitoring required by this section R.61-58.17.E and R.61-58.17.I for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in R.61-58.17.J have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by R.61-58.17.J.

(d) For the purpose of determining eligibility for remaining on or qualifying for quarterly monitoring under the provisions of R.61-58.17.E(6)(d) and (7)(b), respectively, of this section R.61-58.17.E for transient non-community water systems, the Department may elect to not count monitoring violations under R.61-58.17.K(3)(a) if the missed sample is collected no later than the end of the monitoring period following the monitoring period in which the sample was missed. The system must collect the make-up sample in a different week than the routine sample for that monitoring period and should collect the sample as soon as possible during the monitoring period. The Department may not use this provision under R.61-58.17.E(8). This authority does not affect the provisions of R.61-58.17.K(3)(a) and R.61-58.17.L(1)(d).

(2) Monitoring frequency for total coliforms.

Systems must monitor each calendar quarter that the system provides water to the public, except for seasonal systems or as provided under R.61-58.17.E(3) through R.61-58.17.E(8) and R.61-58.17.E(10). Seasonal systems must meet the monitoring requirements of R.61-58.17.E(9).

(3) Transition to R.61-58.17 - Revised Total Coliform Rule.

(a) Systems, including seasonal systems, must continue to monitor according to the total coliform monitoring schedules under R.61-58.5.G(1) that were in effect on March 31, 2016, unless any of the conditions for increased monitoring in R.61-58.17.E(6) are triggered on or after April 1, 2016, or unless otherwise directed by the Department.

(b) Beginning April 1, 2016, the Department must perform a special monitoring evaluation during each sanitary survey to review the status of the system, including the distribution system, to determine whether the system is on an appropriate monitoring schedule. After the Department has performed the special monitoring evaluation during each sanitary survey, the Department may modify the system's monitoring schedule, as necessary, or it may allow the system to stay on its existing monitoring schedule, consistent with the provisions of R.61-58.17.E. The Department may not allow systems to begin less frequent monitoring under the special monitoring evaluation unless the system has already met the applicable criteria for less frequent monitoring in R.61-58.17.E. For seasonal systems on quarterly or annual monitoring, this evaluation must include review of the approved sample siting plan, which must designate the time period(s) for monitoring based on site-specific considerations (e.g., during periods of highest demand or highest vulnerability to contamination). The seasonal system must collect compliance samples during these time periods.

(4) Annual site visits.

Beginning no later than calendar year 2017, systems on annual monitoring, including seasonal systems, must have an initial and recurring annual site visit by the Department that is equivalent to a Level 2 assessment or an annual voluntary Level 2 assessment that meets the criteria in R.61-58.17.J(2) to remain on annual monitoring. The periodic required sanitary survey may be used to meet the requirement for an annual site visit for the year in which the sanitary survey was completed.

(5) Criteria for annual monitoring. Beginning April 1, 2016, the Department may reduce the monitoring frequency for a well-operated ground water system from quarterly routine monitoring to no less than annual monitoring, if the system demonstrates that it meets the criteria for reduced monitoring in R.61-58.17.E(5)(a) through (5)(c), except for a system that has been on increased monitoring under the provisions of R.61-58.17.E(6). A system on increased monitoring under R.61-58.17.E(6) must meet the provisions of R.61-58.17.E(7) to go to quarterly monitoring and must meet the provisions of R.61-58.17.E(8) to go to annual monitoring.

- (a) The system has a clean compliance history for a minimum of 12 months;
- (b) The most recent sanitary survey shows that the system is free of sanitary defects or has corrected all identified sanitary defects, has a protected water source, and meets approved construction standards; and
- (c) The Department has conducted an annual site visit within the last 12 months and the system has corrected all identified sanitary defects. The system may substitute a Level 2 assessment that meets the criteria in R.61-58.17.J(2) for the Department annual site visit.

(6) Increased Monitoring Requirements for systems on quarterly or annual monitoring.

A system on quarterly or annual monitoring that experiences any of the events identified in R.61-58.17.E(6)(a) through (6)(d) must begin monthly monitoring the month following the event. A system on annual monitoring that experiences the event identified in R.61-58.17.E(6)(e) must begin quarterly monitoring the quarter following the event. The system must continue monthly or quarterly monitoring until the requirements in R.61-58.17.E(7) for quarterly monitoring or R.61-58.17.E(8) for annual monitoring are met. A system on monthly monitoring for reasons other than those identified in R.61-58.17.E(6)(a) through (6)(d) is not considered to be on increased monitoring for the purposes of R.61-58.17.E(7) and (8).

- (a) The system triggers a Level 2 assessment or two Level 1 assessments under the provisions of R.61-58.17.J in a rolling 12-month period.
- (b) The system has an E. coli MCL violation.
- (c) The system has a coliform treatment technique violation.
- (d) The system has two monitoring violations under R.61-58.17 or one monitoring violation under R.61-58.17 and one Level 1 assessment under the provisions of R.61-58.17.J in a rolling 12-month period for a system on quarterly monitoring.
- (e) The system has one monitoring violation under R.61-58.17 for a system on annual monitoring.

(7) Requirements for returning to quarterly monitoring.

The Department may reduce the monitoring frequency for a system on monthly monitoring triggered under R.61-58.17.E(6) to quarterly monitoring if the system meets the criteria in R.61-58.17.E(7)(a) and (7)(b).

- (a) Within the last 12 months, the system must have a completed sanitary survey or a site visit by the Department or a voluntary Level 2 assessment by a party approved by the Department, be free of sanitary defects, and have a protected water source; and
- (b) The system must have a clean compliance history for a minimum of 12 months.

(8) Requirements for systems on increased monitoring to qualify for annual monitoring.

The Department may reduce the monitoring frequency for a system on increased monitoring under R.61-58.17.E(6) if the system meets the criteria in R.61-58.17.E(7) plus the criteria in R.61-58.17.E(8)(a) and (8)(b).

(a) An annual site visit by the Department and correction of all identified sanitary defects. The system may substitute a voluntary Level 2 assessment by a party approved by the Department for the Department annual site visit in any given year.

(b) The system must have in place or adopt one or more additional enhancements to the water system barriers to contamination in R.61-58.17.E(8)(b)(i) through (8)(b)(v).

(i) Cross connection control, as approved by the Department.

(ii) An operator certified by the South Carolina Department of Labor, Licensing and Regulation - Environmental Certification Board or regular visits by a circuit rider certified by an appropriate State certification program.

(iii) Continuous disinfection entering the distribution system and a residual in the distribution system in accordance with criteria specified by the Department.

(iv) Demonstration of maintenance of at least a 4-log removal or inactivation of viruses as provided for under R.61-58.16.F(2)(c).

(v) Other equivalent enhancements to water system barriers as approved by the Department.

(9) Seasonal systems.

(a) Beginning April 1, 2016, all seasonal systems must demonstrate completion of a Department-approved start-up procedure, which may include a requirement for startup sampling prior to serving water to the public.

(b) A seasonal system must monitor every month that it is in operation unless it meets the criteria in R.61-58.17.E(9)(b)(i) through (iii) to be eligible for monitoring less frequently than monthly beginning April 1, 2016, except as provided under R.61-58.17.E(3).

(i) Seasonal systems monitoring less frequently than monthly must have an approved sample siting plan that designates the time period for monitoring based on site-specific considerations (e.g., during periods of highest demand or highest vulnerability to contamination). Seasonal systems must collect compliance samples during this time period.

(ii) To be eligible for quarterly monitoring, the system must meet the criteria in R.61-58.17.E(7).

(iii) To be eligible for annual monitoring, the system must meet the criteria under R.61-58.17.E(8).

(c) The Department may exempt any seasonal system from some or all of the requirements for seasonal systems if the entire distribution system remains pressurized

during the entire period that the system is not operating, except that systems that monitor less frequently than monthly must still monitor during the vulnerable period designated by the Department.

(10) Additional routine monitoring the month following a total coliform-positive sample.

Systems collecting samples on a quarterly or annual frequency must conduct additional routine monitoring the month following one or more total coliform-positive samples (with or without a Level 1 treatment technique trigger). Systems must collect at least three routine samples during the next month, except that the Department may waive this requirement if the conditions of R.61-58.17.E(10)(a), (b), or (c) are met. Systems may either collect samples at regular time intervals throughout the month or may collect all required routine samples on a single day if samples are taken from different sites. Systems must use the results of additional routine samples in coliform treatment technique trigger calculations under R.61-58.17.J(1).

(a) The Department may waive the requirement to collect three routine samples the next month in which the system provides water to the public if the Department, or an agent approved by the Department, performs a site visit before the end of the next month in which the system provides water to the public. Although a sanitary survey need not be performed, the site visit must be sufficiently detailed to allow the Department to determine whether additional monitoring and/or any corrective action is needed. The Department cannot approve an employee of the system to perform this site visit, even if the employee is an agent approved by the Department to perform sanitary surveys.

(b) The Department may waive the requirement to collect three routine samples the next month in which the system provides water to the public if the Department has determined why the sample was total coliform-positive and has established that the system has corrected the problem or will correct the problem before the end of the next month in which the system serves water to the public. In this case, the Department must document this decision to waive the following month's additional monitoring requirement in writing, have it approved and signed by the supervisor of the Department official who recommends such a decision, and make this document available to the EPA and public. The written documentation must describe the specific cause of the total coliform-positive sample and what action the system has taken and/or will take to correct this problem.

(c) The Department may not waive the requirement to collect three additional routine samples the next month in which the system provides water to the public solely on the grounds that all repeat samples are total coliform negative. If the Department determines that the system has corrected the contamination problem before the system takes the set of repeat samples required in R.61-58.17.I, and all repeat samples were total coliform negative, the Department may waive the requirement for additional routine monitoring the next month.

F. Routine monitoring requirements for community water systems serving 1,000 or fewer people using only ground water.

(1) General.

(a) The provisions of this section apply to community water systems using only ground water (except ground water under the direct influence of surface water, as defined in R.61-58.B - Definitions) and serving 1,000 or fewer people.

(b) Following any total coliform-positive sample taken under the provisions of this section, systems must comply with the repeat monitoring requirements and E. coli analytical requirements in R.61-58.17.I.

(c) Once all monitoring required by this section and R.61-58.17.I for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in R.61-58.17.J have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by R.61-58.17.J.

(2) Monitoring frequency for total coliforms.

The monitoring frequency for total coliforms is one sample per month, except as provided for under R.61-58.17.F(3) through (6).

(3) Transition to R.61-58.17 - Revised Total Coliform Rule.

(a) All systems must continue to monitor according to the total coliform monitoring schedules under R.61-58.5.G that were in effect on March 31, 2016, unless any of the conditions in R.61-58.17.F(5) are triggered on or after April 1, 2016, or unless otherwise directed by the Department.

(b) Beginning April 1, 2016, the Department must perform a special monitoring evaluation during each sanitary survey to review the status of the system, including the distribution system, to determine whether the system is on an appropriate monitoring schedule. After the Department has performed the special monitoring evaluation during each sanitary survey, the Department may modify the system's monitoring schedule, as necessary, or it may allow the system to stay on its existing monitoring schedule, consistent with the provisions of R.61-58.17.F. The Department may not allow systems to begin less frequent monitoring under the special monitoring evaluation unless the system has already met the applicable criteria for less frequent monitoring in R.61-58.17.F.

(4) Criteria for reduced monitoring.

(a) The Department may reduce the monitoring frequency from monthly monitoring to no less than quarterly monitoring if the system is in compliance with Department-certified operator provisions and demonstrates that it meets the criteria in R.61-58.17.F(4)(a)(i) through (4)(a)(iii). A system that loses its certified operator must return to monthly monitoring the month following that loss.

(i) The system has a clean compliance history for a minimum of 12 months.

(ii) The most recent sanitary survey shows the system is free of sanitary defects (or has an approved plan and schedule to correct them and is in compliance with the plan and the schedule), has a protected water source and meets approved construction standards.

(iii) The system meets at least one of the following criteria:

(A) An annual site visit by the Department that is equivalent to a Level 2 assessment or an annual Level 2 assessment by a party approved by the Department and correction of all identified sanitary defects (or an approved plan and schedule to correct them and is in compliance with the plan and schedule).

- (B) Cross connection control, as approved by the Department.
- (C) Continuous disinfection entering the distribution system and a residual in the distribution system in accordance with criteria specified by the Department.
- (D) Demonstration of maintenance of at least a 4-log removal or inactivation of viruses as provided for under R.61-58.16.F(2)(c).
- (E) Other equivalent enhancements to water system barriers as approved by the Department.

(b) Reserved

(5) Return to routine monthly monitoring requirements.

Systems on quarterly monitoring that experience any of the events in R.61-58.17.F(5)(a) through (5)(d) must begin monthly monitoring the month following the event. The system must continue monthly monitoring until it meets the reduced monitoring requirements in R.61-58.17.F(4).

- (a) The system triggers a Level 2 assessment or triggers two Level 1 assessments in a rolling 12-month period.
- (b) The system has an E. coli MCL violation.
- (c) The system has a coliform treatment technique violation.
- (d) The system has two monitoring violations under R.61-58.17 in a rolling 12-month period.

(6) Additional routine monitoring the month following a total coliform-positive sample.

