The Texas Commission on Environmental Quality (TCEQ or commission) adopts amendments to §§290.38, 290.39, 290.41, 290.42, 290.44 - 290.47, 290.101 - 290.104, 290.106 - 290.110, 290.112 - 290.114, 290.117 - 290.119, 290.121, 290.122, 290.272, 290.273, 290.275, and the repeal of §290.111. The commission adopts new §§290.111, 290.115, and 290.116.

Sections 290.39, 290.41, 290.44, 290.45, 290.47, 290.101, 290.102, 290.104, 290.106, 290.107, 290.108, 290.110, 290.114, 290.117, 290.118, 290.272, 290.273, 290.275, and the repeal of §290.111 are adopted *without changes* as published in the August 10, 2007 issue of the *Texas Register* (32 TexReg 4876) and will not be republished. Sections 290.38, 290.42, 290.46, 290.103, 290.109, 290.111, 290.112, 290.113, 290.115, 290.116, 290.119, 290.121, and 290.122 are adopted *with changes* to the proposed text.

BACKGROUND AND SUMMARY OF THE FACTUAL BASIS FOR THE ADOPTED RULES

The primary purposes of the adopted amendments and new rules are to implement federal regulations pertaining to the safety of drinking water from groundwater and surface water sources. The adopted amendments also limit the exposure of the public to waterborne disease and enhance the customer's ability to know if there is something harmful in their drinking water. These amendments and new rules are adopted in response to the United States Environmental Protection Agency (EPA) Stage 2 Disinfectants and Disinfection Byproducts Rule (DBP2) and Long Term 2 Enhanced Surface Water Treatment Rule (LT2) promulgated in January 2006; the Ground Water Rule (GWR) promulgated in October 2006; and the Public Notification Rule (PNR) promulgated in 2000. These rules are necessary for the state to maintain primacy for regulating public water systems (PWSs).

DBP2 provides public drinking water customers more equitable protection from the risks of disinfection byproducts. Its provisions include a one-year period of EPA-required increased early implementation sampling called the Initial Distribution System Evaluation (IDSE) that will be used to select new compliance monitoring sites; new compliance determination methods; operational evaluation level reporting; increased detail for currently required monitoring plans; and updated analytical methods.

LT2 provides increased protection from the protozoan *Cryptosporidium* found in surface water. Its provisions include a special period of increased early implementation sampling to determine the concentration of *Cryptosporidium* oocysts in source water; new required treatment levels for *Cryptosporidium* removal determined on a plant-by-plant basis; defined technologies for *Cryptosporidium* removal called the "microbial toolbox"; and updated analytical methods.

The GWR provides greater protection from pathogens to customers of PWSs that provide drinking water, in part or in whole, from sources of groundwater. Provisions of EPA's rule include raw water sampling at wells following any total coliform detection in a distribution system; required corrective action if fecal indicators are detected in a well; newly defined violations for the presence of fecal contaminants in raw water; and updated analytical methods.

TCEQ adopted requirements of the federal PNR in 2002, but three provisions remain to be added to our rule language. First, the rules require all public water systems that must issue public notice to certify in writing that the notice has been sent. Second, the rules change the amount of time in which a public water system must notify the TCEQ and its customers of an acute violation from one business day to 24 hours.

Third, the rules ensure appropriate enforcement and tracking of public notice violations by including a reference to public notice violations under each constituent's compliance determination subsection. The commission also adopts changes to ensure consistency of the state rules with the existing federal Total Coliforms (Including Fecal Coliforms and E. Coli) rule (TCR) and Disinfectants and Disinfection Byproducts rule (DBP1).

Additionally, the adopted rules reflect changes to the Texas Health and Safety Code (THSC), §341.033(i), made during the 79th Legislature, regarding homeland security. Finally, the commission adopts the definition of "process control duties" from 30 TAC §30.387, to this chapter.

Throughout the preamble the commission notes that the amendments that it is making are being adopted to make its rules consistent with the federal rules. When the commission uses the words "consistent with" in the preamble they mean the following: Where the EPA provided flexibility for the state to implement the federal rules, the commission is proposing rules that provide standards consistent with the federal directives and that fit with existing state rules. Where EPA did not provide flexibility to the states, the commission has incorporated the federal rule requirements into Chapter 290 but changed the language, without changing the regulatory requirements, to fit the state rules.

SECTION BY SECTION DISCUSSION

In addition to implementation of the federal laws discussed previously, the commission adopts administrative changes throughout the adopted rule to reflect the agency's current practices and to conform with Texas Register and agency guidelines. These changes include updating references to the

TCEQ's predecessor agencies, updating cross-references, deleting effective dates that have already passed, and correcting typographical, spelling, and grammatical errors.

Subchapter D: Rules and Regulations for Public Water Systems

Subchapter D contains requirements for the physical facilities associated with public water systems. TCEQ must review and approve plans for facilities under EPA's special primacy conditions of the federal LT2 in 40 Code of Federal Regulations (CFR) §141.2.

Section 290.38, Definitions, contains definitions related to the design, pressure, flow, and treatment requirements that are contained in Subchapter D.

The commission adopts §290.38 to add definitions found in LT2 and renumbers the current definitions to maintain alphabetical order.

Specifically, the commission adopts §290.38 to add definitions for the following terms: bag filter; cartridge filter; filtrate; and membrane filtration to incorporate definitions in 40 CFR Part 142.

The commission also adopts §290.38 to add definitions for the following terms: challenge test; direct integrity test; indirect integrity monitoring; log removal value (LRV); membrane LRVC-Test; membrane module; membrane sensitivity; membrane unit; quality control release value (QCRV); resolution; and sensitivity. The term "log removal" is a term of art that describes the percent removal of a constituent: 1-log removal equals 90% removal; 2-log removal equals 99% removal; and so forth. These definitions are

based on definitions in the federal LT2 in 40 CFR §141.719 and Glossary EPA 815-R-06-009, the EPA Membrane Filtration Guidance Manual.

The commission also adopts §290.38 to add the definitions of "chemical disinfectant" and "reactor validation testing" to incorporate definitions in the federal LT2 in 40 CFR §141.720 and the EPA 815-R-06-007, EPA Ultraviolet Disinfection Guidance Manual Glossary, and to amend the definition of "disinfectant" to differentiate this definition from the definition of "chemical disinfectant."

The commission moves the definition for "innovative/alternate treatment" from §290.42(g) to §290.38 for consistency with the organizational principle that definitions be grouped in this section. This definition is also amended for consistency with the microbial toolbox options for meeting *Cryptosporidium* treatment requirements in the federal LT2 in 40 CFR §141.715.

The commission deleted the definition of "Uniform Fire Code" in §290.38(73) and added the definition of "International Fire Code" in §290.38(33) in response to a comment. The definitions following the term "International Fire Code" have been renumbered accordingly.

The commission moves the definition of "process control duties" from §30.387(5) to §290.38 because the definition applies to allowable activities at public water systems, not to individuals who are licensed water operators. Chapter 30 contains requirements for becoming licensed as a public water system operator, as contrasted with Chapter 290, Subchapter F, which contains the requirements related to what types of operators a public water system must hire, and what duties those personnel may perform. The rule language of Chapter 30 related to water operators was revised during the Occupational Licensing rule

package by deleting the definition of "process control duties" and moving it to Chapter 290. The language was deleted from those rules based on an interoffice agreement that it is better placed in Chapter 290. The docket number for the Occupational Licensing rule package is 2006-1699-RUL and the rule project number is 2006-041-030-CE. The Occupational Licensing rule package was adopted by the commission during agenda in September 2007. The Occupational Licensing rule package was published in the *Texas Register* on September 21, 2007, and was effective September 27, 2007.

Section 290.39, General Provisions, describes how public water systems must submit plans or exception requests.

The commission adopts new §290.39(j)(1)(E) to specifically state the requirements of the federal LT2 in 40 CFR §141.719(b)(2)(viii) that describes how the executive director will determine the ability of modified membrane modules to inactivate microorganisms.

The commission adopts new §290.39(l)(4) to specifically state the requirements of the federal LT2 in 40 CFR §141.721(f) that the executive director be able to establish requirements for systems that have been issued an exception.

The commission adopts §290.41, Water Sources, to incorporate the requirements for sources of water that are used as drinking water, for example, location and construction requirements for wells or surface water intake structures.

The commission adopts §290.41(c)(3)(C) to reference the most current version of the American Water Works Association (AWWA) Standard for Water Wells and the most current standard's appendices.

The commission adopts new §290.41(d)(5) to incorporate 40 CFR §141.710(f) which requires systems with new springs or similar source to perform microbiological source water quality testing to determine the level of treatment required under LT2.

The commission adopts §290.41(e)(1)(F) to include the proper spelling of the word *Escherichia* and the proper italicization of the words *E. coli*, *Giardia*, and *Cryptosporidium*.

The commission adopts new §290.41(e)(1)(G) to incorporate 40 CFR §141.710(f) requiring systems with new surface water intakes, groundwater sources under the direct influence of surface water, and bank filtration wells to perform microbiological source water quality testing to determine the level of treatment, known as Bin Classification, required under LT2.

The commission adopts §290.42, Water Treatment, to incorporate design and construction requirements related to drinking water treatment. It also provides the conditions under which a treatment process can be considered acceptable to meet the health-based standards of Subchapter F.

The commission adopts §290.42(a)(2) by changing the term "underground water" to "groundwater" to be consistent with the use of the term "groundwater" throughout the subchapter.

The commission adopts new §290.42(b)(8) to incorporate the requirements of the federal GWR in 40 CFR §141.403(a)(6)(iv) that the executive director may require viral treatment on groundwater systems based on raw water sampling results showing the presence of fecal indicator organisms.

The commission adopts §290.42(c)(1) to incorporate the requirements of the federal LT2 in 40 CFR §141.711(a) that systems using spring or other water sources with raw water monitoring results showing the presence of fecal indicators may be required to design treatment systems to achieve higher levels of *Cryptosporidium* treatment.

The commission adopts §290.42(c)(6) to eliminate the date because the effective date of the regulation change has passed.

The commission adopts §290.42(d)(1) to incorporate the requirements of the federal LT2 in 40 CFR §141.711(a) that systems using surface water sources with raw water monitoring results showing elevated levels of *Cryptosporidium* will be required to design treatment systems to achieve higher levels of *Cryptosporidium* treatment.

The commission adopts §290.42(d)(3) and (11)(E)(ii) to eliminate the dates because the effective dates of the regulation changes have passed.

Based on a comment, the commission replaced the definition of "Uniform Fire Code" with the definition of "International Fire Code" in §290.38. Because of this change, the commission amended the reference in §290.42(e)(4)(C) from "Uniform Fire Code (UFC)" to "International Fire Code (IFC)."

Based on a comment, the commission replaced the definition of "Uniform Fire Code" with the definition of "International Fire Code" in §290.38. Because of this change, the commission amended the reference in §290.42(e)(6) from "UFC" to "IFC."