Systems collecting samples on a quarterly frequency must conduct additional routine monitoring the month following one or more total coliform-positive samples (with or without a Level 1 treatment technique trigger). Systems must collect at least three routine samples during the next month, except that the Department may waive this requirement if the conditions of R.61-58.17.F(6)(a), (b), or (c) are met. Systems may either collect samples at regular time intervals throughout the month or may collect all required routine samples on a single day if samples are taken from different sites. Systems must use the results of additional routine samples in coliform treatment technique trigger calculations.

- (a) The Department may waive the requirement to collect three routine samples the next month in which the system provides water to the public if the Department, or an agent approved by the Department, performs a site visit before the end of the next month in which the system provides water to the public. Although a sanitary survey need not be performed, the site visit must be sufficiently detailed to allow the Department to determine whether additional monitoring and/or any corrective action is needed. The Department cannot approve an employee of the system to perform this site visit, even if the employee is an agent approved by the Department to perform sanitary surveys.
- (b) The Department may waive the requirement to collect three routine samples the next month in which the system provides water to the public if the Department has determined why the sample was total coliform-positive and has established that the system has corrected the problem or will correct the problem before the end of the next month in which the system serves water to the public. In this case, the Department must

document this decision to waive the following month's additional monitoring requirement in writing, have it approved and signed by the supervisor of the Department official who recommends such a decision, and make this document available to the EPA and the public. The written documentation must describe the specific cause of the total coliform-positive sample and what action the system has taken and/or will take to correct this problem.

(c) The Department may not waive the requirement to collect three additional routine samples the next month in which the system provides water to the public solely on the grounds that all repeat samples are total coliform negative. If the Department determines that the system has corrected the contamination problem before the system takes the set of repeat samples required in R.61-58.17.I, and all repeat samples were total coliform negative, the Department may waive the requirement for additional routine monitoring the next month.

G. Routine monitoring requirements for subpart H public water systems serving 1,000 or fewer people.

(1) General.

(a) The provisions of this section apply to subpart H public water systems serving 1,000 or fewer people.

(b) Following any total coliform-positive sample taken under the provisions of R.61-58.17.G, systems must comply with the repeat monitoring requirements and E. coli analytical requirements in R.61-58.17.I.

(c) Once all monitoring required by this section and R.61-58.17.I for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in R.61-58.17.J have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by R.61-58.17.J.

(d) Seasonal systems.

(i) Beginning April 1, 2016, all seasonal systems must demonstrate completion of a Department-approved start-up procedure, which may include a requirement for start-up sampling prior to serving water to the public.

(ii) The Department may exempt any seasonal system from some or all of the requirements for seasonal systems if the entire distribution system remains pressurized during the entire period that the system is not operating.

(2) Routine monitoring frequency for total coliforms.

Subpart H systems (including consecutive systems) must monitor monthly. Systems may not reduce monitoring.

(3) Unfiltered subpart H systems.

A subpart H system that does not practice filtration in compliance with R.61-58.10 must collect at least one total coliform sample near the first service connection each day the turbidity level of the source water, measured as specified in R.61-58.10.F(2)(b), exceeds 1 NTU. When one or more turbidity measurements in any day exceed 1 NTU, the system must collect this coliform sample within 24 hours of the first exceedance, unless the Department determines that the system, for logistical reasons outside the system's control, cannot have the sample analyzed within 30 hours of collection and identifies an

alternative sample collection schedule. Sample results from this coliform monitoring must be included in determining whether the coliform treatment technique trigger in R.61-58.17.J has been exceeded.

H. Routine monitoring requirements for public water systems serving more than 1,000 people.

(1) General.

(a) The provisions of R.61-58.17.H apply to public water systems serving more than 1,000 persons.

(b) Following any total coliform-positive sample taken under the provisions of R.61-58.17.H, systems must comply with the repeat monitoring requirements and E. coli analytical requirements in R.61-58.17.I.

(c) Once all monitoring required by this section and R.61-58.17.I for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in R.61-58.17.J have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by R.61-58.17.J.

(d) Seasonal systems.

(i) Beginning April 1, 2016, all seasonal systems must demonstrate completion of a Department-approved start-up procedure, which may include a requirement for start-up sampling prior to serving water to the public.

(ii) The Department may exempt any seasonal system from some or all of the requirements for seasonal systems if the entire distribution system remains pressurized during the entire period that the system is not operating.

(2) Monitoring frequency for total coliforms.

The monitoring frequency for total coliforms is based on the population served by the system, as follows:

| MINIMUM NUMBER OF POPULATION SERVED | | MINIMUM NUMBER OF SAMPLES PER MONTH |
|--|--------------|--|
| 1,001 | to 2,500 | 2 |
| 2,501 | to 3,300 | 3 |
| 3,301 | to 4,100 | 4 |
| 4,101 | to 4,900 | 5 |
| 4,901 | to 5,800 | 6 |
| 5,801 | to 6,700 | 7 |
| 6,701 | to 7,600 | 8 |
| 7,601 | to 8,500 | 9 |
| 8,501 | to 12,900 | 10 |
| 12,901 | to 17,200 | 15 |
| 17,201 | to 21,500 | 20 |
| 21,501 | to 25,000 | 25 |
| 25,001 | to 33,000 | 30 |
| 33,001 | to 41,000 | 40 |
| 41,001 | to 50,000 | 50 |
| 50,001 | to 59,000 | 60 |
| 59,001 | to 70,000 | 70 |
| 70,001 | to 83,000 | 80 |
| 83,001 | to 96,000 | 90 |
| 96,001 | to 130,000 | 100 |
| 130,001 | to 220,000 | 120 |
| 220,001 | to 320,000 | 150 |
| 320,001 | to 450,000 | 180 |
| 450,001 | to 600,000 | 210 |
| 600,001 | to 780,000 | 240 |
| 780,001 | to 970,000 | 270 |
| 970,001 | to 1,230,000 | 300 |
| 1,230,001 | to 1,520,000 | 330 |
| 1,520,001 | to 1,850,000 | 360 |
| 1,850,001 | to 2,270,000 | 390 |
| 2,270,001 | to 3,020,000 | 420 |
| 3,020,001 | to 3,960,000 | 450 |
| 3,960,001 | or more | 480 |

(3) Unfiltered subpart H systems.

A subpart H system that does not practice filtration in compliance with R.61-58.10 must collect at least one total coliform sample near the first service connection each day the turbidity level of the source water, measured as specified in R.61-58.10.F(2)(b), exceeds 1 NTU. When one or more turbidity measurements in any day exceed 1 NTU, the system must collect this coliform sample within 24 hours of the first exceedance, unless the Department determines that the system, for logistical reasons outside the system's control, cannot have the sample analyzed within 30 hours of collection and identifies an alternative sample collection schedule. Sample results from this coliform monitoring must be included in determining whether the coliform treatment technique trigger in R.61-58.17.J has been exceeded.

(4) Reduced monitoring.

Systems may not reduce monitoring, except for non-community water systems using only ground water (and not ground water under the direct influence of surface water) serving 1,000 or fewer people in some months and more than 1,000 persons in other months. In months when more than 1,000 persons are served, the systems must monitor at the frequency specified in paragraph R.61-58.17.H(2). In months when 1,000 or fewer people are served, the Department may reduce the monitoring frequency, in writing, to a frequency allowed under R.61-58.17.E for a similarly situated system that always serves 1,000 or fewer people, taking into account the provisions in R.61-58.17.E(5) through (7).

I. Repeat monitoring and E. coli requirements.

(1) Repeat monitoring.

(a) If a sample taken under R.61-58.17.E though R.61-58.17.H is total coliform-positive, the system must collect a set of repeat samples within 24 hours of being notified of the positive result. The system must collect no fewer than three repeat samples for each total coliform-positive sample found. The Department may extend the 24-hour limit on a case-by-case basis if the system has a logistical problem in collecting the repeat samples within 24 hours that is beyond its control. Alternatively, the Department may implement criteria for the system to use in lieu of case-by-case extensions. In the case of an extension, the Department must specify how much time the system has to collect the repeat samples. The Department cannot waive the requirement for a system to collect repeat samples in R.61-58.17.I(1)(a) through (1)(c).

(b) The system must collect all repeat samples on the same day, except that the Department may allow a system with a single service connection to collect the required set of repeat samples over a three-day period or to collect a larger volume repeat sample(s) in one or more sample containers of any size, as long as the total volume collected is at least 300 ml.

(c) The system must collect an additional set of repeat samples in the manner specified in R.61-58.17.I(1)(a) through (1)(c) if one or more repeat samples in the current set of repeat samples is total coliform-positive. The system must collect the additional set of repeat samples within 24 hours of being notified of the positive result, unless the Department extends the limit as provided in R.61-58.17.I(1)(a). The system must continue to collect additional sets of repeat samples until either total coliforms are not detected in one complete set of repeat samples or the system determines that a coliform treatment technique trigger specified in R.61-58.17.J(1) has been exceeded as a result of a repeat sample being total coliform-positive and notifies the Department. If a trigger identified in R.61-58.17.J is exceeded as a result of a routine sample being total coliform-positive, systems are required to conduct only one round of repeat monitoring for each total coliform-positive routine sample.

(d) After a system collects a routine sample and before it learns the results of the analysis of that sample, if it collects another routine sample(s) from within five adjacent service connections of the initial sample, and the initial sample, after analysis, is found to contain total coliforms, then the system may count the subsequent sample(s) as a repeat sample instead of as a routine sample.

(e) Results of all routine and repeat samples taken under R.61-58.17.E through R.61-58.17.I not invalidated by the Department must be used to determine whether a coliform treatment technique trigger specified in R.61-58.17.J has been exceeded.

(2) Escherichia coli (E. coli) testing.

(a) If any routine or repeat sample is total coliform-positive, the system must analyze that total coliform-positive culture medium to determine if E. coli are present. If E. coli are present, the system must notify the Department by the end of the day when the system is notified of the test result, unless the system is notified of the result after the Department office is closed and the Department does not have either an after-hours phone line or an alternative notification procedure, in which case the system must notify the Department before the end of the next business day.

(b) The Department has the discretion to allow a system, on a case-by-case basis, to forgo E. coli testing on a total coliform-positive sample if that system assumes that the total coliform-positive sample is E. coli-positive. Accordingly, the system must notify the Department as specified in R.61-58.17.I(2)(a) and the provisions of R.61-58.5.F(3) apply.

J. Coliform treatment technique triggers and assessment requirements for protection against potential fecal contamination.

(1) Treatment technique triggers.

Systems must conduct assessments in accordance with R.61-58.17.J(2) of this section after exceeding treatment technique triggers in R.61-58.17.J(1)(a) and (1)(b).

(a) Level 1 treatment technique triggers.

(i) For systems taking 40 or more samples per month, the system exceeds 5.0% total coliform-positive samples for the month.

(ii) For systems taking fewer than 40 samples per month, the system has two or more total coliform-positive samples in the same month.

(iii) The system fails to take every required repeat sample after any single total coliform-positive sample.

(b) Level 2 treatment technique triggers.

(i) An E. coli MCL violation, as specified in R.61-58.17.K(1).

(ii) A second Level 1 trigger as defined in R.61-58.17.J(1)(a), within a rolling 12-month period, unless the Department has determined a likely reason that the samples that caused the first Level 1 treatment technique trigger were total coliform-positive and has established that the system has corrected the problem.

(iii) For systems with approved annual monitoring, a Level 1 trigger in two consecutive years.

(2) Requirements for assessments.

(a) Systems must ensure that Level 1 and 2 assessments are conducted in order to identify the possible presence of sanitary defects and defects in distribution system coliform monitoring practices. Level 2 assessments must be conducted by parties approved by the Department.

(b) When conducting assessments, systems must ensure that the assessor evaluates minimum elements that include review and identification of inadequacies in sample sites; sampling protocol; sample processing; atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., small ground water systems); and existing water quality monitoring data. The system must conduct the assessment consistent with any Department directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system.

(c) Level 1 Assessments.

A system must conduct a Level 1 assessment consistent with Department requirements if the system exceeds one of the treatment technique triggers in R.61-58.17.J(1)(a).

(i) The system must complete a Level 1 assessment as soon as practical after any trigger in R.61-58.17.J(1)(a). In the completed assessment form, the system must describe sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed. The assessment form may also note that no sanitary defects were identified. The system must submit the completed Level 1 assessment form to the Department within 30 days after the system learns that it has exceeded a trigger.

(ii) If the Department reviews the completed Level 1 assessment and determines that the assessment is not sufficient (including any proposed timetable for any corrective actions not already completed), the Department must consult with the system. If the Department requires revisions after consultation, the system must submit a revised assessment form to the Department on an agreed-upon schedule not to exceed 30 days from the date of the consultation.

(iii) Upon completion and submission of the assessment form by the system, the Department must determine if the system has identified a likely cause for the Level 1 trigger and, if so, establish that the system has corrected the problem, or has included a schedule acceptable to the Department for correcting the problem.

(d) Level 2 Assessments.

A system must ensure that a Level 2 assessment consistent with Department requirements is conducted if the system exceeds one of the treatment technique triggers in R.61-58.17.J(1)(b). The system must comply with any expedited actions or additional actions required by the Department in the case of an E. coli MCL violation.