The commission adopts §290.42(g) to include the review and design requirements of bag and cartridge filtration, membrane filtration, and ultraviolet (UV) disinfection as specified in 40 CFR §141.119 and §141.120. Currently, the only innovative treatment with specific requirements is package treatment. Bag and cartridge filtration, membrane filtration, and ultraviolet (UV) disinfection are alternate treatment techniques included in the LT2 "microbial toolbox" which are identified as the most likely to be used by Texas systems to meet the new LT2 requirements. The addition of the other innovative treatments with specific design requirements under the federal LT2 from EPA creates the need for new, separate paragraphs.

Specifically, the commission adopts §290.42(g) by moving the definition of "innovative/alternate treatment" systems from the text of this subsection to §290.38 for consistency with the organizational principle that groups all definitions related to this subchapter in §290.38.

The commission adopts §290.42(g) to incorporate the requirement that the executive director have the ability to require and review pilot protocols prior to pilot studies. The amendment is consistent with existing rules and new federal law. The existing requirements of §290.39(l) and the new requirements of the federal LT2 in 40 CFR §141.119 and §141.120 include provisions for challenge studies and validation

studies. Existing §290.121 also requires that all compliance samples have a monitoring plan approved by the executive director.

The commission adopts new §290.42(g)(1) to contain the sentence in existing §290.42(g) regarding the design requirements for package-type treatment systems.

The commission adopts new §290.42(g)(2) to incorporate the requirements of the federal LT2 in 40 CFR §141.719(a) that bag and cartridge filtration systems can receive microbiological treatment credit if specified criteria are met.

The commission adopts new §290.42(g)(2)(A) to incorporate the criteria of 40 CFR §141.719(a) that bag and cartridge filtration systems can only receive microbiological treatment credit if the entire plant flow is treated by the filters.

The commission adopts new §290.42(g)(2)(B) to incorporate the criteria of 40 CFR §141.719(a) that bag and cartridge filtration systems can only receive microbiological treatment credit if approved by the executive director based on challenge testing that must be conducted in accordance with criteria established by EPA and the executive director.

The commission adopts new §290.42(g)(2)(B)(i) to incorporate the criteria of 40 CFR §141.719(a)(1) that bag and cartridge filtration systems must apply a factor of safety to the log removal credit determined from challenge testing.

The commission adopts new §290.42(g)(2)(B)(ii) to incorporate the criteria of 40 CFR §141.719(a)(2) that bag and cartridge filtration systems can only receive microbiological treatment credit if the challenge testing is performed on bag or cartridge filtration devices that are identical to the filtration devices that will be used by the public water system.

The commission adopts new §290.42(g)(2)(B)(iii) to incorporate the criteria of 40 CFR §141.719(a)(2) that bag and cartridge filtration systems can only receive microbiological treatment credit if the challenge testing is performed on bag or cartridge filtration devices that are arranged in an identical configuration to the filtration devices that will be used by the public water system.

The commission adopts new §290.42(g)(2)(B)(iv) to incorporate the criteria of 40 CFR §141.719(a)(1) that bag and cartridge filtration systems can receive microbiological treatment credit based on challenge testing performed before January 5, 2006 if the testing met the EPA criteria, is submitted by the system and is approved by the executive director.

The commission adopts new §290.42(g)(2)(B)(v) to incorporate the criteria of 40 CFR §141.719(a)(10) that bag and cartridge filtration systems can only receive microbiological treatment credit if the bag or cartridge filtration devices used in the challenge study have not been modified in a manner that could change the removal efficiency of the filter and to provide that if the bag or cartridge filtration device has been modified in this manner, a new challenge study must be conducted.

The commission adopts new §290.42(g)(2)(C) to incorporate the requirement of the federal LT2 in 40 CFR §141.719(a) that bag and cartridge filtration systems can only receive microbiological treatment

credit if the membrane systems have been challenge tested, have the ability for direct and indirect integrity testing, and are designed to meet the other requirements of this section.

The commission adopts new §290.42(g)(3) to incorporate the requirements of 40 CFR §141.719(b) describing the conditions under which membrane filtration systems can receive microbiological treatment credit under LT2.

The commission adopts new §290.42(g)(3)(A) to incorporate the criteria of the federal LT2 in 40 CFR §141.719(b)(2) that membrane filtration systems can only receive microbiological treatment credit if approved by the executive director based on challenge testing that must be conducted in accordance with criteria established by EPA and the executive director.

The commission adopts new §290.42(g)(3)(A)(i) to incorporate the criteria of 40 CFR §141.719(b)(2)(v) - (vii) that membrane systems can only receive microbiological treatment credit if, before stating the challenge tests, the system submits and receives executive director approval for the challenge testing protocol. That protocol must include the plan for testing the membranes and for calculating how well the membranes remove microbes.

The commission adopts new §290.42(g)(3)(A)(ii) to incorporate the criteria of 40 CFR §141.719(b)(2)(i) that membrane systems can only receive microbiological treatment credit if the challenge testing is performed on membrane filtration devices that are identical to the filtration devices that will be used by the public water system. If smaller-scale membrane devices are used in the challenge testing, then they

must be identical in material and similar in construction to the filtration devices that will be used by the public water system.

The commission adopts new §290.42(g)(3)(A)(iii) to incorporate the criteria of 40 CFR §141.719(b)(2) that membrane filtration systems can receive microbiological treatment credit based on challenge testing performed before January 5, 2006, if the testing met the EPA criteria, is submitted by the system and is approved by the executive director.

The commission adopts new §290.42(g)(3)(A)(iv) to incorporate the criteria of 40 CFR §141.719(b)(2)(viii) that membranes can only receive microbiological treatment credit if the membrane devices used in the challenge study have not been modified in a manner that could change the removal efficiency of the filter, or the quality control release value. If a membrane filtration device has been modified in this manner, a new challenge study must be conducted.

The commission adopts new §290.42(g)(3)(B) to incorporate the requirement of the federal LT2 in 40 CFR §141.719(b)(3) that membrane filtration system can only receive microbiological treatment credit if the membrane systems is designed to conduct and record the results of direct integrity tests demonstrating a removal efficiency equal to or greater than the removal credit awarded by the executive director.

The commission adopts new §290.42(g)(3)(B)(i) to incorporate the criteria of 40 CFR §141.719(b)(3)(i), that membrane systems be designed to allow direct integrity testing of each membrane unit.

The commission adopts new §290.42(g)(3)(B)(ii) to incorporate the criteria of 40 CFR §141.719(b)(3)(ii), that membrane systems be designed to allow direct integrity testing that has a resolution of 3 micrometers or less.

The commission adopts new §290.42(g)(3)(B)(iii) to incorporate the criteria of 40 CFR §141.719(b)(3)(iii), that membrane systems be designed to allow direct integrity testing that has a sensitivity to verify log removal credit that meets EPA criteria.

The commission adopts new §290.42(g)(3)(B)(iv) to incorporate the ability of the state described in 40 CFR §141.719(b)(3)(iv) to approve less frequent direct integrity testing.

The commission adopts new §290.42(g)(3)(C) to incorporate the requirement of 40 CFR §141.719(b)(4) and (4)(i) that membrane filtration systems can only receive microbiological treatment credit if the membrane system is designed to conduct and record the results of continuous indirect integrity tests, describes the equipment required to perform these tests, and restates the ability of the state to allow alternative monitoring technology as contained in existing §290.39(1).

The commission adopts new §290.42(g)(3)(D) and (D)(i) and (ii) to incorporate the requirement of 40 CFR §141.719(b)(1) that the microbiological treatment credit that membrane filtration systems can receive is no greater than the lower of the credits received through challenge testing or direct integrity testing.

The commission adopts new §290.42(g)(3)(E) to incorporate the requirement of 40 CFR §141.719(b) that membrane filtration systems can only receive microbiological treatment credit if the membrane systems have been challenge tested, have the ability for direct and indirect integrity testing, and are designed to meet the other requirements of this section.

The commission adopts new §290.42(g)(3)(F) to incorporate the requirement of EPA 815-R-06-009, EPA Membrane Filtration Guidance Manual, that membrane filtration systems can only receive microbiological treatment credit if the membrane systems are designed with the described cross connection control measures.

The commission adopts new §290.42(g)(4) to incorporate the requirements of 40 CFR §141.73(d) describing how bag, cartridge and membrane filters can receive microbial credit before the compliance date of LT2. In response to comment, the commission clarified that a system can receive up to a 2.0-log removal credit for *Cryptosporidium* and up to a 3.0-log removal credit for *Giardia*.

The commission adopts new §290.42(g)(5) to incorporate the requirements of the federal LT2 in 40 CFR §141.720(d)(1) that UV light reactors may receive microbiological treatment credit.

The commission adopts new §290.42(g)(5)(A) to incorporate the criteria of 40 CFR §141.720(d)(1) that UV light reactors can only receive microbiological treatment credit if the UV light reactors are located after the water has been treated with filtration to remove turbidity that would interfere with disinfection. Turbidity is a measurement of the cloudiness of water, used as a surrogate measurement indicating the potential presence of pathogens. Water higher in turbidity is less safe than water with low turbidity.

The commission adopts new §290.42(g)(5)(B) to incorporate the criteria of 40 CFR §141.720(d)(2) that UV light reactors can only receive microbiological treatment credit if approved by the executive director based on validation testing that must be conducted in accordance with criteria established by EPA and the executive director.

The commission adopts new §290.42(g)(5)(B)(i) to incorporate the criteria of 40 CFR §141.720(d)(2)(i) that UV light reactors can only receive microbiological treatment credit if the validation testing addresses the impact of UV absorbance, lamp fouling, lamp aging, on-line sensor uncertainty, hydraulic turbulence factors, effect of critical failures, piping configuration, lamp and sensor locations, and any other data deemed necessary by the executive director.

The commission adopts new §290.42(g)(5)(B)(ii) to incorporate the criteria of 40 CFR §141.720(d)(2)(ii) that UV light reactors can only receive microbiological treatment credit if the validation testing is performed on a UV light reactor that is essentially identical to the UV light reactor that will be used by the public water system and that the water used in the validation testing is essentially identical to the water used by the system.

The commission adopts new §290.42(g)(5)(C) to incorporate the requirement of the federal LT2 in 40 CFR §141.720(d)(3)(i) that a UV light reactor system can only receive microbiological treatment credit if it is designed to conduct and record parameters to determine if the reactors are operating within the validated conditions approved by the executive director.

Section 290.44, Water Distribution, contains the design requirements for drinking water distribution systems. The commission adopts §290.44(h)(4)(A) to change the words "professional certification" to "license." All previously issued backflow prevention assembly tester certificates expired December 1, 2002. This certification was replaced by licensing in 30 TAC §30.51(c).

Section 290.45, Minimum Water System Capacity Requirements, contains the minimum water system capacity requirements. The commission adopts §290.45(c)(1)(B)(ii) to correct the typographical error of "gpm" to gallons per unit.

The commission adopts the figure, Table A, in §290.45(d)(1) to correct the units for capacity by adding the phrase "/Day."

Section 290.46, Minimum Acceptable Operating Practices for Public Drinking Water Systems, contains the minimum acceptable operating requirements for public water systems, for example, record retention periods. In response to comment, the commission has changed §290.46 to be consistent with the federal requirements.

The commission adopts §290.46(e)(2)(C) to eliminate the date because the effective date of the regulation change has passed.