(i) The system must ensure that a Level 2 assessment is completed by the Department or by a party approved by the Department as soon as practical after any trigger in R.61-58.17.J(1)(b). The system must submit a completed Level 2 assessment form to the Department within 30 days after the system learns that it has exceeded a trigger. The assessment form must describe sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed. The assessment form may also note that no sanitary defects were identified.

(ii) The system may conduct Level 2 assessments if the system has staff or management with the certification or qualifications specified by the Department unless otherwise directed by the Department.

(iii) If the Department reviews the completed Level 2 assessment and determines that the assessment is not sufficient (including any proposed timetable for any corrective actions not already completed), the Department must consult with the system. If the Department requires revisions after consultation, the system must submit a revised assessment form to the Department on an agreed-upon schedule not to exceed 30 days.

(iv) Upon completion and submission of the assessment form by the system, the Department must determine if the system has identified a likely cause for the Level 2 trigger and determine whether the system has corrected the problem, or has included a schedule acceptable to the Department for correcting the problem.

(3) Corrective Action.

Systems must correct sanitary defects found through either Level 1 or 2 assessments conducted under R.61-58.17.J(2). For corrections not completed by the time of submission of the assessment form, the system must complete the corrective action(s) in compliance with a timetable approved by the Department in consultation with the system. The system must notify the Department when each scheduled corrective action is completed.

(4) Consultation.

At any time during the assessment or corrective action phase, either the water system or the Department may request a consultation with the other party to determine the appropriate actions to be taken. The system may consult with the Department on all relevant information that may impact on its ability to comply with a requirement of R.61-58.17, including the method of accomplishment, an appropriate timeframe, and other relevant information.

K. Violations

(1) E. coli MCL Violation.

A system is in violation of the MCL for E. coli when any of the conditions identified in R.61-58.17.K(1)(a) through (1)(d) occur.

(a) The system has an E. coli-positive repeat sample following a total coliform-positive routine sample.

(b) The system has a total coliform-positive repeat sample following an E. coli-positive routine sample.

(c) The system fails to take all required repeat samples following an E. coli-positive routine sample.

(d) The system fails to test for E. coli when any repeat sample tests positive for total coliform.

(2) Treatment technique violation.

(a) A treatment technique violation occurs when a system exceeds a treatment technique trigger specified in R.61-58.17.J(1) and then fails to conduct the required assessment or corrective actions within the timeframe specified in R.61-58.17.J(2) and (3).

(b) A treatment technique violation occurs when a seasonal system fails to complete a Department-approved start-up procedure prior to serving water to the public.

(3) Monitoring violations.

(a) Failure to take every required routine or additional routine sample in a compliance period is a monitoring violation.

(b) Failure to analyze for E. coli following a total coliform-positive routine sample is a monitoring violation.

(4) Reporting violations.

(a) Failure to submit a monitoring report or completed assessment form after a system properly conducts monitoring or assessment in a timely manner is a reporting violation.

(b) Failure to notify the Department following an E. coli-positive sample as required by R.61-58.17.I(2)(a) in a timely manner is a reporting violation.

(c) Failure to submit certification of completion of Department-approved start-up procedure by a seasonal system is a reporting violation.

L. Reporting and recordkeeping.

(1) Reporting.

(a) E. coli.

(i) A system must notify the Department by the end of the day when the system learns of an E. coli MCL violation, unless the system learns of the violation after the Department office is closed and the Department does not have either an after-hours phone line or an alternative notification procedure, in which case the system must notify the Department before the end of the next business day, and notify the public in accordance with R.61-58.6.

(ii) A system must notify the Department by the end of the day when the system is notified of an E. coli-positive routine sample, unless the system is notified of the result after the Department office is closed and the Department does not have either an after-hours phone line or an alternative notification procedure, in which case the system must notify the Department before the end of the next business day.

(b) A system that has violated the treatment technique for coliforms in R.61-58.17.J must report the violation to the Department no later than the end of the next business day after it learns of the violation, and notify the public in accordance with R.61-58.6.

- (c) A system required to conduct an assessment under the provisions of R.61-58.17.J must submit the assessment report within 30 days. The system must notify the Department in accordance with R.61-58.17.J(3) when each scheduled corrective action is completed for corrections not completed by the time of submission of the assessment form.
 - (d) A system that has failed to comply with a coliform monitoring requirement must report the monitoring violation to the Department within 10 days after the system discovers the violation, and notify the public in accordance with R.61-58.6.
 - (e) A seasonal system must certify, prior to serving water to the public, that it has complied with the Department-approved start-up procedure.
- (2) Recordkeeping.
- (a) The system must maintain any assessment form, regardless of who conducts the assessment, and documentation of corrective actions completed as a result of those assessments, or other available summary documentation of the sanitary defects and corrective actions taken under R.61-58.17.J for Department review. This record must be maintained by the system for a period not less than five years after completion of the assessment or corrective action.
 - (b) The system must maintain a record of any repeat sample taken that meets Department criteria for an extension of the 24-hour period for collecting repeat samples as provided for under R.61-58.17.I(1)(a).

APPENDIX A TO 61-58.6: Violations And Other Situations Requiring A Public Notice¹

| CONTAMINANT | MCL/MRDL/TT/VIOLATIONS ² | | MONITORING & TESTING PROCEDURE VIOLATIONS | |
|---|--------------------------------------|--|--|---|
| | TIER OF PUBLIC NOTICE REQUIRED | CITATION | TIER OF PUBLIC NOTICE REQUIRED | CITATION |
| I. <u>Violations of the State Primary Drinking Water Regulations (SPDWR):³</u> | | | | |
| A. <u>Microbiological Contaminants</u> | | | | |
| 1.a Total coliform † | 2 | 61-58.5.F(1) | 3 | 61-58.5.G(1) - (5) |
| 1.b Total coliform (TT violations resulting from failure to perform assessments or corrective actions, monitoring violations, and reporting violations) ‡ | 2 | 61-58.17.K(2)(a) | 3 | 61-58.17.K(3)(a) 61-58.17.K(4)(a) |
| 1.c Seasonal system failure to follow Department-approved start-up plan prior to serving water to the public or failure to provide certification to the Department. ‡ | 2 | 61-58.17.K(2)(b) | 3 | 61-58.17.K(4)(c) |
| 2.a Fecal coliform/E. coli † | 1 | 61-58.5.F(2) | ⁴ 1, 3 | 61-58.5.G(5) |
| 2.b <i>E.coli</i> (MCL, monitoring, and reporting violations. ‡ | 1 | 61-58.17.K(1) | 3 | 61-58.17.K(3)(b) 61-58.17.K(4)(a) 61-58.17.K(4)(b) |
| 2.c <i>E. coli</i> (TT violations resulting from failure to perform level 2 Assessments or corrective action) ‡ | 2 | 61-58.17.K(2)(a) | | |
| 3. Turbidity MCL | 2 | 61-58.10.E, H, & I | 3 | 61-58.10.F |
| 4. Turbidity MCL (average of 2 days samples greater than 5 NTU) | ⁵ 2, 1 | 61-58.10.C, E, H & I | 3 | 61-58.10.F |
| 5. Turbidity (for TT violations resulting from a single exceedance of maximum allowable turbidity level) | ⁶ 2, 1 | 61-58.10.C(i)(b) 61-58.10.C(3)(b) 61-58.10.F(2)(b), 61-58.10.E(1)(b), 61-58.10.E(2)(b), 61-58.10.E(3)(b), 61-58.10.E(4), | 3 | 61-58.10.F 61-58.10.F(3) 61-58.10.H 61-58.10(I)(7)(a) (i)-(iii) & (b) |

| | | | | |
|--|----------------|--|-------------------|--|
| 6. Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. allowable turbidity level (TT). | 2 | 61-58.10.H(4)(a)(ii), 61-58.10.H(4)(b), 61-58.10.I(6)(b) 61-58.10.B - E | | 61-58.10 |
| 7. Interim Enhanced Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. turbidity level (TT) | ⁷ 2 | 61-58.10.B - E 61-58.10.I(1)-(7) | 3 | 61-58.10.H(3), (5) 61-58.10.I(4) & (5) 61-58.10.I(7) |
| 8. Filter Backwash Recycling Rule violations | 2 | 61-58.10.J(3) | 3 | 61-58.10.J(2) & (4) |
| 9. Long Term 1 Enhanced Surface Water Treatment Rule Violations. | 2 | 61-58.10.I(1)-(7) | 3 | 61-58.10.I(4) & (5) 61-58.10.I(7) |
| 10. LT2ESWTR violations | 2 | 61-58.10.K(11) – (21) | ²² 2,3 | 61-58.10.K(2) – (6) & 61-58.10.K(9) – (10) |
| 11. Ground Water Rule Violations | 2 | 61-58.16.G | 3 | 61-58.16.E(8) 61-58.16.F(4) |

B. Inorganic Chemicals (IOCs)

| | | | | |
|-------------------------------|---|---------------------------|--------------------|--|
| 1. Antimony | 2 | 61-58.5.B(2) | 3 | 61-58.5.C(7), (9) |
| 2. Arsenic | 2 | ⁸ 61-58.5.B(2) | 3 | ⁹ 61-58.5.C(7) |
| 3. Asbestos (fibers >10µm) | 2 | 61-58.5.B(2) | 3 | 61-58.5.C(7), (8) |
| 4. Barium | 2 | 61-58.5.B(2) | 3 | 61-58.5.C(7), (9) |
| 5. Beryllium | 2 | 61-58.5.B(2) | 3 | 61-58.5.C(7), (9) |
| 6. Cadmium | 2 | 61-58.5.B(2) | 3 | 61-58.5.C(7), (9) |
| 7. Chromium (total) | 2 | 61-58.5.B(2) | 3 | 61-58.5.C(7), (9) |
| 8. Cyanide | 2 | 61-58.5.B(2) | 3 | 61-58.5.C(7), (9) |
| 9. Fluoride | 2 | 61-58.5.B(2) | 3 | 61-58.5.C(7), (9) |
| 10. Mercury (inorganic) | 2 | 61-58.5.B(2) | 3 | 61-58.5.C(7), (9) |
| 11. Nitrate | 1 | 61-58.5.B(2) | ¹⁰ 1, 3 | 61-58.5.C(7), (10) |
| 12. Nitrite | 1 | 61-58.5.B(2) | ¹⁰ 1, 3 | 61-58.5.C(12) 61-58.5.C (7), (10), 61-58.5.C(12) |
| 13. Total Nitrate and Nitrite | 1 | 61-58.5.B(2) | 3 | 61-58.5.C(7) |
| 14. Selenium | 2 | 61-58.5.B(2) | 3 | 61-58.5.C(7), (9) |
| 15. Thallium | 2 | 61-58.5.B(2) | 3 | 61-58.5.C(7), (9) |

Appendix A

C. Lead and Copper Rule (Action Level for lead is 0.015 mg/L, for copper is 1.3 mg/L)

| | | | | |
|------------------------------|---|----------------|---|----------------|
| 1. Lead and Copper Rule (TT) | 2 | 61-58.11.B - G | 3 | 61-58.11.H - K |
|------------------------------|---|----------------|---|----------------|

D. Synthetic Organic Chemicals (SOCs)

| | | | | |
|--------------------------------------|---|-----------|---|--------------|
| 1. 2,4-D | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 2. 2,4,5-TP (Silvex) | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 3. Alachlor | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 4. Atrazine | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 5. Benzo(a)pyrene (PAHs) | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 6. Carbofuran | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 7. Chlordane | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 8. Dalapon | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 9. Di (2-ethylhexyl) adipate | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 10. Di (2-ethylhexyl) phthalate | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 11. Dibromochloropropane | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 12. Dinoseb | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 13. Dioxin (2,3,7,8-TCDD) | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 14. Diquat | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 15. Endothall | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 16. Endrin | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 17. Ethylene dibromide | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 18. Glyphosate | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 19. Heptachlor | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 20. Heptachlor epoxide | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 21. Hexachlorobenzene | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 22. Hexachlorocyclo-pentadiene | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 23. Lindane | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 24. Methoxychlor | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 25. Oxamyl (Vydate) | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 26. Pentachlorophenol | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 27. Picloram | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 28. Polychlorinated biphenyls (PCBs) | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 29. Simazine | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |
| 30. Toxaphene | 2 | 61-58.5.D | 3 | 61-58.5.E(7) |

Appendix A

E. Volatile Organic Chemicals (VOCs)

| | | | | |
|--------------------------------------|---|-----------|---|-----------|
| 1. Benzene | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 2. Carbon tetrachloride | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 3. Chlorobenzene (monochlorobenzene) | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 4. o-Dichlorobenzene | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 5. p-Dichlorobenzene | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 6. 1,2-Dichloroethane | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 7. 1,1-Dichloroethylene | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 8. cis-1,2-Dichloroethylene | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 9. trans-1,2-Dichloroethylene | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 10. Dichloromethane | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 11. 1,2-Dichloropropane | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 12. Ethylbenzene | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 13. Styrene | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 14. Tetrachloroethylene | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 15. Toluene | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 16. 1,2,4-Trichlorobenzene | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 17. 1,1,1-Trichloroethane | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 18. 1,1,2-Trichloroethane | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 19. Trichloroethylene | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 20. Vinyl chloride | 2 | 61-58.5.N | 3 | 61-58.5.O |
| 21. Xylenes (total) | 2 | 61-58.5.N | 3 | 61-58.5.O |