The commission adopts §290.46(f)(3)(B)(iv) to change the title of §290.111 to be consistent with the adopted name change for that section.

The commission adopts new §290.46(f)(3)(B)(vii) to incorporate the requirement of the federal LT2 in 40 CFR §141.722(a) that raw surface water monitoring results be kept for three years after bin classification. Bin classification is the process under the federal LT2 whereby the executive director establishes the level of microbial inactivation that is required at individual water treatment plants treating surface water or groundwater under the direct influence of surface water.

The commission adopts new §290.46(f)(3)(B)(viii) to incorporate the requirement of the federal LT2 in 40 CFR §141.722(b) that public water systems retain records related to system notification to the executive director of treatment in lieu of monitoring for three years.

The commission adopts new §290.46(f)(3)(B)(ix) to incorporate the requirement of the federal LT2 in 40 CFR §141.722(c) that public water systems retain records of all surface water treatment monitoring that is used to determine log inactivation or removal for three years. In response to comment, the commission amended §290.46(f)(3)(B)(ix) to differentiate the microbial toolbox records from the CFE and IFE turbidity monitoring records.

In response to comment, the commission changed §290.46 to conform with 40 CFR §141.33(f) by moving the requirement for monitoring plans from §290.46(f)(3)(D)(iv), which lists records that must be kept for five years, to §290.46(f)(3)(E)(ix), which lists records that must be kept for ten years, to be consistent with the federal requirements. Because of this deletion, the commission renumbered the subsequent clauses.

The commission adopts new §290.46(f)(3)(D)(v) to incorporate the requirement of the federal GWR in 40 CFR §141.405(b)(3) that all corrective action plans and schedules for groundwater systems be kept by the public water system for five years.

The commission adopts new §290.46(f)(3)(D)(vi) to incorporate the requirement of the federal GWR in 40 CFR §141.405(b)(3) that all documentation of the reason for an invalidated fecal indicator source sample be kept by the public water system for five years.

The commission adopts new §290.46(f)(3)(D)(vii) to incorporate the requirement of the federal GWR in 40 CFR §141.405(b)(4) that all notifications to wholesale systems due to coliform positive samples be kept by the public water system for five years.

The commission adopts new §290.46(f)(3)(D)(viii) to incorporate the requirement of existing 40 CFR §141.153 that all consumer confidence report compliance documentation be kept for five years, consistent with the organization of record retention requirements. Record retention requirements for reports required by the drinking water standards of Subchapter F are contained in §290.46(f) as part of the minimum operating requirements for public water systems.

The commission adopts new §290.46(f)(3)(E)(v) to incorporate the requirement of the federal DBP2 in 40 CFR §141.601(c)(4) that Initial Distribution System Evaluation (IDSE) reports be kept by the public water system for ten years. In response to comment, the commission revised §290.46(f)(3)(E)(v) to include the retention time requirements for IDSE plan, report, approval letters, and other compliance documentation to conform with 40 CFR §141.601(a)(4).

The commission adopts new §290.46(f)(3)(E)(vi) to incorporate the requirement of the federal DBP2 in 40 CFR §141.601(c)(4) that any notification of modifications to an IDSE report be kept by the public water system for ten years.

The commission adopts new §290.46(f)(3)(E)(vii) to incorporate the requirement of the federal DBP2 in 40 CFR §141.601(b)(4) that 40/30 certifications be kept by the public water system for ten years.

The commission adopts new §290.46(f)(3)(E)(viii) to incorporate the requirement of the federal GWR in 40 CFR §141.405(b)(1) that documentation of corrective actions be kept by the public water system for ten years.

In response to comment, the commission moved the record retention requirements for monitoring plans required by §290.121(b) from §290.46(f)(3)(D)(iv) to §290.46(f)(3)(E)(ix). Because of this change, monitoring plans have to be kept for ten years instead of five years, to be consistent with the federal requirements of 40 CFR §141.33(f).

The commission adopts §290.46(g) to spell out the acronym for American Water Works Association at its first usage.

The commission adopts §290.46(j) by changing the name of §290.47(d) from "Customer Service Inspection Certificate" to "Appendices" to reflect the existing name of §290.47. Additionally, the commission includes the acronym for the Texas State Board of Plumbing Examiners in §290.46(j)(1)(A).

The commission adopts §290.46(j)(1)(B) to change the words "certification or endorsement" to "license." All previously issued customer service inspection endorsements expired. This endorsement was replaced by a license in existing §30.81(c).

The commission adopts §290.46(s) to incorporate requirements of the federal LT2 in 40 CFR §141.719(b) and 40 CFR §141.720(d) to include testing requirements for membrane systems and UV light.

The commission adopts §290.46(s)(2)(C) to differentiate between the existing requirements for chemical disinfectants and the new requirements of 40 CFR §141.720(d) for the use of UV light.

The commission adopts new §290.46(s)(2)(D) to include the requirements of 40 CFR §141.720(d)(3)(i) that UV light analyzers be properly calibrated.

The commission adopts new §290.46(s)(2)(D)(i) to include the requirements of 40 CFR §141.720(d)(3)(i) that duty UV sensors be verified with reference UV sensors monthly.

The commission adopts new §290.46(s)(2)(D)(ii) to include the requirements of 40 CFR §141.720(d)(3)(i) that reference UV sensors be calibrated yearly or sooner.

The commission adopts new §290.46(s)(2)(D)(iii) to include the requirements of 40 CFR §141.720(d)(3)(i) that UV transmittance sensors be calibrated weekly.

The commission adopts new §290.46(s)(2)(E) to include the requirements of the federal LT2 in 40 CFR §141.719 that systems must verify performance of direct integrity testing and equipment as approved by the executive director.

The commission adopts new §290.46(w) to incorporate the requirements of THSC §341.003(i) for systems to have a plan to notify the commission in case of an event that negatively impacts the production and delivery of safe and adequate drinking water. Paragraphs (1) - (5) describe emergency events that trigger notification.

Section 290.47, Appendices, contains the flow chart for systems to use in determining whether a boil water notice is needed when pressure in the distribution system drops.

The commission adopts the figure, Boil Water Notification, in §290.47(e) to update the TCEQ's phone number.

The commission adopts the figure, Service Agreement, in §290.47(f) to replace the term "calibration date" with the term "Date Tested for Accuracy" as stated in §290.44(h)(4)(B) and to add a line for the certified tester to sign the form as required by §290.44(h)(4)(C).

The commission adopts §290.47(h) to replace "TNRCC" with "TCEQ" in the graphic.

Subchapter F: Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements

Subchapter F contains the maximum contaminant levels (MCLs), treatment techniques, sampling frequencies and locations, and reporting requirements for drinking water quality as provided by the EPA under the Safe Drinking Water Act (SDWA) and its amendments.

Section 290.101, Purpose, states the purpose of the drinking water standards and other requirements contained in Subchapter F. The commission adopts §290.101 to correct typographical and syntax errors. As adopted, the periods after each letter in the acronym for United States Code are removed, the term "et seq." is italicized and the period after "et seq" is removed, and the acronym "EPA" is replaced with the full name of the United States Environmental Protection Agency.

Section 290.102, General Applicability, describes the conditions under which the drinking water standards apply to a water system. The commission adopts §290.102 to correct typographical and syntax errors. The commission adopts the catchline of §290.102(a) to eliminate the initial capital letter on the word "applicability." The commission corrects the reference to the Safe Drinking Water Act in §290.102(b) by replacing the existing word "Safety" with the word "Safe," and to insert the full name of the Code of Federal Regulations before referring to the acronym "CFR." The commission adopts §290.102(d) by adding the catchline "Motion to overturn" for consistency with Agency syntax protocols. The commission adopts the catchlines in §290.102(e) and (f) to eliminate the initial capital letters on words that are not first in the catchline for consistency with Agency syntax protocols.

Section 290.103, Definitions, contains definitions related to the drinking water standards and other requirements that are contained in Subchapter D.

The commission adopts §290.103 to add definitions resulting from the new federal GWR, LT2, and DBP2, to correct typographical and syntax errors, and to renumber existing definitions to accommodate the new definitions and to maintain alphabetical order. The definitions of §290.103 are for terms used throughout Subchapter F.

The commission adopts a definition of the term "assessment source monitoring" which is used in adopted §290.109 and §290.116 as new §290.103(1) consistent with the definition in the federal GWR in 40 CFR §141.402(b) and 30 TAC §290.109(c)(4)(E).

The commission adopts a definition given in the federal DBP2 and LT2 in 40 CFR §141.2 of the concept of a combined distribution system (CDS) group of systems as new §290.103(2) as, "A CDS is the interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive systems that receive finished water." The commission adopts new §290.103(2)(A) to state that a CDS may be modified to eliminate minor interconnections as provided in 40 CFR §141.620(c)(8). The commission adopts new §290.103(2)(B) to provide that the CDS determination for compliance with DBP2 and LT2 can be different for a single system. The LT2 method for determining CDS based on treatment plants is adopted as new §290.103(2)(B)(i) consistent with the federal LT2 in 40 CFR §141.701. The commission adopts the DBP2 method for basing CDS on retail population served as new §290.103(2)(B)(ii) consistent with the federal DBP2 in 40 CFR §141.600(b).

The commission adopts a definition modified from the federal DBP2 in 40 CFR §141.2 of "consecutive system" to describe purchased water systems as new §290.103(6). In response to comment, the

commission has removed the sentence containing the reference to "direct connection" from this definition. Also in response to comment, the commission added the phrase "other public water" and removed the word "wholesale."

The commission adopts a reference to *Cryptosporidium* and italicizes the term "*Giardia lamblia*" within the definition of "disinfection profile" in existing §290.103(4), renumbered to §290.103(7).

The commission adopts the definition of "dual sample set" as a pair of trihalomethane and haloacetic acid samples in accordance with the federal DBP2 in 40 CFR §141.2 as new §290.103(10).

The commission adopts the definition of "fecal indicators" from the federal GWR in 40 CFR §141.402(c)(2) as new §290.103(15).

The commission adopts the definition of "finished water" as new §290.103(18) consistent with the definition of "uncovered finished water reservoir" in the federal LT2 in 40 CFR §141.2.

The commission adopts the corrective action required in response to confirmed fecal contamination of groundwater as "groundwater corrective action" in new §290.103(19), consistent with the requirements of new §290.116 and the federal GWR in 40 CFR §141.403.

The commission adopts the definition of "groundwater correction action plan" as the plan required for a system that must take corrective action in new §290.103(20), consistent with the federal GWR in 40 CFR §141.403(a)(4) and new §290.116(b).

The commission adopts a definition of "groundwater system" consistent with the federal GWR in 40 CFR §141.400(b) as new §290.103(21).

The commission adopts "hydrogeologic sensitivity assessments" for determination of groundwater sensitivity in new §290.103(24) as provided in the federal GWR in 40 CFR §141.400(c)(5).

The commission adopts the new compliance method of taking a locational running annual average (LRAA) from the federal DBP2 in 40 CFR §141.2 as "locational running annual average" in §290.103(25).

The commission adopts the term "operational evaluation level (OEL)" as described in the federal DBP2 in 40 CFR §141.626 in new §290.103(29). In response to comment, the language from §290.115(b)(2) has been included in the definition.