F. Radioactive Contaminants

| | | | | |
|--------------------------------|-----------------|--------------|-----------------|-------------------------------|
| 1. Beta/photon emitters | 2 | 61-58.5.H(4) | 3 | 61-58.5.K(1), 61-58.5.I(3) |
| 2. Alpha emitters | 2 | 61-58.5.H(3) | 3 | 61-58.5.K(1), 61-58.5.I(2) |
| 3. Combined radium (226 & 228) | 2 | 61-58.5.H(2) | 3 | 61-58.5.K(1), 61-58.5.I(2) |
| 4. Uranium | ¹¹ 2 | 61-58.5.H(5) | ¹² 3 | 61-58.5.K(1), 61-58.5.I(2) |

Appendix A

G. Disinfection Byproducts (DBPs), Byproduct Precursors, Disinfectant Residuals.

Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acids (HAAs).¹³

| | | | | |
|---|-----------------|---------------------------------------|---------------------|---|
| 1. Total trihalomethanes (TTHMs) | 2 | ¹⁴ 61-58.5.L, 61-58.5.P | 3 | ¹⁴ 61-58.5.M 61-58.13.C(1), (2) 61-58.14, 61-58.15 |
| 2. Haloacetic Acids (HAA5) | 2 | 61-58.5.P | 3 | 61-58.13.C(1), (2) 61-58.14, 61-58.15 |
| 3. Bromate | 2 | 61-58.5.P | 3 | 61-58.13.C(1), (2) |
| 4. Chlorite | 2 | 61-58.5.P | 3 | 61-58.13.C(1), (2) |
| 5. Chlorine (MRDL) | 2 | 61-58.5.Q | 3 | 61-58.13.C(1), (3) |
| 6. Chloramine (MRDL) | 2 | 61-58.5.Q | 3 | 61-58.13.C(1), (3) |
| 7. Chlorine dioxide (MRDL) where any 2 consecutive daily samples at entrance to distribution system only are above MRDL | 2 | 61-58.5.Q, 61-58.13.D | 2 ¹⁵ , 3 | 61-58.13.C(1), (3), 61-58.13.C(3)(b) |
| 8. Chlorine dioxide (MRDL), where sample(s) in distribution system the next day are also above MRDL | ¹⁶ 1 | 61-58.5.Q, 61-58.13.D(3) | 1 | 61-58.13.C(1), (3), 61-58.13.D(3)(b) |
| 9. Control of DBP precursors--TOC (TT) | 2 | 61-58.13.F(1), (2) | 3 | 61-58.13.C(1), (4) |
| 10. Bench marking and disinfection profiling. | N/A | N/A | 3 | 61-58.10.G(3) 61-58.10.H(3) 61-58.10.I(4) & (5) |
| 11. Development of monitoring plan | N/A | N/A | 3 | 61-58.13.C(6) |

H. Other Treatment Techniques

| | | | | |
|-------------------------|---|------------|-----|-----|
| 1. Acrylamide (TT) | 2 | 61-58.5.AA | N/A | N/A |
| 2. Epichlorohydrin (TT) | 2 | 61-58.5.AA | N/A | N/A |

II. Unregulated Contaminant Monitoring:¹⁷

| | | | | |
|-----------------------------|-----|-----|---|--------------------|
| A. Unregulated contaminants | N/A | N/A | 3 | 61-58.5.T |
| B. Nickel | N/A | N/A | 3 | 61-58.5.C(9), (17) |

III. Public Notification for Variances and Exemptions:

| | | | | |
|---|---|-----------------------|-----|-----|
| A. Operation under a variance or exemption | 3 | ¹⁸ 61-58.9 | N/A | N/A |
| B. Violation of conditions of a variance or exemption | 2 | ¹⁹ 61-58.9 | N/A | N/A |

IV. Other Situations Requiring Public Notification:

| | | | | |
|--|-----------------------|--------------------------------------|-----|-----|
| A. Fluoride secondary maximum contaminant level (SMCL) exceedance | 3 | 61-58.5.R | N/A | N/A |
| B. Exceedance of nitrate MCL for non-community systems, as allowed by Department | 1 | 61-58.5.B(3) | N/A | N/A |
| C. Availability of unregulated contaminant monitoring data | 3 | 61-58.5.T | N/A | N/A |
| D. Waterborne disease outbreak | 1 | 61-58.B(156) 61-58.10.C(3)(b)(ii) | N/A | N/A |
| E. Other waterborne emergency ²⁰ | 1 | N/A | N/A | N/A |
| F. Source water sample positive for Ground Water Rule fecal indicators: E. coli, enterococci, or coliphage | 1 | 61-58.16.E(7) | N/A | N/A |
| G. Other situations as determined by the Department | ²¹ 1, 2, 3 | N/A | N/A | N/A |

Appendix A to R.61-58.6 - Endnotes

† Until March 31, 2016

‡ Beginning April 1, 2016

¹ Violations and other situations not listed in this table (e.g., failure to prepare Consumer Confidence Reports), do not require notice, unless otherwise determined by the Department. The Department may, at its option, also require a more stringent public notice tier (e.g., Tier 1 instead of Tier 2 or Tier 2 instead of Tier 3) for specific violations and situations listed in this Appendix, as authorized under R.61-58.6.E(2)(a) and (3)(a).

² MCL--Maximum contaminant level, MRDL--Maximum residual disinfectant level, TT--Treatment technique

³ The term Violations of State Primary Drinking Water Regulations (SPDWR) is used here to include violations of MCL, MRDL, treatment technique, monitoring, and testing procedure requirements.

⁴ Failure to test for fecal coliform or E. coli is a Tier 1 violation if testing is not done after any repeat sample tests positive for coliform. All other total coliform monitoring and testing procedure violations are Tier 3.

Appendix A

- ^{5.} Systems that violate the turbidity MCL of 5 NTU based on an average of measurements over two consecutive days must consult with the Department within 24 hours after learning of the violation. Based on this consultation, the Department may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the Department in the 24-hour period, the violation is automatically elevated to Tier 1.
- ^{6.} Systems with treatment technique violations involving a single exceedance of a maximum turbidity limit under the Surface Water Treatment Rule (SWTR) Interim Enhanced Surface Water Treatment Rule (IESWTR), or the Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) are required to consult with the Department within 24 hours after learning of the violation. Based on this consultation, the Department may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the Department in the 24-hour period, the violation is automatically elevated to Tier 1.
- ^{7.} Most of the requirements of the Interim Enhanced Surface Water Treatment Rule, R.61-58.10.B - C become effective January 1, 2002 for surface water systems and ground water systems under the direct influence of surface water serving at least 10,000 persons. However, R.61-58.10.H(3) has some requirements that become effective as early as April 16, 1999. The Surface Water Treatment Rule remains in effect for systems serving at least 10,000 persons even after 2002; the Interim Enhanced Surface Water Treatment Rule adds additional requirements and does not in many cases supersede the SWTR.
- ^{8.} The arsenic MCL citations are effective January 23, 2006. Until then the citations are R.61-58.5(B)(2).
- ^{9.} The arsenic Tier 3 violations MCL citations are effective January 23, 2006. Until then, the citations are R.61-58.C(7).
- ^{10.} Failure to take a confirmation sample within 24 hours for nitrate or nitrite after an initial sample exceeds the MCL is a Tier 1 violation. Other monitoring violations for nitrate are Tier 3.
- ^{11.} The uranium MCL, Tier 2 violation citations are effective December 8, 2003 for all community water systems.
- ^{12.} The uranium Tier 3 violation citations are effective December 8, 2000 for all community water systems.
- ^{13.} Community and non-transient non-community surface water systems and ground water systems under the direct influence of surface water serving 10,000 must comply with new DBP MCLs, disinfectant MRDLs, and related monitoring requirements beginning January 1, 2002. All other community and non-transient non-community systems must meet the MCLs and MRDLs beginning January 1, 2004. Transient non-community surface water systems and ground water systems under the direct influence of surface water serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2002. Transient non-community surface water systems and ground water systems under the direct influence of surface water serving fewer than 10,000 persons and using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2004.
- ^{14.} R.61-58.5.L, and R.61-58.13.C(1) – (2) apply until R.61-58.14 and R.61-58.15 take effect under the schedule in R.61-58.14.
- ^{15.} Failure to monitor for chlorine dioxide at the entrance to the distribution system the day after exceeding the MRDL at the entrance to the distribution system is a Tier 2 violation.
- ^{16.} If any daily sample taken at the entrance to the distribution system exceeds the MRDL for chlorine dioxide and one or more samples taken in the distribution system the next day exceed the MRDL, Tier 1 notification is required. Failure to take the required samples in the distribution system after the MRDL is exceeded at the entry point also triggers Tier 1 notification.
- ^{17.} Some water systems must monitor for certain unregulated contaminants listed in R.61-58.5.T
- ^{18.} This citation refers to the requirements of R.61-58.9 that "a schedule prescribed ...for a public water system granted a variance [or exemption] shall require compliance by the system . . ."
- ^{19.} In addition to R.61-58.9 specifies the items and schedule milestones that must be included in a variance for small systems.
- ^{20.} Other waterborne emergencies require a Tier 1 public notice under R.61-58.6.E(2)(a) for situations that do not meet the definition of a

waterborne disease outbreak given in R.61-58.B(174) but that still have the potential to have serious adverse effects on health as a result of short-term exposure. These could include outbreaks not related to treatment deficiencies, as well as situations that have the potential to cause outbreaks, such as failures or significant interruption in water treatment processes, natural disasters that disrupt the water supply or distribution system, chemical spills, or unexpected loading of possible pathogens into the source water.

²¹. The Department may place other situations in any tier they believe appropriate, based on threat to public health.

²². Failure to collect three or more samples for *Cryptosporidium* analysis is a Tier 2 violation requiring special notice as specified in R.61-58.6.E(11). All other monitoring and testing procedure violations are Tier 3.

Appendix B

Appendix B to R.61-58.6: Standard Health Effects Language for Public Notification

| Contaminant | MCLG ¹ mg/L | MCL ² mg/L | Standard health effects language for public notification |
|--|------------------------|---------------------------|---|
| State Primary Drinking Water Regulations (SPDWR): | | | |
| A. <u>Microbiological Contaminants:</u> | | | |
| 1a. Total coliform † | Zero | See footnote ³ | Coliforms are bacteria that are naturally present in the and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems. |
| 1b. Fecal coliform/E. coli ‡ | Zero | Zero | Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants young children, some of the elderly, and people with severely compromised immune systems. |
| 1c. Fecal Indicators (Ground Water Rule) | Zero | TT | Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. |
| i. E. coli | None | TT | Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. |
| ii. enterococci | None | TT | |
| iii. coliphage | | | |
| 1d. Ground Water Rule TT violations | None | TT | Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches. |
| 1e. Revised Total Coliform Rule (R.61-58.17) Coliform Assessment and/or Corrective Action Violations ‡ | N/A | TT | Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in |

1f. Revised Total Coliform Rule
(R.61-58.17) E. coli Assessment and/or
Corrective Action Violations ‡

N/A

TT



1g. E. coli ‡

Zero

In compliance unless one of the following conditions occurs:
 (1) The system has an E. coli-positive repeat sample following a total coliform-positive routine sample.
 (2) The system has a total coliform-positive repeat sample following an E. coli-positive routine sample.
 (3) The system fails to take all required repeat samples following an E. coli-positive routine sample.

water treatment or distribution. When this occurs, we are required to conduct assessments to identify problems and to correct any problems that are found. [THE SYSTEM MUST USE THE FOLLOWING APPLICABLE SENTENCES.]

We failed to conduct the required assessment.

We failed to correct all identified sanitary defects that were found during the assessment(s).

E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these waters can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We violated the standard for E. coli, indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct a detailed assessment to identify problems and to correct any problems that are found.

[THE SYSTEM MUST USE THE FOLLOWING APPLICABLE SENTENCES.]

We failed to conduct the required assessment.

We failed to correct all identified sanitary defects that were found during the assessment that we conducted.

E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems.

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|--|------|--|--|
| | | (4) The system fails to test for E. coli when any repeat sample tests positive for total coliform. | |
| 1h. Revised Total Coliform Rule (R.61-58.17) Seasonal System TT Violations ‡ | N/A | TT | When this violation includes the failure to monitor for total coliforms or E. coli prior to serving water to the public, the mandatory language found at R.61-58.6.E(5)(d)(ii) must be used. When this violation includes failure to complete other actions, the appropriate elements found in R.61-58.6.E(5)(a) to describe the violation must be used. |
| 2a. Turbidity (MCL) ⁴ | None | 1 NTU ⁵ /5 NTU | Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches. |
| 2b. Turbidity (SWTR TT) ⁶ | None | TT ⁷ | Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches. |
| 2c. Turbidity (IESWTR TT) ⁸ | None | TT | Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches. |

B. Surface Water Treatment Rule (SWTR), Interim Enhanced Surface Water Treatment Rule (IESWTR), Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) and Filter Backwash Recycling Rule (FBRR) violations:

| | | | |
|--|------|------------------|---|
| 3. <i>Giardia lamblia</i> (SWTR/IESWTR/LT1ESWTR) | Zero | TT ¹⁰ | Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches. |
| 4. Viruses (SWTR/IESWTR/LT1ESWTR) | | | |

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5. Heterotrophic plate count (HPC) bacteria⁹

(SWTR/IESWTR/LT1ESWTR).

6. *Legionella*

(SWTR/IESWTR/LT1ESWTR).

7. *Cryptosporidium*

(IESWTR/FBRR/LT1ESWTR).

C. Inorganic Chemicals (IOCs):

| | | | |
|--------------------------|---------------------|-------|--|
| 8. Antimony | 0.006 | 0.006 | Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar. |
| 9. Arsenic ¹¹ | Zero | 0.010 | Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer. |
| 10. Asbestos (10 µm) | 7 MFL ¹² | 7 MFL | Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps. |
| 11. Barium | 2 | 2 | Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure. |
| 12. Beryllium | 0.004 | 0.004 | Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions. |
| 13. Cadmium | 0.005 | 0.005 | Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage. |
| 14. Chromium (total) | 0.1 | 0.1 | Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis. |
| 15. Cyanide | 0.2 | 0.2 | Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid. |
| 16. Fluoride | 4.0 | 4.0 | Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also |

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| | | | |
|---------------------------------|--------|------------------|---|
| 17. Mercury (inorganic) | 0.002 | 0.002 | known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums. Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage. |
| 18. Nitrate | 10 | 10 | Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome. |
| 19. Nitrite | 1 | 1 | Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome. |
| 20. Total Nitrate and Nitrite | 10 | 10 | Infants below the age of six months who drink water containing nitrate and nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome. |
| 21. Selenium | 0.05 | 0.05 | Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation. |
| 22. Thallium | 0.0005 | 0.002 | Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver. |
| <hr/> | | | |
| D. <u>Lead and Copper Rule:</u> | | | |
| 23. Lead | Zero | TT ¹³ | Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure. |
| 24. Copper | 1.3 | TT ¹⁴ | Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water |

containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

E. Synthetic Organic Chemicals (SOCs):

| | | | |
|---------------------------------|-------|--------|--|
| 25. 2,4-D | 0.07 | 0.07 | Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with kidneys, liver, or adrenal glands. |
| 26. 2,4,5-TP (Silvex) | 0.05 | 0.05 | Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems. |
| 27. Alachlor | Zero | 0.002 | Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer. |
| 28. Atrazine | 0.003 | 0.003 | Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties. |
| 29. Benzo(a)pyrene (PAHs) | Zero | 0.0002 | Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer. |
| 30. Carbofuran | 0.04 | 0.04 | Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems. |
| 31. Chlordane | Zero | 0.002 | Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer. |
| 32. Dalapon | 0.2 | 0.2 | Some people who drink water containing dalapon well in excess of the MCL over many years could minor kidney changes. |
| 33. Di (2-ethylhexyl) adipate | 0.4 | 0.4 | Some people who drink water containing di(2-ethylhexyl) adipate well in excess of the MCL over many years could experience toxic effects such as weight loss, liver enlargement or possible reproductive difficulties. |
| 34. Di (2-ethylhexyl) phthalate | Zero | 0.006 | Some people who drink water containing di(2-ethylhexyl) phthalate well in excess of the MCL many years may have problems with their liver, or experience reproductive |

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| 35. Dibromochloropropane (DBCP) | Zero | 0.0002 | difficulties, and may have an increased risk of getting cancer. Some people who drink water containing DBCP in of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer. |
| 36. Dinoseb | 0.007 | 0.007 | Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties. |
| 37. Dioxin (2,3,7,8-TCDD). | Zero | 3×10^{-8} | Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer. |
| 38. Diquat | 0.02 | 0.02 | Some people who drink water containing diquat in excess of the MCL over many years could get cataracts. |
| 39. Endothall | 0.1 | 0.1 | Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines. |
| 40. Endrin | 0.002 | 0.002 | Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems. |
| 41. Ethylene dibromide | Zero | 0.00005 | Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer. |
| 42. Glyphosate | 0.7 | 0.7 | Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties. |
| 43. Heptachlor | Zero | 0.0004 | Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer. |
| 44. Heptachlor epoxide | Zero | 0.0002 | Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer. |
| 45. Hexachlorobenzene | Zero | 0.001 | Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer. |
| 46. Hexachlorocyclo pentadiene | 0.05 | 0.05 | Some people who drink water containing Hexachlorocyclo-pentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach. |
| 47. Lindane | 0.0002 | 0.0002 | Some people who drink water containing lindane in excess of the MCL over many years could experience problems with |

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|---------------------------------------|---|--------|---|
| 48. Methoxychlor | 0.04 | 0.04 | their kidneys or liver. Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties. |
| 49. Oxamyl (Vydate) | 0.2 | 0.2 | Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects. |
| 50. Pentachlorophenol | Zero | 0.001 | Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer. |
| 51. Picloram | 0.5 | 0.5 | Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver. |
| 52. Polychlorinated biphenyls (PCBs). | Zero | 0.0005 | Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer. |
| 53. Simazine | 0.004 | 0.004 | Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood. |
| 54. Toxaphene | Zero | 0.003 | Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer. |
| <hr/> | | | |
| F. | <u>Volatile Organic Chemicals (VOCs):</u> | | |
| 55. Benzene | Zero | 0.005 | Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer. |
| 56. Carbon tetrachloride | Zero | 0.005 | Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer. |
| 57. Chlorobenzene (monochlorobenzene) | 0.1 | 0.1 | Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems |

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| 58. o-Dichlorobenzene | 0.6 | 0.6 | with their liver or kidneys. Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems. |
| 59. p-Dichlorobenzene | 0.075 | 0.075 | Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood. |
| 60. 1,2-Dichloroethane | Zero | 0.005 | Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer. |
| 61. 1,1-Dichloroethylene | 0.007 | 0.007 | Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver. |
| 62. cis-1,2-Dichloroethylene | 0.07 | 0.07 | Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver. |
| 63. trans-1,2-Dichloroethylene | 0.1 | 0.1 | Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver. |
| 64. Dichloromethane | Zero | 0.005 | Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer. |
| 65. 1,2-Dichloropropane | Zero | 0.005 | Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer. |
| 66. Ethylbenzene | 0.7 | 0.7 | Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys. |
| 67. Styrene | 0.1 | 0.1 | Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system. |
| 68. Tetrachloroethylene | Zero | 0.005 | Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer. |
| 69. Toluene | 1 | 1 | Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver. |
| 70. 1,2,4-Trichlorobenzene | 0.07 | 0.07 | Some people who drink water containing 1,2,4- |

| | | | |
|-------------------------------------|-------|-------------------------|--|
| 71. 1,1,1-Trichloroethane | 0.2 | 0.2 | trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands. Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system. |
| 72. 1,1,2-Trichloroethane | 0.003 | 0.005 | Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems. |
| 73. Trichloroethylene | Zero | 0.005 | Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer. |
| 74. Vinyl chloride | Zero | 0.002 | Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer. |
| 75. Xylenes (total) | 10 | 10 | Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system. |
| G. Radioactive Contaminants: | | | |
| 76. Beta/photon emitters | Zero | 4 mrem/yr ¹⁵ | Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer. |
| 77. Alpha emitters | Zero | 15 pCi/L ¹⁶ | Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer. |
| 78. Combined radium (226 & 228) | Zero | 5 pCi/L | Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer. |
| 79. Uranium ¹⁷ | Zero | 30ig/L | Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity. |

Appendix B

H. Disinfection Byproducts (DBPs), Byproduct Precursors, and Disinfectant Residuals:

Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acids (HAAs):¹⁸

| | | | |
|---|-------------------------|---------------------------|---|
| 80. Total trihalomethanes (TTHMs) | N/A | 0.08017 ^{19, 20} | Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system and may have an increased risk of getting cancer. |
| 81. Haloacetic Acids (HAA) | N/A | 0.060 ²¹ | Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer. |
| 82. Bromate | Zero | 0.010 | Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer. |
| 83. Chlorite | 0.08 | 1.0 | Some infants and young children who drinking drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia. |
| 84. Chlorine | 4 (MRDLG) ²² | 4.0 (MRDL) ²³ | Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort. |
| 85. Chloramines | 4 (MRDLG) | 4.0 (MRDL) | Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia. |
| 86a. Chlorine dioxide, where any 2 consecutive daily samples taken at the entrance to the distribution system are above the MRDL. | 0.8 (MRDLG) | 0.8 (MRDL) | Some infants and young children who drink water containing chlorine dioxide in excess of a the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine ioxide in excess of the MRDL. Some people may experience anemia. <i>Add for public notification only:</i> The chlorine dioxide violations reported today are the result of exceedances at the treatment facility only not within the distribution system which |

| | | | |
|---|-------------|------------|---|
| 86b. Chlorine dioxide, where one or more water distribution system are above the MRDL | 0.8 (MRDLG) | 0.8 (MRDL) | <p>delivers water to consumers. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to consumers. Some infants and young children who drink containing chlorine dioxide in excess of the MRDL could experience nervous effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia.</p> <p><i>Add for public notification only:</i> The chlorine dioxide violations reported today include exceedances of the EPA standard within the distribution system which delivers water to consumers. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including fetuses, infants, and young children, may be especially susceptible to nervous system effects from excessive chlorine dioxide exposure.</p> |
| 87. Control of DBP precursors (DBP) | None | TT | <p>Total organic carbon (TOC) has no health effects However, total organic carbon provides a medium for the formation of disinfection by-products. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these by-products in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.</p> |
| I. <u>Other Treatment Techniques:</u> | | | |
| 88. Acrylamide | Zero | TT | <p>Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.</p> |
| 89. Epichlorohydrin | Zero | TT | <p>Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.</p> |

Appendix B to R.61-58.6 - endnotes

† Until March 31, 2016

‡ Beginning April 1, 2016

¹. MCLG - Maximum contaminant level goal

². MCL - Maximum contaminant level

³. For water systems analyzing at least 40 samples per month, no more than 5.0 percent of the monthly samples may be positive for total coliforms. For systems analyzing fewer than 40 samples per month, no more than one sample per month may be positive for total coliforms.

⁴. There are various regulations that set turbidity standards for different types of systems, including the 1989 Surface Water Treatment Rule, the 1998 Interim Enhanced Surface Water Treatment Rule, and the 2002 Long Term 1 Enhanced Surface Water Treatment Rule. The MCL for the monthly turbidity average is 1 NTU; the MCL for the 2-day average is 5 NTU for systems that are required to filter but have not yet installed filtration.

⁵. NTU - Nephelometric turbidity unit

⁶. There are various regulations that set turbidity standards for different types of systems, including the 1989 Surface Water Treatment Rule (SWTR), the 1998 Interim Enhanced Surface Water Treatment Rule (IESWTR), and the 2001 Long Term 1 Enhanced Surface Water Treatment Rule. Systems subject to the Surface Water Treatment Rule (both filtered and unfiltered) may not exceed 5 NTU. In addition, in filtered systems, 95 percent of samples each month must not exceed 0.5 NTU in systems using conventional or direct filtration and must not exceed 1 NTU in systems using slow sand or diatomaceous earth filtration or other filtration technologies approved by the Department.

⁷. TT - Treatment technique

⁸. There are various regulations that set turbidity standards for different types of systems, including the 1989 Surface Water Treatment Rule (SWTR), the 1998 Interim Enhanced Surface Water Treatment Rule (IESWTR), and the 2002 Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR). For systems subject to the IESWTR (systems serving at least 10,000 people, using surface water or ground water under the direct influence of surface water), that use conventional filtration or direct filtration, after January 1, 2002, the turbidity level of a system's combined filter effluent may not exceed 0.3 NTU in at least 95 percent of monthly measurements, and the turbidity level of a system's combined filter effluent must not exceed 1 NTU at any time. Systems subject to the IESWTR using technologies other than conventional, direct, slow sand, or diatomaceous earth filtration must meet turbidity limits set by the Department. For systems subject to the LT1ESWTR (systems serving fewer than 10,000 people, using surface water or ground water under the direct influence of surface water) that use conventional filtration or direct filtration, after January 1, 2005 the turbidity level of a system's combined filter effluent may not exceed 0.3 NTU in at least 95 percent of monthly measurements, and the turbidity level of a system's combined filter effluent must not exceed 1 NTU at any time. Systems subject to the LT1ESWTR using technologies other than conventional, direct, slow sand, or diatomaceous earth filtration must meet turbidity limits set by the Department.

⁹. The bacteria detected by heterotrophic plate count (HPC) are not necessarily harmful. HPC is simply an alternative method of determining disinfectant residual levels. The number of such bacteria is an indicator of whether there is enough disinfectant in the distribution system.

¹⁰. SWTR, IESWTR, and LT1ESWTR treatment technique violations that involve turbidity exceedances may use the health effects language for turbidity instead.

¹¹. These arsenic values are effective January 23, 2006. Until then, the MCL is 0.05 mg/L and there is no MCLG.

¹². Millions fibers per liter.

¹³. Action Level = 0.015 mg/L

¹⁴. Action Level = 1.3 mg/L

¹⁵. Millirems per years

¹⁶. Picocuries per liter

¹⁷ The uranium MCL is effective December 8, 2003 for all community water systems.