The commission adopts a definition for the term "raw water" as new §290.103(30) for consistency in designating raw water monitoring for surface water and groundwater under the new federal GWR and LT2.

The commission adopts new §290.103(31) to contain the definition of the term "raw groundwater source sampling" consistent with the federal GWR in 40 CFR §141.402 and existing §290.109(c)(4).

The commission adopts the term "triggered source water monitoring" in new §290.103(35) as described in the federal GWR in 40 CFR §141.402(a)(1) and existing §290.109(c)(4)(A).

In response to comment, the commission changed its proposed definition in §290.103(37) which defined "wholesale system" to delete the implication that only a public water system that treats source water for re-sale as potable water could be a wholesale system. Instead, a wholesale system can purchase potable water and resell it for subsequent distribution, or can sell raw, untreated water on a wholesale basis. In either case, rules for wholesalers apply, so the definition was made more general.

Section 290.104, Summary of Maximum Contaminant Levels, Maximum Residual Disinfection Levels, Treatment Techniques, and Action Levels, contains a summary of MCLs, maximum residual disinfectant levels, treatment techniques, and action levels for drinking water. This summary consolidates the limits that are spread through the individual sections relating to specific contaminants.

The commission adopts §290.104 to add references to requirements added elsewhere as part of the incorporation of new federal requirements, remove references to effective dates that have passed, to correct internal references, and to correct typographical and syntax errors.

The commission adopts the table in §290.104(b) to remove references to the existing arsenic MCL effective date of January 23, 2006, because that date has passed.

The commission adopts the internal reference in §290.104(g) because the title of §290.111 is changed to "Surface Water Treatment" as a result of LT2. In §290.104(g)(1) the commission removes the initial

capital letters from the term "Nephelometric Turbidity Unit." The commission adopts §290.104(g)(2) to conform to the new contents of §290.111, which is changed as a result of the incorporation of LT2.

The commission adopts §290.104(i) to change the internal reference to §290.113, and to add a reference to §290.115. Both changes result from the adopted revisions resulting from incorporation of DBP2.

Section 290.106, Inorganic Contaminants, contains the health-based standards, sampling requirements, reporting requirements, and public notification requirements for inorganic contaminants that may be found in drinking water sources.

The commission adopts §290.106 to include elements related to the PNR, to remove references to effective dates that have passed, to correct citations, and to correct typographical and syntax errors.

The commission deletes §290.106(a)(4) to remove references to the existing arsenic MCL effective date of January 23, 2006, because that date has passed and the commission adopts the table in §290.106(b) for the same reason.

The commission adopts new §290.106(f)(8) is adopted to explicitly identify the type of violation resulting from failure to perform a required public notification. The change is necessary for consistency with PNR requirements specified in publication EPA 816-R-01-010, Final State Implementation Guidance for the Public Notification (PN) Rule, to accommodate internal agency procedures for identifying violations by specific citations in the Consolidated Compliance and Enforcement Data System (CCEDS), and thus to ensure delivery of public notice violation data to EPA as part of the TCEQ's primacy requirements.

The commission adopts §290.106(g)(1) to conform to the requirement under the federal PNR of 40 CFR §141.602 requiring a system to notify the public of a nitrate violation within 24 hours, replacing the existing reference allowing this notification to occur on the next business day.

Section 290.107, Organic Contaminants, contains the health-based standards, sampling requirements, reporting requirements, and public notification requirements for synthetic and naturally occurring organic contaminants that may be found in drinking water sources.

The commission adopts §290.107 to eliminate a reference to a past compliance date, to include elements of the PNR, to correct references, and to correct typographical and syntax errors.

The commission deletes the catchline in §290.107(c)(2)(A)(i) to conform to agency syntax protocols.

The commission adopts §290.107(c)(2)(C)(ii) to remove the December 31, 1992 effective date, because all public water systems have completed initial compliance monitoring since that time.

The commission adopts §290.107(e) to correct the agency's address to conform to United States Postal Service requirements.

The commission adopts new §290.107(f)(3) to explicitly identify the type of violation resulting from failure to perform a required public notification for consistency with EPA's Public Notification Rule

requirements specified in publication EPA 816-R-01-010, Final State Implementation Guidance for the Public Notification (PN) Rule.

Section 290.108, Radionuclides Other than Radon, contains the health-based standards, sampling requirements, reporting requirements, and public notification requirements for radiochemicals (other than radon) that may be found in drinking water sources.

The commission adopts §290.108 to eliminate compliance dates that have passed, to include elements of the PNR, and to correct typographical and syntax errors.

The commission adopts §290.108(a) to remove the reference to the December 8, 2003, effective date for the uranium MCL because that date has passed, and the reference to the December 31, 2007, effective date to complete initial uranium monitoring is because all systems in Texas have done initial monitoring.

The commission removes the uranium MCL effective date from §290.108(b)(1)(C). References to moot uranium monitoring effective dates are removed from §290.108(c)(1)(A)(iii), §290.108(c)(1)(A)(iii)(I), §290.108(c)(1)(A)(iii)(II) and §290.108(c)(1)(A)(iii)(III) because all required monitoring has been accomplished.

The commission adopts the TCEQ's mailing address in §290.108(e) to conform with United States Postal Service requirements.

The commission adopts new §290.108(f)(5) to explicitly identify the type of violation resulting from failure to perform a required public notification for consistency with PNR requirements specified in publication EPA 816-R-01-010, Final State Implementation Guidance for the Public Notification Rule (PN) Rule.

Existing §290.109, Microbial Contaminants, contains the health-based standards, sampling requirements, reporting requirements, and public notification requirements for microbial contaminants that may be found in drinking water. The existing section contains requirements from the federal TCR and is extensively amended to incorporate new elements of the federal GWR, because the GWR is intended to address microbial contamination of raw water sources. The commission changes the wording throughout §290.109 to make sampling references consistent.

The commission adopts §290.109(b) relating to MCLs for microbial contaminants to include the GWR treatment technique requirements under 40 CFR §141.403 which establish a standard for fecal microbial indicators for raw groundwater sources.

The commission adopts new §290.109(b)(1) to contain the existing MCL definitions for microbial contaminants in the distribution system in existing §290.109(b).

The commission adopts new §290.109(b)(1)(A) to incorporate existing §290.109(b)(1). The commission also adds the words "routine distribution" to specify that the samples this paragraph applies to are those routinely collected from the distribution system and to correct the MCL language as being achieved when more than 5% of samples collected in a month are coliform positive for a system that collects at least 40

routine distribution coliform samples, consistent with the federal Total Coliform Rule in 40 CFR §141.21. In response to comment, the commission removed the word "achieved" and replaced it with the words "defined as" in §290.109(b)(1)(A).

The commission adopts new §290.109(b)(1)(B) to incorporate existing §290.109(b)(2). The commission also adopts the words "routine distribution" to identify the samples referred to in these subparagraphs as those routinely collected from the distribution system. Additionally, the commission makes the MCL language consistent with the federal Total Coliform Rule in 40 CFR §141.21 as being achieved when more than 5% of samples collected in a month are coliform positive for a system that collects fewer than 40 routine distribution coliform samples. In response to comment, the commission removed the word "achieved" and replaced it with the words "defined as" in §290.109(b)(1)(B).

The commission adopts new §290.109(b)(1)(C) to identify the distribution coliform acute MCL which was not previously defined in §290.109(b). This change is to maintain consistency with the organization other of sections in Subchapter F, in which all MCLs are identified specifically in a single subsection. In response to comment, the commission removed the word "achieved" and replaced it with the words "defined as" in §290.109(b)(1)(C).

The commission adopts new §290.109(b)(2) to contain the non-detection standards for fecal indicators in raw groundwater sources as established in the GWR treatment technique requirements under 40 CFR §141.403.

The commission adopts §290.109(c) to include monitoring requirements of other fecal indicator organisms identified in the federal GWR in 40 CFR §141.402(c)(2). In addition, the commission adopts the term *E. coli* rather than *Escherichia coli* for consistency with the federal GWR in 40 CFR §141.402.

The commission adopts §290.109(c)(1)(A) to identify the routine samples referred to in this subparagraph specifically as distribution coliform samples rather than as any other type of bacteriological samples. Because the new federal rule initiates requirements for viral indicator sampling at raw sample sites as well as bacterial sampling at distribution sample sites, it is now necessary to make this distinction. The commission also adopts the word "quality" to clarify the aspects of the water that may impact sample site selection. In addition, the commission indicates that other sampling sites may be used only if adjacent to active service connections rather than potentially implying that any active or inactive service connections could be used.

The commission adopts §290.109(c)(1)(B), (c)(2), (c)(2)(A) - (c)(2)(D), (c)(2)(F), (c)(3), (c)(3)(A), (c)(3)(A)(i), (c)(3)(A)(ii), and (c)(3)(C) to specify and clarify that the sampling indicated in this subparagraph refers to distribution coliform samples rather than other microbial contaminants. The commission changes the wording throughout §290.109 to make sampling references consistent. Because the new federal rule requirements initiate requirements for microbiological contaminants other than coliform bacteria, it is now necessary to make this distinction.

The commission adopts new §290.109(c)(4) to incorporate the groundwater source monitoring requirements of the federal GWR in 40 CFR §141.402.

In new §290.109(c)(4)(A), the commission approves the use of *E. coli* as a fecal indicator for raw groundwater source monitoring required under the federal GWR in 40 CFR §141.402. In §290.109(c)(4)(A)(i) and (ii), the commission incorporates the requirements of 40 CFR §141.402(a)(1) which requires public water systems to conduct triggered source monitoring if they do not provide at least 4-log treatment of viruses and are notified of a distribution coliform positive. The term "4-log" treatment means that the technology used has the ability to remove at least 99.99% of viruses present in the raw source water.

The commission adopts new §290.109(c)(4)(B) to incorporate the raw source sampling requirements of the federal GWR in 40 CFR §141.402(a)(2). The new subparagraph requires drinking water systems using groundwater sources to take source samples within 24 hours of being notified of a distribution coliform sample positive. In new §290.109(c)(4)(B)(i) and (ii), the commission allows the extension of the 24-hour period and allows systems to sample a representative subset of groundwater sources if approved by the executive director. In new §290.109(c)(4)(B)(iii), the commission adopts the provisions under 40 CFR §141.402(a)(2)(iii) which allow systems serving fewer than 1,000 people to use the required raw source sample as one of the four required distribution repeat samples.

The commission adopts new §290.109(c)(4)(C) to incorporate the requirements under the federal GWR in 40 CFR §141.402(a)(4) that a system which purchases water from a groundwater system must notify the provider within 24 hours of a positive coliform distribution sample. In new §290.109(c)(4)(C)(i) and (ii), the commission adopts the requirements of 40 CFR §141.402(a)(4)(i) and (ii) which require wholesale systems to conduct raw source monitoring with 24 hours of being notified of the receiving system's

positive distribution sample. Additionally, the wholesaler must notify its receiving systems within 24 hours of being notified that a source sample was positive for a fecal indicator.