¹⁸. Surface water systems and ground water systems under the direct influence of surface water are regulated under R.61-58.10. Community and non-transient non-community systems serving greater than, or equal to 10,000 must comply with R.61-58.13 DBP MCLs and disinfectant maximum residual disinfectant levels (MRDLs) beginning January 1, 2002. All other community and non-transient non-community systems must comply with R-61.58.13 DBP MCLs and MRDLs beginning January 1, 2004. Transient non-community surface water systems and ground water systems under the direct influence of surface water serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2002. All other transient non-community systems that use chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning on January 1, 2004.

¹⁹. Community and non-transient non-community systems that must comply with R.61-58.14 TTHM and HAA5 MCLs of 0.080 mg/L and 0.060 mg/L, respectively (with compliance calculated as a locational running annual average) on the schedule in R.61-58.15.

²⁰. The MCL for total trihalomethanes is the sum of the concentrations of the individual trihalomethanes.

²¹. The MCL for haloacetic acids is the sum of the concentrations of the individual haloacetic acids.

²². MRDLG--Maximum residual disinfectant level goal.

²³. MRDL--Maximum residual disinfectant level.

Appendix C to R.61-58.6 List of Acronyms Used in Public Notification Regulation

CCR Consumer Confidence Report
CWS Community Water System
DBP Disinfection Byproduct
EPA Environmental Protection Agency
FBR Filter Backwash Recycle Rule
GWR Ground Water Rule
HPC Heterotrophic Plate Count
IESWTR Interim Enhanced Surface Water Treatment Rule
IOC Inorganic Chemical
LCR Lead and Copper Rule
LT1ESWTR Long Term 1 Enhanced Surface Water Treatment Rule
MCL Maximum Contaminant Level
MCLG Maximum Contaminant Level Goal
MRDL Maximum Residual Disinfectant Level
MRDLG Maximum Residual Disinfectant Level Goal
NCWS Non-Community Water System
NPDWR National Primary Drinking Water Regulation
NTNCWS Non-Transient Non-Community Water System
NTU Nephelometric Turbidity Unit
OGWDW Office of Ground Water and Drinking Water
OW Office of Water
PN Public Notification
PWS Public Water System
SDWA Safe Drinking Water Act
SMCL Secondary Maximum Contaminant Level
SOC Synthetic Organic Chemical
SPDWR State Primary Drinking Water Regulations
SWTR Surface Water Treatment Rule
TCR Total Coliform Rule
TT Treatment Technique
TWS Transient Non-Community Water System
VOC Volatile Organic Chemical

APPENDIX D TO R.61-58.12: Consumer Confidence Reports: Regulated Contaminants

| Contaminant (units) | Traditional MCL in mg/L | To convert for CCR, multiply by | MCL in CCR units | MCLG | Major sources in drinking water | Health effects language |
|--------------------------------------|--|---------------------------------|---|------|--------------------------------------|---|
| <u>Microbiological contaminants:</u> | | | | | | |
| Total Coliform Bacteria † | MCL: (systems that collect > 40 samples/month) 5% of monthly samples are positive; (systems that collect <40 samples/month) 1 positive monthly sample. | | MCL: (systems that collect ≥40 samples/month) 5% of monthly samples are positive; (systems that collect <40 samples/month) 1 positive monthly sample. | 0 | Naturally present in the environment | Coliforms are bacteria that are naturally present in the and are used as an indicator that other, potentially harmful bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems. |
| Total Coliform Bacteria ‡ | TT | | | N/A | Naturally present in the environment | Use language in R.51-58.12.C(11)(g)(i)(A) |
| Fecal coliform and E. coli † | 0 | | 0 | 0 | Human and animal fecal waste | Fecal coliforms and E. Coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely-compromised immune systems. |
| E. coli ‡ | Routine and repeat samples are total coliform-positive and either is E. coli-positive or system fails to take repeat samples | | Routine and repeat samples are total coliform-positive and either is E. coli-positive or system fails to take repeat samples | 0 | Human and animal fecal waste | E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or |

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| | following E. coli-positive routine sample or system fails to analyze total coliform-positive repeat sample for E. coli | following E. coli-positive routine sample or system fails to analyze total coliform-positive repeat sample for E. coli | | | other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely-compromised immune systems. |
| Fecal Indicators (enterococci or coliphage). | TT | TT | N/A | Human and animal fecal waste. | Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. |
| Total organic carbon (ppm) | TT | TT | N/A | Naturally present | Total organic carbon (TOC) has no health effects. However, total organic carbon in the environment provides a medium for the formation of disinfection by-products. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these by-products in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer. |
| Turbidity (NTU) | TT | TT | N/A | Soil runoff | Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches. |

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Radioactive contaminants:

| | | | | | | |
|--------------------------------|-----------|--|----|-----|---|---|
| Beta/photon emitters (mrem/yr) | 4 mrem/yr | | 4 | N/A | Decay of natural and man-made deposits. | Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon in excess of the MCL over many years may have an increased risk of getting cancer. |
| Alpha emitters (pCi/L) | 15 pCi/L | | 15 | N/A | Erosion of natural deposits. | Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer. |
| Combined radium (pCi/L) | 5 pCi/L | | 5 | N/A | Erosion of natural deposits. | Some people who drink water containing radium-226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer. |
| Uranium (pCi/L) | 30 µg/L | | 30 | 0 | Erosion of natural deposits. | Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk getting cancer and kidney toxicity. |

Inorganic contaminants:

| | | | | | | |
|----------------|--------------------|------|------------------|----------------|---|---|
| Antimony (ppb) | .006 | 1000 | 6 | 6 | Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder. | Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar. |
| Arsenic (ppb) | ¹ 0.010 | 1000 | ¹ 10. | ¹ 0 | Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes. | Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer. |

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| Asbestos (MFL) | 7 MFL | | 7 | 7 | Decay of asbestos cement water mains; production wastes; erosion of natural deposits. | Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps. |
| Barium (ppm) | 2 | | 2 | 2 | Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits. | Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure. |
| Beryllium (ppb) | .004 | 1000 | 4 | 4 | Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries | Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions |
| Bromate (ppb) | .010 | 1000 | 10 | 0 | By-product of drinking water chlorination. | Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer. |
| Cadmium (ppb) | .005 | 1000 | 5 | 5 | Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints. | Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage. |
| Chloramines (ppm) | MRDL = 4 | | MRDL = 4 | MRDLG = 4 | Water additive used to control microbes. | Some people who use water containing chloramines well in excess of the MRDL could experience irritating to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia. |

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| Chlorine (ppm) | MRDL = 4 | | MRDL = 4 | MRDLG = 4 | Water additive used to control microbes | Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort. |
| Chlorine dioxide (ppb) | MRDL = .8 | 1000 | MRDL = 800 | MRDLG = 800 | Water additive used to control microbes | Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. |
| Chlorite (ppm) | 1 | | 1 | 0.8 | By-product of drinking water chlorination. | Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia. |
| Chromium (ppb) | .1 | 1000 | 100 | 100 | Discharge from steel and pulp; mills; Erosion of Natural deposits. | Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis. |
| Copper (ppm) | AL=1.3 | | AL=1.3 | 1.3 | Corrosion of household plumbing. Erosion of natural deposits. | Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor. |

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| Cyanide (ppb) | 2 | 1000 | 200 | 200 | Discharge from steel/metal factories; Discharge from plastic and fertilizer factories. | Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid. |
| Fluoride (ppm) | 4 | | 4 | 4 | Erosion of natural deposits; Water additive which promotes strong teeth Discharge from fertilizer and aluminum factories | Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums. |
| Lead (ppb) | AL=.015 | 1000 | AL=15 | 0 | Corrosion of household plumbing systems; Erosion of natural deposits | Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure. |
| Mercury [inorganic] (ppb) | .002 | 1000 | 2 | 2 | Erosion of natural deposits;discharge from refineries and factories; Runoff from landfills; Runoff from cropland. | Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage |
| Nitrate (ppm) | 10 | | 10 | 10 | Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits. | Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome. |

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| Nitrite (ppm) | 1 | | 1 | 1 | Runoff from fertilizer use; Leaching from septic tanks sewage; Erosion of natural deposits | Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome. |
| Selenium (ppb) | .05 | 1000 | 50 | 50 | Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines. | Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation |
| Thallium (ppb) | .002 | 1000 | 2 | 0.5 | Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories. | Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver. |

Synthetic organic contaminants including pesticides and herbicides:

| | | | | | | |
|------------------------|-----|------|----|----|---|--|
| 2,4-D (ppb) | .07 | 1000 | 70 | 70 | Runoff from herbicide used on row crops. | Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands. |
| 2,4,5-TP [Silvex](ppb) | .05 | 1000 | 50 | 50 | Residue of banned herbicide | Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems. |
| Acrylamide | TT | | TT | 0 | Added to water during sewage/ wastewater treatment. | Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have risk of getting cancer. |

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| Alachlor (ppb) | .002 | 1000 | 2 | 0 | Runoff from herbicide used on row crops. | Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer. |
| Atrazine (ppb) | .003 | 1000 | 3 | 3 | Runoff from herbicide used on row crops. | Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties. |
| Benzo(a)pyrene [PAH] (nanograms/l). | .0002 | 1,000,000 | 200 | 0 | Leaching from linings of water storage tanks distribution lines. | Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer. |
| Carbofuran (ppb) | .04 | 1000 | 40 | 40 | Leaching of soil fumigant used on rice and alfalfa. | Some people who drink carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems. |
| Chlordane (ppb) | .002 | 1000 | 2 | 0 | Residue of banned termiticide | Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer. |
| Dalapon (ppb) | .2 | 1000 | 200 | 200 | Runoff from herbicide used on rights of way. | Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes. |
| Di(2-ethylhexyl) adipate (ppb). | .4 | 1000 | 400 | 400 | Discharge from chemical factories. | Some people who drink water containing di(2-ethylhexyl) adipate well in excess of the MCL over many years could experience toxic effects such as weight loss, liver enlargement or possible reproductive difficulties. |

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| Di(2-ethylhexyl) phthalate (ppb). | .006 | 1000 | 6 | 0 | Discharge from rubber and chemical factories. | Some people who drink water containing di(2-ethylhexyl) phthalate well in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer. |
| Dibromochloropropane (ppt) | .0002 | 1,000,000 | 200 | 0 | Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards. | Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive problems and may have an increased risk of getting cancer. |
| Dinoseb (ppb) | .007 | 1000 | 7 | 7 | Runoff from herbicide used on soybeans and vegetables. | Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties. |
| Diquat (ppb) | .02 | 1000 | 20 | 20 | Runoff from herbicide use. | Some people who drink water containing diquat in excess of the MCL over many years could get cataracts. |
| Dioxin [2,3,7,8-TCDD] (ppq). | .00000003 | 1,000,000,000 | 30 | 0 | Emissions from waste incineration and other combustion; Discharge from chemical factories. | Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer. |
| Endothall (ppb) | .1 | 1000 | 100 | 100 | Runoff from herbicide use. | Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines. |
| Endrin (ppb) | .002 | 1000 | 2 | 2 | Residue of banned insecticide. | Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems. |
| Epichlorohydrin. | TT | | TT | 0 | Discharge from industrial chemical factories; An impurity of some water treatment chemicals. | Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer. |

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| Ethylene dibromide (ppt) | .00005 | 1,000,000 | 50 | 0 | Discharge from petroleum refineries. | Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer. |
| Glyphosate (ppb) | .7 | 1000 | 700 | 700 | Runoff from herbicide use | Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties. |
| Heptachlor (ppt) | .0004 | 1,000,000 | 400 | 0 | Residue of banned pesticide. | Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer. |
| Heptachlor epoxide (ppt) | .0002 | 1,000,000 | 200 | 0 | Breakdown of heptachlor. | Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer. |
| Hexachlorobenzene (ppb) | .001 | 1000 | 1 | 0 | Discharge from metal refineries and agricultural chemical factories. | Some people who drink water containing Hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects and may have an increased risk of getting cancer |
| Hexachlorocyclopentadiene (ppb) | .05 | 1000 | 50 | 50 | Discharge from chemical factories | Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach. |
| Lindane (ppt) | .0002 | 1,000,000 | 200 | 200 | Runoff/leaching from insecticide used on cattle, lumber, gardens. | Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver. |

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| Methoxychlor (ppb) | .04 | 1000 | 40 | 40 | Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock. | Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties |
| Oxamyl [Vydate] (ppb) | .2 | 1000 | 200 | 200 | Runoff/leaching from insecticide used on apples potatoes and tomatoes. | Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects. |
| PCBs [Polychlorinated biphenyls] (ppt). | .0005 | 1,000,000 | 500 | 0 | Runoff from landfills Discharge of waste chemicals | Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer. |
| Pentachlorophenol (ppb) | .001 | 1000 | 1 | 0 | Discharge from wood preserving factories | Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer. |
| Picloram (ppb) | .5 | 1000 | 500 | 500 | Herbicide runoff | Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver. |
| Simazine (ppb) | .004 | 1000 | 4 | 4 | Herbicide runoff | Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood. |
| Toxaphene (ppb) | .003 | 1000 | 3 | 0 | Runoff/leaching from insecticide used on cotton and cattle. | Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer |

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Volatile organic contaminants:

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|----------------------------|------|------|-----|-----|--|--|
| Benzene (ppb) | .005 | 1000 | 5 | 0 | Discharge from factories; Leaching from gas storage tanks and landfills. | Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer. |
| Carbon tetrachloride (ppb) | .005 | 1000 | 5 | 0 | Discharge from chemical plants and other industrial activities. | Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with in their liver and may have an increased risk of getting cancer. |
| Chlorobenzene (ppb) | .1 | 1000 | 100 | 100 | Discharge from chemical and agricultural chemical factories | Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys. |
| o-Dichlorobenzene (ppb) | .6 | 1000 | 600 | 600 | Discharge from industrial chemical | Some people who drink water containing o-dichlorobenzene well in excess of the MCL over liver, kidneys, or circulatory systems. |
| p-Dichlorobenzene (ppb) | .075 | 1000 | 75 | 75 | Discharge from industrial chemical factories | Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood. |
| 1,2-Dichloroethane (ppb) | .005 | 1000 | 5 | 0 | Discharge from industrial chemical factories. | Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer |
| 1,1-Dichloroethylene (ppb) | .007 | 1000 | 7 | 7 | Discharge from industrial chemical factories. | Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver. |

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| cis-1,2-Dichloroethylene (ppb) | .07 | 1000 | 70 | 70 | Discharge from industrial chemical factories. | Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver. |
| trans-1,2-Dichloroethylene (ppb) | .1 | 1000 | 100 | 10 | Discharge from industrial chemical factories. | Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver. |
| Dichloromethane (ppb) | .005 | 1000 | 5 | 0 | Discharge from pharmaceutical and chemical factories | Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increase risk of getting cancer. |
| 1,2-Dichloropropane (ppb) | .005 | 1000 | 5 | 0 | Discharge from industrial chemical factories. | Some people who drink water containing 1,2-Dichloropropane excess of the MCL over many years may have an increased risk of getting cancer. |
| Ethylbenzene (ppb) | .7 | 1000 | 700 | 700 | Discharge from petroleum refineries. | Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys. |
| Haloacetic Acids (HAA) (ppb). | .060 | 1000 | 60 | N/A | By-product of drinking water disinfection. | Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer. |
| Styrene (ppb) | .1 | 1000 | 100 | 100 | Discharge from rubber and plastic factories and leaching from landfills. | Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys or circulatory system. |
| Tetrachloroethylene (ppb) | .005 | 1000 | 5 | 0 | Discharge from factories and dry cleaners. | Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer. |

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|-------------------------------------|-----------|------|--------|-----|--|--|
| 1,2,4-Trichlorobenzene (ppb) | .07 | 1000 | 70 | 70 | Discharge from textile-finishing factories. | Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands. |
| 1,1,1-Trichloroethane (ppb) | .2 | 1000 | 200 | 200 | Discharge from metal degreasing sites and other factories. | Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system. |
| 1,1,2-Trichloroethane (ppb). | .005 | 1000 | 5 | 3 | Discharge from industrial chemical factories. | Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems. |
| Trichloroethylene (ppb) | .005 | 1000 | 5 | 0 | Discharge from metal degreasing sites and other factories | Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer. |
| TTHMs [Total trihalomethanes] (ppb) | 0.10/.080 | 1000 | 100/80 | N/A | By-product of drinking water disinfection. | Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer. |
| Toluene (ppm) | 1 | | 1 | 1 | Discharge from petroleum factories. | Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver. |
| Vinyl Chloride (ppb) | .002 | 1000 | 2 | 0 | Leaching from PVC piping; Discharge from from plastics factories. | Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer. |
| Xylenes (ppm) | 10 | | 10 | 10 | Discharge from petroleum factories; Discharge from chemical factories. | Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system. |

Key:

AL=Action Level

MCLG=Maximum Contaminant Level Goal

MRDL=Maximum Residual Disinfectant Level

mrem/year=millirems per year (a measure of radiation absorbed by the body)

N/A=Not Applicable
clarity)

pCi/l=picocuries per liter (a measure of radioactivity)

ppb=parts per billion, or micrograms per liter ($\mu\text{g/l}$)

ppq=parts per quadrillion, or picograms per liter

MCL=Maximum Contaminant Level

MFL=million fibers per liter

MRDLG=Maximum Residual Disinfectant Level Goal

NTU=Nephelometric Turbidity Units (a measure of water

ppm=parts per million, or milligrams per liter (mg/L)

ppt=parts per trillion, or nanograms per liter

TT=Treatment Technique

Appendix D to R.61-58.12 - endnotes

¹ These arsenic values are effective January 23, 2006. Until then, the MCL is 0.05 mg/L and there is no MCLG.

† Until March 31, 2016

‡ Beginning April 1, 2016

APPENDIX B

REVISED TOTAL COLIFORM RULE (RTCR) RECORDS RETENTION SCHEDULE

The Revised Total Coliform Rule (RTCR) requires the South Carolina Department of Health and Environmental Control (the Department) to retain certain records concerning the Department and public water systems. These records consist of analytical results of public water system sampling, documents submitted by public water systems to the Department, and documentation of decisions that the Department makes concerning certain provisions in the RTCR.

- (1) The Department's Bureau of Water staff will be responsible for the filing and retention of analytical results for total coliform and *E. coli*. Hard copies of the results will be filed by system and will be retained for not less than one year. Results from the hard copies will be transferred to the SDWIS electronic data management system and will be retained there as well for not less than one year.
- (2) All of the decisions listed below will be made in writing. Bureau of Water staff will file hard copies of these documents by system, and will retain them for not less than five years. Second hard copies of the documents will be produced and then scanned, filed by system electronically, and retained for not less than five years. The scanned hard copies will not be retained.
 - a. Any case-by-case decision to waive the 24-hour time limit for repeat sample collection after a total coliform positive (TC+) routine sample, or to extend the 24-hour time limit for sample collection after invalidation, or for an unfiltered subpart H system to collect a total coliform (TC) sample after a >1 NTU turbidity measurement.
 - b. Any decision to waive the requirement for three routine samples the month following a TC+ sample, including all items required in the decision record.
 - c. Any decision to invalidate a TC+ sample, including all items required in the decision record.
- (3) Any completed and approved Level 1 or Level 2 assessment, including reports from the affected system on completed corrective actions, will be filed and retained in the same manner as in (2) above.

- (4) All of the decisions listed below will be made in writing. These documents will be filed and retained in the same manner as in (2) above, except instead of not less than five years, these documents will be retained for not less than the time needed to ascertain the current status of each public water system.
- a. Any decision to reduce the TC monitoring frequency to less than quarterly for ground water-only non-community water systems serving $\leq 1,000$ people, including the reduced frequency, and a copy of the document notifying the system of the reduced frequency.
 - b. Any decision to reduce the TC monitoring frequency to less than monthly for a community water system serving $\leq 1,000$ people, including the reduced frequency, and a copy of the document notifying the system of the reduced frequency.
 - c. Any decision to reduce the TC monitoring frequency to less than monthly during any month that a non-community water system serving $> 1,000$ people serves $\leq 1,000$ people, including the reduced frequency, and a copy of the document notifying the system of the reduced frequency.
 - d. Any decision to allow a public water system to forgo *E. coli* testing of a TC+ sample if the system assumes that the TC+ sample is *E. coli* positive.

APPENDIX C

Sanitary Survey Frequency

The Department timetable for conducting surveys is often the defining factor for scheduling system surveys. The following is the required minimum frequency for the different systems:

- 1) **Community** Water Systems (Type "C") are required to have **annual** Sanitary Surveys. Frequency of sanitary surveys for Community Water Systems that use ground water and have an exceptional compliance history may be reduced to once **every 2 years**.
- 2) **Non-Transient, Non-Community** Water Systems (Type "P") are required to have Sanitary Surveys **every two years**.
- 3) **Transient, Non-Community** Water Systems (Type "N") are required to have Sanitary Surveys **every three years**.
- 4) **State** Water Systems (Type "S") are required to have Sanitary Surveys **every five years**.

Total Coliform Reduced Monitoring

Item One: State Water Systems

Compliance monitoring will be reduced from quarterly to annually for water systems with:

- I. No TCR violations within the last calendar year;
- II. Satisfactory rating on the most recent routine sanitary surveys conducted within the last five (5) years.

Note: The system will revert to quarterly monitoring if a TCR violation or unsatisfactory survey occurs.

Item Two: Transient, Non-Community Water Systems

Compliance monitoring will be reduced from quarterly to annually for water systems with:

- I. No TCR violations within the last calendar year;
- II. Satisfactory rating on the most recent routine sanitary surveys conducted within the last three (3) years.

Note: The system will revert to quarterly monitoring if a TCR violation or unsatisfactory survey occurs.

South Carolina Department of Health and Environmental Control

Total Coliform Reduced Monitoring Guidance

Updated February 5, 2015

Topic

The Drinking Water Committee (DWC) was given the responsibility to determine which public water systems should be regulated and what level of oversight should be provided for all systems. The DWC understands the importance of providing high quality service to assure maximum public health protection. Therefore, the DWC developed the following procedures in order to maximize Department resources, eliminate duplication of effort, and maintain maximum public health protection.

Definitions

- 1) "Community Water Systems" means a public water system which serves at least fifteen (15) service connections used by year-round residents or regularly serves at least twenty-five (25) year-round residents. This may include, but not be limited to, subdivisions, municipalities, mobile home parks, apartments, etc.
- 2) "Non-community water system" means a public water system which serves at least fifteen (15) service connections or regularly serves an average of at least twenty-five (25) individuals daily at least sixty (60) days out of the year, and does not meet the definition of a community water system.
- 3) "Non-transient non-community water system" means a public water system that is not a community water system and that regularly serves at least twenty-five (25) of the same persons more than six months per year.
- 4) "State Water System" or SWS means any water system that serves less than fifteen (15) service connections or regularly serves an average of less than twenty-five (25) individuals daily.
- 5) "Transient non-community water system" or TWS means a non-community water system that does not regularly serve at least twenty-five (25) of the same persons more than six months per year.
- 6) "Department" means the South Carolina Department of Health and Environmental Control, including personnel thereof authorized and empowered by the Board to act on behalf of the Department or Board.

Item Three: Non-Transient, Non-Community Water Systems

Mandatory oversight monitoring by the Department has been eliminated. ?

Item Four: Community Water Systems

Mandatory oversight monitoring by the Department has been eliminated. ?

APPENDIX D

31. Sample Siting Plan

Purpose:

The purpose of this item is to evaluate the system's sample siting plan to determine if it is adequate to ensure that there is no place in the distribution system where microbiological contamination could persist indefinitely with little chance of detection.

Inspection Guidelines:

All Public Water Systems must collect coliform samples according to a written sample siting plan. This plan ensures that samples are collected at locations representative of the entire distribution system. Sample siting plans are required to be kept updated and should be reviewed during each sanitary survey. The inspector should review the written plan during the survey and determine if the plan is representative of water throughout the distribution system and that the plan it is adequately written to allow someone with limited knowledge of the system to carry out the plan.

The plan must contain routine and repeat sampling locations representative of the distribution system, as well as the sample collection schedule. The sample sites in the plan should be located in accessible locations at a customer's premises, dedicated sampling station, or other designated sampling site. For ground water systems, any sample locations that will be used as dual sample sites to meet the triggered source water monitoring requirements under the Ground Water Rule must also be included in the sample siting plan.

The plan must include a map of the distribution system and a detailed description of how the sampling plan will be carried out. The distribution map must show the locations of all: distribution water lines, water sources, storage tanks and sampling points.

The sample siting plan should be designed such that system coverage is accomplished with each month's samples. Systems that are required to take more than five (5) samples per month must take the samples at regular time intervals throughout the month. All major portions of the distribution system must be covered by the sampling plan. Each routine sample point in the plan must be sampled at least every three (3) months. The sample plan should avoid sampling points that are served by major transmission mains, and should target areas served by smaller pipes or dead end lines.

The inspector must review the plan for adequacy. The plan must be representative of the entire distribution system. The plan must include all routine, repeat, and Ground Water Rule triggered source monitoring (for ground water systems) sites. The inspector must also determine if the system is taking the correct number of samples for the system's population (see table below). It is appropriate for the inspector to remind systems to review the plan annually for adequacy and to contact either the local Regional office, or the Drinking Water Protection Division in Columbia for questions or when making revisions.

*Sample sites
not included in plan
Sample Siting Plan*

| Minimum Population Served | Minimum Number of Samples per Month | Minimum Population Served | Minimum Number of Samples per Month |
|---------------------------|-------------------------------------|---------------------------|-------------------------------------|
| 1,001 to 2,500 | 2 | 70,001 to 83,000 | 80 |
| 2,501 to 3,300 | 3 | 83,001 to 96,000 | 90 |
| 3,301 to 4,100 | 4 | 96,001 to 130,000 | 100 |
| 4,101 to 4,900 | 5 | 130,001 to 220,000 | 120 |
| 4,901 to 5,800 | 6 | 220,001 to 320,000 | 150 |
| 5,801 to 6,700 | 7 | 320,001 to 450,000 | 180 |
| 6,701 to 7,600 | 8 | 450,001 to 600,000 | 210 |
| 7,601 to 8,500 | 9 | 600,001 to 780,000 | 240 |
| 8,501 to 12,900 | 10 | 780,001 to 970,000 | 270 |
| 12,901 to 17,200 | 15 | 970,001 to 1,230,000 | 300 |
| 17,201 to 21,500 | 20 | 1,230,001 to 1,520,000 | 330 |
| 21,501 to 25,000 | 25 | 1,520,001 to 1,850,000 | 360 |
| 25,001 to 33,000 | 30 | 1,850,001 to 2,270,000 | 390 |
| 33,001 to 41,000 | 40 | 2,270,001 to 3,020,000 | 420 |
| 41,001 to 50,000 | 50 | 3,020,001 to 3,960,000 | 450 |
| 50,001 to 59,000 | 60 | 3,960,001 or more | 480 |
| 59,001 to 70,000 | 70 | | |

Evaluation Criteria:

(N) A Not Applicable rating should be given for this item to State systems.