The commission adopts new §290.109(c)(4)(D) to incorporate the requirements under 40 CFR §141.402(a)(5) which allow the primacy agency to waive the triggered source monitoring requirements under circumstances identified in the federal GWR in 40 CFR §141.402(a)(5)(i) and (ii). The commission adopts new §290.109(c)(4)(D)(i) and (ii) to allow this waiver based on distribution system deficiencies that caused the distribution coliform positive and the collection of an invalid distribution sample.

The commission adopts new §290.109(c)(4)(E) to incorporate 40 CFR §141.402(b) which allows primacy agencies to conduct assessment source monitoring on groundwater sources deemed to be susceptible to fecal contamination, prior to positive distribution coliform samples.

The commission adopts §290.109(d) to contain the analytical invalidation requirements contained in existing §290.109(c)(4). This is consistent with the organizational principle that all analytical requirements for a contaminant are contained in a single subsection. In response to comment, the commission revised the catchline from "Analytical requirements for microbial contaminants" to "Analytical and invalidation requirements for microbial contaminants."

The commission adopts new §290.109(d)(1) to contain the sample invalidation text moved from existing §290.109(c)(4). In addition to moving that paragraph, the commission adopts §290.109(d)(1) to identify the term "sample" to specify "distribution coliform sample." This distinction is needed to differentiate the

invalidation requirements for raw groundwater source samples found in the adopted §290.109(d)(2) from the existing invalidation requirements for distribution coliform samples.

The commission adopts new §290.109(d)(1)(A) - (E) to contain the requirements existing §290.109(c)(4)(A) - (E) that require written notification from laboratories when improper sample analysis occurred in order to document that the improper analysis caused the positive result and give the executive director the discretion to invalidate a sample.

The commission adopts new §290.109(d)(2) to address fecal indicator positive source sample invalidation as allowed by the federal GWR in 40 CFR §141.402(d).

The commission adopts new §290.109(d)(2)(A) to incorporate the public water systems requirements in the event of a laboratory invalidation of a fecal indicator positive source samples as required by 40 CFR §141.402(d).

The commission adopts new §290.109(d)(2)(B) to provide the criteria under which invalidation of a fecal indicator positive source sample will be allowed as contained in the federal GWR in 40 CFR §141.402(d).

The commission adopts §290.109(e) to replace "Texas Natural Resource Conservation Commission" with "Texas Commission on Environmental Quality."

The commission adopts §290.109(f)(1)(A) to identify the repeat sample referred to as those collected in the distribution system. In addition, the commission uses the term *E. coli* rather than *Escherichia coli* for consistency with the federal GWR in 40 CFR §141.402.

The commission adopts §290.109(f)(1)(B) to identify the repeat and routine sample as those collected in the distribution system. In addition, the commission uses the term *E. coli* rather than *Escherichia coli* for consistency with 40 CFR §141.402.

The commission adopts §290.109(f)(2) to replace the term "bacteriological samples" with the term "routine distribution coliform samples." In addition, the commission uses the term *E. coli* rather than *Escherichia coli* for consistency with 40 CFR §141.402. Because the new federal rule requirements initiate requirements for microbiological contaminants other than coliform bacteria, it is now necessary to make this distinction.

The commission adopts §290.109(f)(3) to identify samples referred to as routine distribution coliform samples. Because the new federal rule requirements initiate requirements for microbiological contaminants other than coliform bacteria, it is now necessary to make this distinction. In addition, the commission uses the term *E. coli* rather than *Escherichia coli* for consistency with 40 CFR §141.402.

The commission adopts a new §290.109(f)(4) to contain the non-detection standards for fecal indicators in raw groundwater sources as established in the GWR treatment technique requirements under 40 CFR §141.403.

The commission renumbers existing §290.109(f)(4) to §290.109(f)(5) and further identifies the coliform samples referred to in this paragraph as distribution coliform samples. Because the new federal rule requirements initiate requirements for microbiological contaminants other than coliform bacteria, it is now necessary to make this distinction.

The commission adopts new §290.109(f)(6) to specify that failure to collect the required number of raw source samples will result in a monitoring violation as defined under the federal GWR in 40 CFR §141.402(h).

The commission renumbers existing §290.109(f)(5) to §290.109(f)(7) in order to retain the correct numbering sequence after inserting additional paragraphs resulting from the federal GWR.

The commission adopts new §290.109(f)(8) to specify that failure to issue public notice or certify that public notice has been performed will result in a public notice violation consistent with EPA 816-R-01-010, Final State Implementation Guidance for the Public Notification (PN) Rule.

The commission renumbers existing §290.109(f)(6) to §290.109(f)(9) and to identify the routine and repeat samples referred to in this paragraph as distribution coliform samples. The new federal GWR initiates requirements for microbiological contaminants other than coliform bacteria, so it is now necessary to make this distinction.

The commission renumbers existing §290.109(f)(7) to §290.109(f)(10) and to identify the samples referred to in this paragraph as distribution coliform samples. Because the new federal rule requirements

initiate requirements for microbiological contaminants other than coliform bacteria, it is now necessary to make this distinction.

The commission renumbers existing §290.109(f)(8) to §290.109(f)(11) in order to retain the correct numbering sequence after inserting additional paragraphs resulting from the federal GWR.

The commission adopts §290.109(g)(1) to further identify the requirements as boil water notice requirements of Subchapter D and correct the incorrect internal reference from §290.46(s)(3) to §290.46(q).

The commission adopts new §290.109(g)(2) to require public notice of fecal indicator positive source samples in accordance with §290.122(a)(1)(F) of this title and the requirements of the federal GWR in 40 CFR §141.202(a)(8). In response to comment, the commission removed the word "valid" and added the phrase "that has not been invalidated." Also in response to comment, the commission specified that the notice must be issued within 24 hours.

Existing §290.110, Disinfectant Residuals, contains the requirements for maintaining disinfectant residuals in drinking water distribution systems and in surface water treatment plants. This section is extensively amended in response to the federal LT2, which adds complexity to the requirements for surface water treatment plants. In order to simplify and clarify the requirements, the existing requirements for surface water treatment plants are moved to §290.111 with requirements from the federal LT2. Section 290.110 is therefore amended to contain only the requirements for disinfectant residuals in drinking water distribution systems. The adopted amendments will also establish an alternate analytical

method for chlorine dioxide which will allow public water systems to use this method should they so choose, allowing greater flexibility for the regulated community. Finally, the adopted amendment will specify that failure to issue public notice or certify that public notice has been performed will result in a public notice violation.

In §290.110(b), the commission deletes a reference to treatment technique requirements that apply only to systems treating surface water or groundwater under the direct influence of surface water because all of the conditions for surface water treatment (and treatment of groundwater under the direct influence of surface water) are moved to the new section containing all of the requirements for surface water treatment plants (and plants treating groundwater under the direct influence of surface water) in §290.111, relating to Surface Water Treatment. Throughout Chapter 290, and in the federal SDWA, the requirements for treatment of groundwater under the direct influence of surface water are identical to the requirements for treatment of surface water, except where specific differences are explicitly noted.

The commission adopts the amendment to §290.110(b)(1) which replaces the specific requirement with a general requirement that public water systems ensure that water is adequately disinfected before entering the distribution system. The commission moves the specific treatment technique requirements currently contained in §290.110(b)(1) to §290.111(c).

The commission adopts §290.110(b)(1)(A) to reference the section of the adopted rules that will contain the disinfection (pathogen inactivation) requirements for systems treating surface water or groundwater under the direct influence of surface water. The commission adopts §290.110(b)(1)(B) to reference the

adopted section that contains the analogous requirements for systems treating groundwater. The specific requirements currently contained in these two subparagraphs are moved to §290.111(d)(1).

The commission deletes §290.110(b)(5)(A) and (B), which are no longer needed because the effective date of the regulatory change has passed.

The commission moves the requirements contained in existing §290.110(c)(1) to adopted new §290.111(d)(2). The commission moves the requirements contained in existing §290.110(c)(1)(A) - (C) to adopted new §290.111(d)(2)(A) - (C), respectively. The commission renumbers the remaining paragraphs in §290.110(c) accordingly.

The commission moves the analytical requirements currently contained in §290.110(d)(1) and (2) to §290.111(d)(4)(A) and (B), respectively. As a result, the remaining paragraphs in this subsection are renumbered accordingly.

In addition to renumbering §290.110(d)(5) to §290.110(d)(3), the adopted amendment would also allow the use of additional analytical methods for chlorine dioxide described in 40 CFR §141.75. New §290.110(d)(3)(A) contains the method in existing §290.110(d)(5).

The commission adopts §290.110(e) to allow the commission to comply with minimum federal requirements, update and correct references contained in existing provisions, and reduce the reporting requirements for transient, noncommunity systems that only treat groundwater or distribute treated water purchased from another public water system.

The commission adopts §290.110(e)(1) to require public water systems with a chlorine dioxide maximum residual disinfection level (MRDL) violation to notify the executive director within 24 hours instead of by the end of the next business day. This adopted change is needed to assure compliance with the requirements of the federal PNR in 40 CFR §141.202(a)(5) and (b)(2).

The commission adopts §290.110(e)(2) to eliminate a reference to an effective date which has already passed and identify the current reporting forms used by plants treating surface water and groundwater under the direct influence of surface water.

The commission adopts the amendment to §290.110(e)(4) which eliminates a reference to an effective date which has passed and which identifies the form number of the Disinfectant Level Quarterly Operating Report (DLQOR) that must be completed by plants that treat groundwater or distribute treated water purchased from another public water system. The commission also replaces the word "submit" with the word "complete" because the commission is reducing the reporting requirements for transient noncommunity water systems. The commission adopts new §290.110(e)(4)(A) and (B) to retain the existing reporting requirement for community and nontransient noncommunity systems but only require transient noncommunity water systems provide a copy of the DLQOR if one is requested by the executive director consistent with the applicability of existing 40 CFR §141.130(a)(1).

The commission adopts §290.110(e)(5) to correct the errors in the mailing address of the TCEQ's Water Supply Division for consistency with United States Postal Service standards and to replace "Texas Natural Resource Conservation Commission" with "Texas Commission on Environmental Quality."

The commission adopts the amendments to the references in §290.110(f)(4) and (5)(B) due to reorganization.

The commission adopts a change to §290.110(f)(5)(C) to correct a grammatical error by changing "an" to "a" when referring to a nonacute MRDL violation for chlorine dioxide.

The commission adopts new §290.110(f)(10) to comply with directives received from the EPA and contained in their publication EPA 816-R-01-010, Final State Implementation Guidance for the Public Notification (PN) Rule.

The commission adopts §290.110(g)(1) to resolve inconsistencies between state and federal regulations and delete a redundant sentence. The adopted rule requires a water system with an MRDL violation for chlorine dioxide to consult with the executive director within 24 hours rather than notify the executive director by the end of the next business day, consistent with the requirements of the federal PNR in 40 CFR §141.202(a)(5) and (b)(2). The adopted amendment to §290.110(g)(1) will also eliminate redundant verbiage more appropriately contained solely in §290.110(g).

The commission adopts §290.110(g)(2) to update citations that changed as a result of moving the requirement currently in §290.110(b)(1) to §290.111(d)(1)(D).

The commission repeals existing §290.111 and replaces it with a new §290.111 to incorporate new federal rule requirements, to relocate some of the requirements currently contained in §290.110 into this section, and to amend several of the existing provisions.

Existing §290.111, Turbidity, contains the turbidity requirements for surface water treatment plants; turbidity is a surrogate for possible microbial contamination. All of the conditions for surface water treatment (and treatment of groundwater under the direct influence of surface water) are moved to the new section containing all of the requirements for surface water treatment plants (and plants treating groundwater under the direct influence of surface water). Throughout Chapter 290, and in the federal SDWA, the requirements for treatment of groundwater under the direct influence of surface water are identical to the requirements for treatment of surface water, except where specific differences are explicitly noted. The new federal LT2 increases the disinfection requirements for surface water treatment plants, and also ties disinfection requirements to levels of turbidity or microbes in the source water. Therefore, the new §290.111 brings all of these requirements for surface water treatment plants together in one section. The commission also changes the name of §290.111 from "Turbidity" to "Surface Water Treatment" to more accurately reflect what is contained in this section.

The adopted new §290.111 will continue to contain requirements that only apply to plants treating surface water or groundwater that is under the direct influence of surface water. In addition, the new section will incorporate new requirements regarding raw surface water monitoring; move and amend the existing overall treatment technique requirements for viruses, *Giardia lamblia*, and *Cryptosporidium parvum*; relocate and amend the existing disinfection and inactivation requirements for these pathogens; update the existing turbidity requirements for plants using conventional filters; contain new performance

requirements for unconventional filters such as cartridge and membrane filters; identify new treatment credits that plants providing enhanced treatment can receive; and relocate and amend the existing requirements related to monitoring and reporting, compliance determinations, and public notification.

The commission adopts new §290.111(a) to identify the types of public water systems that are subject to the requirements of this adopted section. The adopted requirement is currently contained in existing §290.111(a). In new §290.111(a)(1) - (3), the commission adopts implementation schedules for systems treating surface water, groundwater under the direct influence of surface water, or a combination of these sources. The adopted implementation schedules are consistent with the requirements of the federal LT2 in 40 CFR §141.73 and related federal regulations.

The commission adopts new §290.111(b) to incorporate the raw surface water monitoring requirements contained in the federal LT2 in 40 CFR §141.700(c)(1) to require a system treating surface water or groundwater under the direct influence of surface water to conduct two rounds of special monitoring to determine site-specific minimum treatment technique requirements for *Cryptosporidium parvum* and other pathogens. Adopted §290.111(b) would allow the executive director to waive the monitoring requirements for systems that meet the maximum treatment technique requirements imposed by the federal rule, in accordance with the federal LT2 in 40 CFR §141.701(d).

The commission adopts new §290.111(b)(1) to establish the mechanism that the commission adopts to use to ensure that raw surface water monitoring plans comply with the requirements of the federal LT2 in 40 CFR §141.701 and §141.702(a).

The commission adopts new §290.111(b)(2) to incorporate the raw water sampling location requirements of the federal LT2 in 40 CFR §141.703.

The commission adopts new §290.111(b)(3) to address several requirements contained within LT2. The adopted new §290.111(b)(3)(A) - (C) incorporates the requirements of 40 CFR §141.700(b)(1) and §141.701(a)(1). The commission adopts new §290.111(b)(3)(A)(i) and (ii) to provide the population or combined distribution system basis for scheduling raw surface water *Cryptosporidium* sampling consistent with the federal LT2 in 40 CFR §141.700(b)(1). The commission adopts new §290.111(b)(3)(B) to address the requirements of 40 CFR §141.701(a)(3) and (a)(4). Adopted new §290.111(b)(3)(B)(i) - (iii) contains the LT2 basis for *Cryptosporidium* sampling at small systems with elevated *E. coli* levels. In response to comment, the commission changed the language of §290.111(b)(3)(B)(i) and (ii) to add a provision that would allow a system using a GUI source nearest to a river or flowing stream to only have to conduct *Cryptosporidium* sampling if the *E. coli* levels found exceed the levels for a source water intake on a river or flowing stream. This change allows systems using GUI sources all the options available in 40 CFR §141.701(a)(4)(iv). In response to comment, the commission removed the requirement for turbidity monitoring in §290.111(b)(3)(B) and turbidity and *E. coli* monitoring in §290.111(b)(3)(B)(iii) to assure that the commissions rules are no more stringent than the federal rules. The adopted §290.111(b)(3)(C) gives the executive director the latitude needed to implement 40 CFR §141.701(e).

The commission adopts new §290.111(b)(4) to address the raw water sample scheduling requirements of the federal LT2 in 40 CFR §141.701(c) and (f) and §141.702(b) and (b)(1). In response to comment, the commission adopts new Figure: 30 TAC §290.111(b)(4)(A) to contain the sampling schedules prescribed

by 40 CFR §141.701(c) and new §290.111(b)(4)(A) to address the sampling schedule for new sources using the process prescribed in 40 CFR §141.701(c). As a result of these additions, the commission has renumbered the remaining paragraphs in new §290.111(b)(4). New §290.111(b)(4)(C) contains the requirement that samples be collected within two days before or after the date approved by the executive director and new §290.111(b)(4)(D) contains the requirement that if a system fails to collect the sample within that period, they must explain why in writing.

The commission adopts new §290.111(b)(5) to consolidate and define an implementation approach for meeting the requirements of the federal LT2 in 40 CFR §141.702(b)(2) and (c).

The commission adopts new §290.111(b)(6) to incorporate the analytical requirements of the federal LT2 in 40 CFR §141.704 and §141.705. The commission adopts new §290.111(b)(6)(A) and (B) to contain the analytical requirements for raw water *Cryptosporidium* and *E. coli*, respectively. The commission adopts new §290.111(b)(6)(B)(i) - (iii) to contain details for approved sample collection requirements of the federal LT2 in 40 CFR §141.705. The commission adopts new §290.111(b)(6)(C) to contain the analytical requirement that turbidity be analyzed at a laboratory approved by the executive director.

The commission adopts new §290.111(b)(7) to address the reporting requirements of 40 CFR §141.706 and to facilitate implementation of the regulatory approach of adopted new §290.111(b)(5). Adopted §290.111(b)(7)(A) requires systems to use the commission form 20358 for reporting raw surface sample results. Adopted new §290.111(b)(7)(A)(i) requires systems to explain in writing if they miss a required sample period. Adopted new §290.111(b)(7)(A)(ii) requires that if the lab could not obtain a valid analytical result from the sample, that the system submit a request to collect a replacement sample to the

executive director, consistent with the federal LT2 requirements of 40 CFR §141.706. The commission adopts new §290.111(b)(7)(B) to contain the reporting deadline, consistent with 40 CFR §141.706, and subsection (b)(7)(C), to contain the mailing address for reports consistent with existing §290.111(e)(7).

The commission adopts new §290.111(c) to implement the requirements of the federal LT2 in 40 CFR §§141.170(a) and (a)(1), 141.500(a)(1), 141.700(c)(3) and (5), 141.710, 141.711, and 141.713.

The commission adopts new §290.111(c)(1) and (2) to contain the *Giardia lamblia* and viral treatment technique requirements in existing §290.111(b)(1).

The commission adopts new §290.111(c)(3) to incorporate the treatment technique requirements for *Cryptosporidium parvum*. Adopted new §290.111(c)(3)(A) - (C) will incorporate new requirements imposed by various paragraphs in 40 CFR §§141.710, 141.711, and 141.713. The word "*Cryptosporidium*" was spelled incorrectly in §290.111(c)(3)(A). The commission has corrected the spelling. The commission adopts Figure 30 TAC §290.111(c)(3)(B), Treatment Technique Requirements for *Cryptosporidium*, to present the information in a clear and organized manner. The commission made a non-substantive revision to the statutory citation in the preceding sentence by changing the lower case "b" to an upper case "B." In response to comment, the commission also adopts §290.111(c)(3)(A)(i) - (v), to explicitly address the compliance calculation methods contained in 40 CFR §141.710(b), and §290.111(c)(3)(B)(i) - (iii), to address the specific compliance schedule requirements of 40 CFR §141.713(a) and 40 CFR §141.713(c) and the analogous requirements for new raw surface water sources. In response to comment, the commission amends Figure: 30 TAC §290.111(c)(3)(B) for the following minimum treatment technique requirements: Bin 1 from 22.0-log to 2.0-log; Bin 2 from 44.0-log to 4.0-

log; Bin 3 from 55.0-log to 5.0-log; and, Bin 4 from 55.5-log to 5.5-log, as was originally intended by the commission. In response to comment, the commission amends Figure: 30 TAC §290.111(c)(3)(B) to replace the heading "Minimum Treatment Technique Requirement" with the heading "Minimum Removal/Inactivation Requirement" and included in the footnote an explicit statement of the *Cryptosporidium* removal credits that will be assigned to various treatment technologies. In response to comment, the commission adopts new Figure: 30 TAC §290.111(c)(3)(B)(i) to explain the compliance timetable for meeting the new treatment technique requirement and address the requirements of 40 CFR §141.713(a) and (c) and the analogous requirements for new raw surface water sources. The commission adopts new §290.111(c)(3)(D) will contain the *Cryptosporidium parvum* requirement currently in §290.111(b)(1).

The commission adopts §290.111(c)(4) to incorporate a *Cryptosporidium* treatment technique requirement for sources that receive a raw surface water source monitoring waiver under adopted §290.111(b).

The commission adopts new §290.111(c)(5) to contain treatment technique requirements moved from existing §290.110(b)(1) and §290.111(b)(1).

The commission adopts new §290.111(c)(6) to authorize the executive director to establish requirements for watershed control and treatment processes that are used to meet LT2 treatment technique requirements for waterborne pathogens. This adoption provides the executive director with the means to comply with the special primacy requirements of 40 CFR §142.16(n) and to ensure that a water system meets the applicable requirements of the federal LT2 in 40 CFR §141.721(f).

The commission adopts new §290.111(d)(1) to move the requirements currently in various parts of existing §290.110, to provide some additional treatment options from LT2, and to incorporate provisions of the federal rule. Specifically, the commission adopts new §290.111(d)(1)(A) and (B) to contain the requirements of existing §290.110(b)(1) and existing §290.111(b)(1). The commission adopts Figure: 30 TAC §290.111(d)(1), Microbial Inactivation Requirements, to present the information in a clear and organized manner.

The commission adopts new §290.111(d)(1)(C) to allow the executive to director to reduce the inactivation requirements for plants that are assigned to Bin 1 that are meeting enhanced performance standards at the effluent of each individual filter. The term "Bin" refers to the required level of microbial removal and inactivation at a surface water treatment plant (or plant treating groundwater under the direct influence of surface water). There are four possible Bin classifications: Bin 1, Bin 2, Bin 3, and Bin 4. The higher the Bin number, the higher the level of treatment that must be provided. The commission limits this additional removal credit to plants assigned to Bin 1 because plants assigned to Bins 2 - 4 have a higher source water pathogen concentration and it would therefore be inappropriate for such plants to reduce the level of protection provided by the disinfection process.