(S) If the sample siting plan includes a detailed description of how the plan is carried out as well as an adequate map (if required) that identifies the required system components (i.e. tanks, valves, etc.) and all sampling points, then a Satisfactory rating should be given for this item.

(I) If all of the elements for a proper plan are in place, but there are some elements of the plan that are missing or should be changed (i.e. no written procedure, sampling points on major transmission lines, lack of full system coverage, etc.) then a Needs Improvement rating should be given, and the system should be asked to revise the plan.

(U) If the system does not seem to have a documentable sampling procedure, a rating of Unsatisfactory should be given. An Unsatisfactory rating may also be given if no action has been taken to correct a rating of Needs Improvement given in a previous survey.

References:

R.61-58.5 I (1)(a): (Total Coliform Rule Requirements)

R.61-58.7 B (2)(f): (Operation and Maintenance Criteria)

APPENDIX E



Level 1 Water Quality Assessment For Bacterial Contamination

| | | |
|--|---------------|-------------------|
| System Name | System Number | Population Served |
| System Mailing Address | Contact Phone | System Capacity |
| Source Type: Groundwater / Purchase Groundwater / Purchase Surface Water | | |

General:

| | | Issue Description | Corrective Action & Date |
|--|--------|-------------------|--------------------------|
| Were there any operation or maintenance activities that could have introduced coliform bacteria? | Y N | | |
| Were there any visible indications of unsanitary conditions? | Y N | | |
| Was there any unauthorized access to the facilities? | Y N | | |
| Did the system lose pressure? | Y N | | |

Source Assessment

| | | Issue Description | Corrective Action & Date |
|--|--------|-------------------|--------------------------|
| Are there any obvious contamination sources within a 100-foot radius of the wellhead? | Y/N | | |
| Have there been any spills or other disturbances within a 100-foot radius of the well? | Y/N | | |
| Is there evidence of standing water near the wellhead? | Y/N | | |
| Is the sanitary seal intact? | Y/N | | |
| Is the well vent screened? | Y/N | | |
| How far does the casing extend above grade? | | | |
| Is the wellhead and piping secured to prevent unauthorized access? | Y N | | |



Storage Assessment

| | | |
|-------------------------|---------------|---|
| Tank name/site location | Tank capacity | Type: Bladder / Pneumatic / Atmospheric |
|-------------------------|---------------|---|

| | | Issue Description | Corrective Action & Date |
|--|------------|-------------------|--------------------------|
| Has there been any recent work done on the tank? | Y/N | | |
| Are the overflow and vents properly screened? | Y/N | | |
| Is the tank and tank site secured to prevent unauthorized access? | Y/N | | |
| Could the physical condition of the tank be a source of contamination? | Y/N | | |
| If a pressure tank, is it maintaining an appropriate minimum pressure? | Y N N/A | | |
| If a pressure tank, is it waterlogged? | Y N N/A | | |
| Is the tank being maintained properly? | Y/N | | |
| When was the last time the tank was cleaned, painted, or coated? | Y/N | | |
| Is the tank deteriorated or leaking? | Y/N | | |
| Other comments on storage. | | | |

Distribution System Assessment

| | | Issue Description | Corrective Action & Date |
|---|-----|-------------------|--------------------------|
| Repair Contractor name and number: | | | |
| Were there any recent low-pressure events in the distribution system? | Y/N | | |
| Has there been any recent distribution system flushing? | Y/N | | |
| Were there any main breaks, repairs, or additions? | Y/N | | |
| Are there backflow devices present or other indications of cross-connections? | Y/N | | |
| Other comments on distribution: | | | |



Sample Site Assessment

| | |
|--|--|
| Sample tap location (address): | Type: Outside hose bib Inside sink Other |
| Sample tap condition: Good Fair Poor | |

| | | Issue Description | Corrective Action & Date |
|--|-----|-------------------|--------------------------|
| Are there any treatment devices at this location? | Y/N | | |
| Has there been any recent plumbing work near the sample location? | Y/N | | |
| Was the proper sample protocol followed during collection and transport? | Y/N | | |
| Other comments on the sample site or sample tap? | | | |

Other comments on the water system:

Print name of person completing form: _____ Date: _____

Signature: _____



Level 2 Water Quality Assessment for Bacterial Contamination

| | | |
|--|---------------|---|
| System Name | System Number | Population Served |
| System Mailing Address | Contact Phone | Source Type: Groundwater / Purchase Groundwater Surface Water / Purchase Surface Water |
| System Operator of Record | | System Capacity |
| Person(s) who collected total coliform samples (if not operator of record) | | Sample Collector's Employer |

Part 1 General: Did any of the following situations occur before the positive coliform samples were collected?

| | | Issue Description | Corrective Action & Date |
|---|--------|-------------------|--------------------------|
| Were there any operation or maintenance activities that could have introduced coliform bacteria? | Y N | | |
| Where there any interruptions in the treatment process? | Y N | | |
| Were there any visible indications of unsanitary conditions? | Y N | | |
| Did the system lose positive pressure? | Y N | | |
| Was there any unauthorized access to the facilities? | Y N | | |
| Were there other samples taken and not used for compliance that were positive for total coliform? | Y N | | |
| Was there a fire-fighting event or flushing operation? | Y N | | |
| Were there any other situations that occurred before the positive samples were collected? | Y N | | |



Part 2: Source Assessment (complete a separate page for each well or source)

| | |
|------------------|--|
| Well name/number | Well use: Primary / Backup / Emergency / Other |
|------------------|--|

| | | Issue Description | Corrective Action & Date |
|--|---|-------------------|--------------------------|
| Are there any obvious contamination sources within a 100-foot radius of the wellhead? | Y | | |
| | N | | |
| Have there been any sewer spills, source water spills, or other disturbances within a 100-foot radius of the well? | Y | | |
| | N | | |
| Is there evidence of standing water near the wellhead? | Y | | |
| | N | | |
| Are the wellhead and piping exposed to the weather? | Y | | |
| | N | | |
| Is the sanitary seal intact? | Y | | |
| | N | | |
| Is the well vent screened? | Y | | |
| | N | | |
| How far does the casing extend above grade? | | | |
| Are the wellhead and piping secured to prevent unauthorized access? | Y | | |
| | N | | |
| Have any additional sources recently been put into service? | Y | | |
| | N | | |
| Was the additional source tested before being put into service? | Y | | |
| | N | | |
| Other comments on wellhead. (Are there aspects of well construction and/or operation that could have caused positive samples?) | Y | | |
| | N | | |



Part 3: Treatment Assessment (if treatment provided)

| Part 3: Treatment Assessment (if treatment provided) | Issue Description | Corrective Action & Date |
|--|--------------------------|--------------------------|
| Does the system provide treatment? (If yes, describe the treatment) | Y N | |
| Have there been any recent treatment changes? (Installation or repair of equipment, failure of equipment, etc.) | Y N | |
| Are all treatment devices operational? | Y N | |
| Are all treatment devices maintained? | Y N | |
| Have there been any recent treatment <i>process</i> changes (new chemical, application point moved, new vendor, new treatment process, etc.) | Y N | |
| Where there any interruptions or stopages in any of the treatment processes? (lapse of chemical feed, etc.) How long? | Y N | |
| What is the free chlorine residual immediately downstream from the treatment process(es) today? | Enter residual(s) or N/A | |
| Was the system flow rate greater than any treatment system capacity? | Y N | |
| Other comments on the treatment system(s) | Y N | |



Part 4: Storage Assessment (complete a separate page for each tank)

| | | |
|-------------------------|---------------|---|
| Tank name/site location | Tank capacity | Type: Bladder / Bladderless / Diaphragm / Atmospheric |
|-------------------------|---------------|---|

| | | Issue Description | Corrective Action & Date |
|---|------------|-----------------------|--------------------------|
| Was there been any recent work done on the tank? | Y N | | |
| Are the overflow and vents properly screened? | Y N | | |
| Is the tank and tank site secured to prevent unauthorized access? | Y N | | |
| Could the physical condition of the tank be a source of contamination? | Y N | | |
| If a pressure tank, is it maintaining an appropriate minimum pressure? | Y N N/A | | |
| If a pressure tank, is it waterlogged? | Y N N/A | | |
| Is the tank being operated properly? | Y N | | |
| Is the tank being maintained properly? | Y N | | |
| When was the last time the tank was cleaned, painted, or coated? | Y N | | |
| Is there any visual deterioration of the tank? | Y N | | |
| Are there any visual leaks in the tank? | Y N | | |
| Is there any evidence of intentional contamination of or tampering with the tank? | Y N | | |
| What is the disinfectant residual leaving the tank today? | | Enter residual or N/A | |
| Is there any thing else related to the storage tank that could relate to positive coliform samples? | Y N | | |
| Other comments on storage. | Y N | | |



Part 5: Distribution System Assessment

| Part 5: Distribution System Assessment | | Issue Description | Corrective Action & Date |
|---|-------------------------|---|--------------------------|
| Does the system employ or contract with a certified distribution system operator? | Employ Contract | Distribution system operator name and number: | |
| Does the water system perform their own repairs or contract the work? | Own repairs Contract | Contract company: Contract phone: | |
| If repairs are performed by the water system, does the system have repair procedures? | Y N | | |
| Were there any recent low-pressure events in the distribution system? | Y N | | |
| Were there any scheduled flushing events in the distribution system? | Y N | | |
| Were there any main breaks, repairs, or additions? | Y N | | |
| Were there any sanitary defects in the booster pump station(s)? | Y N N/A | | |
| Is the air relief valve vault(s) subject to flooding or does the vent(s) terminate below grade? | Y N N/A | | |
| Are valves on water mains regularly maintained? | Y N | | |
| Are fire hydrants regularly maintained? | Y N N/A | | |
| Is there any evidence of intentional contamination in the distribution system? | Y N | | |
| Are there other distribution system factors that could have contributed to positive coliform samples? | Y N | | |



Part 6: Sample Site Assessment (complete a separate sheet for each location that had a positive sample)

| | |
|--|--|
| Sample tap location (address): | Type: Outside hose bib Inside sink Other |
| Sample tap condition: Good Fair Poor | |

| | | Issue Description | Corrective Action & Date |
|--|--------|-------------------|--------------------------|
| Has there been any recent plumbing work near the sample location? | Y N | | |
| Have there been any plumbing breaks or failures? | Y N | | |
| Have there been any reports of low or loss of pressure at the sample site? | Y N | | |
| Are there any treatment devices at this location? | Y N | | |
| Was the proper sample protocol followed during collection and transport? | Y N | | |
| Other comments on the sample site or sample tap? | Y N | | |



Part 7: Operations Assessment

| | | Issue Description | Corrective Action & Date |
|---|---|-------------------|--------------------------|
| Have there been any recent operational changes? | Y | | |
| | N | | |

Part 8: Environmental Factors

| | | Issue Description | Corrective Action & Date |
|--|---|-------------------|--------------------------|
| Was there a heavy rainfall event near the time the sample(s) were collected? | Y | | |
| | N | | |
| Has there been any flooding? | Y | | |
| | N | | |
| Have there been extremes in heat or cold? | Y | | |
| | N | | |
| Have there been changes in available source water? (significant drop in water table, well levels, etc) | Y | | |
| | N | | |
| Have there been any interruptions to electrical power? | Y | | |
| | N | | |

Print name of person completing form: _____ Date: _____

Signature: _____

| | | | |
|--|-----|------------------------|--|
| DHEC staff use only | | | |
| Assessment has been successfully completed | Y N | Name of DHEC Reviewer: | |

APPENDIX F



Seasonal Water System Start-up Procedure Certification Checklist

Water System Name _____

Water System Number _____

Water System Owner _____

Anticipated Start-up Date _____ Anticipated Shutdown Date _____

Anticipated average population served per day during operating period _____

DHEC has classified your water system as a seasonal water system since it is not operated year-round, and starts up and shuts down at the beginning and end of each operating season. At the beginning of each operating season, before serving water to the public, you must conduct the DHEC-approved start-up procedures listed below. Please certify to each procedure that you have completed by placing a check in its corresponding check box.

- All water system components have been inspected, including sources, treatment facilities, distribution lines, and storage tanks.
- All issues discovered during the water system inspection have been corrected.
- All stagnant water has been flushed from system.
- DHEC has conducted a site visit and collected a sample.
- The sample result was absent for total coliform.
- The system was disinfected for at least 24 hours and flushed (mandatory after a positive total coliform sample, optional before the DHEC site visit)

I certify that the above information is accurate.

Printed name of owner's representative _____

Signature of owner's representative _____

Date _____