The commission adopts new §290.111(d)(1)(D) to incorporate the existing §290.110(f)(4) that a system which fails to meet the inactivation requirements for a four-hour period commits a treatment technique violation.

The commission adopts new §290.111(d)(1)(E) to incorporate the requirements of the federal LT2 in 40 CFR §141.720(d)(3)(ii). Due to a publication error, the word "inactivation" was misspelled in the proposal. The word has been correctly spelled and the rule is adopted with this change.

The commission adopts new §290.111(d)(2) to contain the requirements for in-plant monitoring related to the effectiveness of disinfection moved from existing §290.110(c)(1).

The commission adopts new §290.111(d)(2)(A) to contain the requirements for monitoring pH, temperature, and flow moved from §290.110(c)(1)(A).

The commission adopts new §290.111(d)(2)(B) to contain the requirements for determining contact time moved from §290.110(c)(1)(B).

The commission adopts new §290.111(d)(2)(C) to contain the requirements for retesting when inactivation fails to meet the inactivation requirements moved from §290.110(c)(1)(C).

The commission adopts new §290.111(d)(3) to contain monitoring requirements imposed by the federal LT2 in 40 CFR §141.720(d)(3) for systems using UV to meet the inactivation requirements of this adopted subsection.

The commission adopts new §290.111(d)(3)(A) to contain the requirement for monitoring UV intensity, lamp status and flow imposed by the federal LT2 in 40 CFR §141.720(d)(3).

The commission adopts new §290.111(d)(3)(B) to contain the requirements for plants in Bins 2, 3, or 4 to also monitor the volume of water treated in accordance with the federal LT2 in 40 CFR §141.720(d)(3).

The commission adopts new §290.111(d)(4) to relocate or copy many of the requirements currently contained §290.110(d), to allow the use of a new analytical method for chlorine dioxide, and to identify the approved method for measuring ozone concentrations.

The adopted new §290.111(d)(4)(A) and (B) contain the requirements for pH analysis and temperature measurement consistent with existing §290.110(d)(1) and (2), respectively.

The commission adopts new §290.111(d)(4)(C) to contain the requirements for in-plant free chlorine monitoring moved from existing §290.110(d)(3), except that the reference to color comparator methods has been intentionally omitted. The comparator methods are less precise and yield more subjective results. Consequently, they should not be used to quantify the level of inactivation achieved by the disinfection process.

The commission adopts new §290.111(d)(4)(C)(i) - (iv) to contain the requirements for amperometric, DPD Ferrous, DPD photometric, and springaldizine methods to measure free chlorine moved from existing §290.110(d)(3)(A), (B), (C)(i), and (D), respectively.

The commission adopts new §290.111(d)(4)(D) to contain the requirements for in-plant chloramine monitoring moved from existing §290.110(d)(3), except that the reference to color comparators methods

has been intentionally omitted. Color comparators accuracy is inadequate to quantify the level of inactivation achieved by the disinfection process.

The commission adopts new §290.111(d)(4)(D)(i) - (iii) to contain the requirements for in-plant chloramine monitoring moved from existing §290.110(d)(4)(A), (B), and (C)(i), respectively.

The commission adopts new §290.111(d)(4)(E) to contain the requirements for in-plant chlorine dioxide monitoring of existing §290.110(d)(5).

The commission adopts new §290.111(d)(4)(E)(i) to contain the amperometric method currently approved in the existing §290.110(d)(5)(A) and adopts §290.111(d)(4)(E)(ii) to contain a reference to the new Lissamine Green method also adopted in new §290.110(d)(3)(B).

The commission adopts new §290.111(d)(4)(F) to reference the EPA-approved Indigo Method for measuring ozone residuals.

The commission adopts new §290.111(d)(4)(G) to contain the analytical requirements for UV of the federal LT2 in 40 CFR §141.720(d)(3)(i).

The commission adopts new §290.111(e) to contain the treatment technique requirements for turbidity currently contained in §290.111(b). Adopted new §290.111(e) addresses all of the treatment techniques, performance criteria, monitoring requirements, special investigation requirements, and analytical methods related to turbidity monitoring at plants using conventional filters. These requirements are currently

contained in §290.111(b) - (d) and are reorganized and updated to remove references to the implementation timelines for provisions that have already become effective.

The commission adopts new §290.111(e)(1) to contain the combined filter effluent (CFE) turbidity standards of existing §290.111(b)(1). The commission adopts new §290.111(e)(1)(A) to contain the existing requirement of §290.111(b)(1)(A) and adopts new §290.111(e)(1)(B) to contain the existing requirement of §290.111(b)(1)(B). The provisions of existing §290.111(b)(1)(C) are not transferred because the effective date of this provision has passed.

The commission adopts new §290.111(e)(2) to contain the individual filter effluent turbidity (IFE) standards that currently exist in §290.111(b)(2). The commission adopts new §290.111(e)(2)(A) to contain the requirements currently contained in §290.111(b)(2)(B) and (C). The commission merges the requirements currently contained in §290.111(b)(2)(B) and (C) and move them to adopted §290.111(e)(2)(A) since the effective date for small systems has passed. The commission adopts new §290.111(e)(2)(B) to contain the requirements of existing §290.111(b)(2)(A).

The commission adopts new §290.111(e)(3) to contain the routine turbidity monitoring requirements currently contained in §290.111(c). The adopted new §290.111(e)(3)(A) contains the CFE requirements of existing §290.111(c)(1)(A) and the adopted new §290.111(e)(3)(B) contains the CFE requirements of existing §290.111(c)(2)(A).

Adopted new §290.111(e)(3)(C) contains the IFE monitoring requirements currently contained in existing §290.111(c)(3) and (4)(A).

The commission adopts new §290.111(e)(3)(D) to relocate the CFE and IFE monitoring requirements for plants that continuously monitor CFE in lieu of IFE from existing §290.111(c)(1)(B), (2)(B), and (4)(B) to adopted new §290.111(e)(3)(D).

The commission adopts new §290.111(e)(3)(D)(i) to contain the requirements for CFE monitoring from existing §290.111(c)(1)(B).

The commission adopts new §290.111(e)(3)(D)(ii) to contain the requirements for IFE monitoring from existing §290.111(c)(1)(C).

The commission deletes the provisions equivalent to those currently contained in §290.111(c)(1)(C), (2)(C), or (4)(C) because the effective dates of these existing provisions have passed.

The commission adopts new §290.111(e)(4) to contain the special monitoring requirements currently contained in §290.111(c)(5) - (7).

The commission adopts new §290.111(e)(4)(A) to contain the special monitoring requirements of existing §290.111(c)(5) and (6), merging the requirements for large and small plants, since all plants are subject to the same requirements now.

The commission adopts new §290.111(e)(4)(A)(i) to contain the filter profile requirements of existing §290.111(c)(5)(A) and (6)(A).

The commission adopts new §290.111(e)(4)(A)(ii) to contain the filter assessment requirements of existing §290.111(c)(5)(B) and (6)(B).

The commission adopts new §290.111(e)(4)(A)(iii) to contain the comprehensive performance evaluation requirements of existing §290.111(c)(5)(C) and (6)(C).

Similarly, the commission adopts new §290.111(e)(4)(B) to contain the special monitoring requirements for systems monitoring CFE in lieu of IFE currently contained in §290.111(c)(7).

The commission adopts new §290.111(e)(4)(B)(i) to contain the filter profile requirements for systems monitoring CFE in lieu of IFE of existing §290.111(c)(7)(A).

The commission adopts new §290.111(e)(4)(B)(ii) to contain the filter assessment requirements for systems monitoring CFE in lieu of IFE of existing §290.111(c)(7)(B).

The commission adopts new §290.111(e)(4)(B)(iii) to contain the comprehensive performance evaluation requirements for systems monitoring CFE in lieu of IFE of existing §290.111(c)(7)(C).

The commission adopts new §290.111(e)(5) to contain the analytical requirements currently contained in §290.111(d) and reference a new turbidity method recently approved by the EPA.

The commission adopts new §290.111(e)(5)(A)(i) and (ii) to relocate the provisions currently contained in §290.111(d)(1). The commission adopts new §290.111(e)(5)(A)(iii) to reference the Hach FilterTrak Method 10133 contained in the federal LT2 in 40 CFR §141.74(a)(2).

The commission adopts new §290.111(e)(5)(B) to contain the requirements of existing §290.111(d)(2) regarding continuous or grab sampling for turbidity.

The commission adopts new §290.111(e)(5)(C) to contain the requirements for continuous turbidity monitoring in existing §290.111(d).

The commission adopts new §290.111(e)(5)(C)(i) to contain the SCADA requirements for continuous turbidity monitoring in existing §290.111(d)(3)(A).

The commission adopts new §290.111(e)(5)(C)(ii) to contain the SCADA requirements for grab sampling at large systems when there is a failure of continuous turbidity monitoring in existing §290.111(d)(3)(B).

The commission adopts new §290.111(e)(5)(C)(iii) to contain the requirements of existing §290.111(d)(5)(B) for grab sampling when there is a failure of continuous turbidity monitoring at small systems.

The commission adopts new §290.111(e)(5)(D) to relocate the instrumentation requirements currently contained in §290.111(d)(6). The commission did not replace the expired provision contained in the §290.111(d)(7), which is repealed.

The commission adopts new §290.111(f) to incorporate the requirements of current §290.111(b)(1)(B) and establish minimum filtration requirements consistent with those contained in the federal LT2 in 40 CFR §141.719.

The commission adopts new §290.111(f)(1) to incorporate the requirements of 40 CFR §141.73(d) that requires the state to set treatment technique requirements for unconventional filtration technologies.

The commission adopts new §290.111(f)(1)(A) to incorporate the requirements currently contained in §290.111(b)(1)(B) and adopts new §290.111(f)(1)(B) to incorporate the requirements of 40 CFR §141.73(d) that require the state to set operating requirements for unconventional filtration technologies if microbial treatment credit is awarded.

The commission adopts new §290.111(f)(2), (2)(A) and (B) to incorporate the combined filter effluent monitoring requirements for cartridge and membrane filters of 40 CFR §141.700(a) and provide consistency with existing §290.111(c)(1).

The commission adopts new §290.111(f)(2)(C) to incorporate the provisions of 40 CFR §141.719(b)(4)(i) and (ii) which require membrane filters be monitored continuously and readings recorded.

The commission adopts new §290.111(f)(2)(D) to incorporate the provisions of 40 CFR §141.719(b)(3) and (3)(i) that require systems using membrane filters to conduct direct integrity testing.

The commission adopts new §290.111(f)(2)(D)(i) to incorporate the requirements of 40 CFR §141.719(b)(3)(ii) and (iii) that systems using membrane filters conduct direct integrity testing with sufficient sensitivity.

The commission adopts new §290.111(f)(2)(D)(ii) to incorporate the requirements of 40 CFR §141.719(b)(3)(iv) that systems using membrane filters conduct direct integrity testing that allows them to assure the membrane unit meets the removal credit approved by the executive director.

The commission adopts new §290.111(f)(2)(D)(iii) to incorporate the ability of the state described in 40 CFR §141.719(b)(3)(vi) and §141.73(d) to approve less frequent direct integrity testing.

The commission adopts new §290.111(f)(2)(D)(iv) to incorporate the requirements of 40 CFR §141.719(b)(3)(vi) regarding the frequency of direct integrity testing and the ability of the state to approve less frequent direct integrity testing to these same systems.

The commission adopts new §290.111(f)(2)(D)(v) to incorporate the requirements of 40 CFR §141.719(b)(4)(iv) and (v) that systems using membrane filters conduct direct integrity testing if indirect integrity testing shows possible system failure.

The commission adopts new §290.111(f)(2)(D)(vi) to incorporate the requirements of 40 CFR §141.719(b)(3)(v) that systems using membrane filters which fail direct integrity testing must remove the membrane unit from service until it is fixed.

The commission adopts new §290.111(f)(2)(E) to incorporate the requirements of 40 CFR §141.73(d) that requires the state to set monitoring requirements for unconventional filtration technologies if microbial treatment credit is awarded.

The commission adopts new §290.111(f)(3) to consistently apply the analytical requirements in adopted §290.111(e)(5) to turbidity measurements.

The commission adopts new §290.111(f)(3)(A) which references the adopted new §290.111(e)(5)(A) in order to maintain consistency in the methods used to measure CFE turbidity levels regardless of the type of filtration technology used at the plant.

The commission adopts new §290.111(f)(3)(B) to incorporate provisions consistent with the requirements of the federal LT2 in 40 CFR §141.719(b)(4)(i). Although the adopted rule continues to allow the executive director to approve other methods of monitoring water quality, the adoption also continues to require the EPA-approved Hach FilterTrak Method 10133 at plants that choose to monitor the turbidity level of the water produced by individual filter units.

The commission adopts new §290.111(f)(3)(C) to incorporate the requirements of 40 CFR §141.73(d) that requires the state to set analytical requirements for unconventional filtration technologies.

The commission adopts new §290.111(f)(3)(D) to extend the data collection requirements adopted in new §290.111(e)(5)(C) to unconventional filtration technologies.

The commission adopts new §290.111(f)(3)(E) to consistently apply the monitoring requirements in adopted §290.111(e)(5)(C)(ii) to cartridge filters.

The commission adopts new §290.111(g) to implement various provisions of the LT2 which identify several approaches that treatment plants can use to achieve enhanced pathogen control and allow the state to establish design, operational, monitoring, and reporting requirements for these approaches.

The commission adopts new §290.111(g)(1) to incorporate the provisions of the federal LT2 in 40 CFR §141.718(b). The adopted rules will allow the executive director to approve a 1.0-log *Cryptosporidium* removal credit for plants that meet enhanced IFE performance criteria or approve a 0.5-log *Cryptosporidium* removal credit to plants that meet enhanced CFE, but not enhanced IFE, performance criteria. The commission's adoption is consistent with the LT2 requirement that plants meeting both enhanced IFE and CFE performance criteria receive credit for providing a maximum of 1.0-log *Cryptosporidium* credit.

The commission adopts new §290.111(g)(1)(A) to incorporate the requirement of the federal LT2 in 40 CFR §141.718(b) that plants have the ability to receive additional 1.0-log microbiological treatment credit for media filters if specified conditions are met on each filter.

The commission adopts new §290.111(g)(1)(A)(i) - (iii) to incorporate the requirement of 40 CFR §141.718(b) that plants receive an additional microbiological treatment credit if the filtered water turbidity of each filter is continuously monitored and recorded every 15 minutes and the filtered water

turbidity of each filter is less than or equal to 0.15 NTU in at least 95% of the measurements recorded each month, and if no individual filter produces water above 0.3 NTU in two consecutive readings.

The commission adopts new §290.111(g)(1)(B), (B)(i) and (ii) to address the requirements of 40 CFR §141.718(b)(3) that the executive director has the ability to approve additional treatment credits if the plant does not meet §290.111(g)(1)(A) and if the executive director determines that the failure was caused by unusual and short term events that could not be prevented by plant design, operation or maintenance and if this is only the first or second such failure within the last twelve months.

The commission adopts new §290.111(g)(2) to incorporate the requirement of the federal LT2 in 40 CFR §141.718(a) that plants have the ability to receive an additional 0.5-log microbiological treatment credit for media filters if three conditions are met. Specifically, the commission adopts new §290.111(g)(2)(A) - (C) to incorporate the requirements of 40 CFR §141.718(a) and (b) that plants receive additional microbiological treatment credit if the filtered water turbidity of each filter is continuously monitored and recorded every 15 minutes, and the combined filter effluent turbidity is less than or equal to 0.15 NTU in at least 95% of the measurements recorded each month. As the third condition, the commission adopts new §290.111(g)(2)(C) to incorporate the implicit requirements of 40 CFR §141.718(a) and (b) to ensure that a treatment plant does not receive a total of more than 1.0 log of additional credit allowed by federal rule for plants meeting enhanced performance standards for both IFE and CFE turbidity levels in the same month.

The commission adopts new §290.111(g)(3) to incorporate the requirement of the federal LT2 in 40 CFR §141.719(c) that plants have the ability to receive an additional 0.5-log microbiological treatment credit

for a second set of filters if four conditions are met. As the first of these four conditions, the commission adopts new §290.111(g)(3)(A) to incorporate the requirement of 40 CFR §141.719(c) that plants have the ability to receive an additional 0.5-log microbiological treatment credit for a second set of filters if the filters meet existing state filter design criteria. As the second of these four conditions, the commission adopts new §290.111(g)(3)(B) to incorporate the requirement of 40 CFR §141.719(c) that plants have the ability to receive an additional 0.5-log microbiological treatment credit for a second set of filters if all of the plant flow passes through both stages of filters. As the third and fourth of these four conditions, the commission adopts new §290.111(g)(3)(C) and (D) to incorporate the requirement of 40 CFR §141.719(c) to establish that plants have the ability to receive an additional 0.5-log microbiological treatment credit for a second set of filters if the individual filter turbidity of the first stage of filters is monitored and recorded every 15 minutes. To receive the additional credit for the second stage of filtration, the first stage of filters must also meet the existing minimum requirements to achieve the existing treatment credit.

The commission adopts new §290.111(g)(3)(D) to incorporate the requirements of 40 CFR §141.719(c) and existing §290.111(e)(1)(A) that plants have the ability to receive an additional 0.5-log microbiological treatment credit for a second set of filters if the individual filter turbidity of the first stage of filters is below 1.0 NTU. To receive the additional credit for the second stage of filtration, the first stage of filters must meet the existing minimum requirements to achieve the existing treatment credit.

The commission adopts new §290.111(g)(4) to incorporate the requirement of 40 CFR §141.718(c) that plants have the ability to receive an additional microbiological treatment credit for other treatment strategies if approved by the executive director.

The commission adopts new §290.111(g)(4)(A) to incorporate the requirement of 40 CFR §141.718(c) that plants have the ability to receive an additional microbiological treatment credit for other treatment strategies if the other strategies achieve a quantifiable reduction in the risk of waterborne disease and treats all the water produced by the plant.

The commission adopts new §290.111(g)(4)(B) to incorporate the requirement of 40 CFR §141.718(c) and 40 CFR §141.715(a)(1) that plants have the ability to receive an additional microbiological treatment credit for other treatment strategies if the other strategies conform to applicable requirements found in 40 CFR §§141.715 - 141.720.

The commission adopts new §290.111(g)(4)(C) to incorporate the requirement of 40 CFR §141.718(c)(3) that the executive director have the ability to establish minimum site-specific requirements for alternative treatment strategies.

The commission adopts new §290.111(g)(4)(D) to incorporate the requirement of 40 CFR §141.718(c)(1) that the executive director cannot approve additional treatment credits for alternative treatment strategies if the treatment process already has treatment credits in this subsection.

The commission adopts new §290.111(h) to move the provisions currently contained in §290.111(e) and to incorporate the reporting requirements associated with the new federal rules.

The commission adopts new §290.111(h)(1) in order to relocate the requirement currently in §290.111(e)(1). The adopted change also results in an amendment which reduces the time that a public water system has to consult with the executive director following a CFE reading over 1.0 NTU. This amendment is necessitated by requirements of the federal PNR in 40 CFR §141.202(a)(5) and (b)(2).

The adopted new §290.111(h)(2) contains a version of the requirement in existing §290.111(e)(2). The adopted amendment more accurately describes the types of systems that must submit a Surface Water Monthly Operating Report.

Similarly, the adopted new §290.111(h)(3) contains an amended version of the requirement in existing §290.111(e)(3) which updates the description of, and form number for, the report used by plants that continuously monitor CFE turbidity in lieu of IFE turbidity.

The adopted new §290.111(h)(4) - (6) contain amended versions of the requirements in existing §290.111(e)(4) - (6). In this case, the amendments reflect the locations of the applicable provisions in the new §290.111(e)(4).

The adopted new §290.111(h)(7) and (8) contain the reporting requirements for plants using membrane and UV facilities, respectively, and address the requirements of the federal LT2 in 40 CFR §171.721(f)(10) and (15), respectively.

The adopted new §290.111(h)(9) requires systems using other technologies to meet the treatment technique requirements of state and federal rules to submit other reports that the executive director needs

to determine if the plant is meeting minimum standards. This adopted provision is consistent with the LT2 requirements contained in 40 CFR §171.721(f), (f)(8) and (9), and 40 CFR §171.718(c)(3).

In response to comment, the commission added new §290.111(h)(10) to explicitly state that systems must submit their *Cryptosporidium* bin classification to the state as required in 40 CFR §141.721(c). As a result of these additions, the commission has renumbered the remaining paragraph to §290.111(h)(11).

The adopted new §290.111(h)(11) contains an amended version of the requirement in existing §290.111(e)(7) which is amended to use the correct name of the TCEQ and the correct syntax protocol for the mailing address.

The commission adopts new §290.111(i)(1) to address all of the monitoring violations that could occur under adopted §290.111. The adopted new §290.111(i)(1) covers the requirements in existing §290.110(c)(1) and §290.111(f)(1) and addresses various monitoring requirements contained throughout 40 CFR Part 141, Subpart Q - Enhanced Treatment for *Cryptosporidium*.

The adopted new §290.111(i)(2) relocates the reporting violations in existing §290.110(c)(2) and §290.111(f)(2) and (3) and addresses various reporting requirements contained throughout 40 CFR Part 141, Subpart Q - Enhanced Treatment for *Cryptosporidium*.

The commission adopts new §290.111(i)(3) which will replace the analogous existing rule, §290.111(f)(4), which is being repealed.

The commission adopts new §290.111(i)(4) to establish the criteria for an acute treatment technique violation for plants using membrane technology and in response to the federal LT2 requirements in 40 CFR §141.173(b) and 40 CFR §141.551(a)(2).

The adopted new §290.111(i)(5) relocates the provisions in existing §290.110(b)(1), replaces the current version of §290.111(f)(5) which the commission repeals, and allows the executive director to implement the requirements of the federal LT2 in 40 CFR §141.711(a).

In response to comment, the commission adopts new §290.111(i)(6) which contains the treatment technique violation criteria for systems that fail to request a Bin Classification and allows the executive director to implement the requirements of the federal LT2 in 40 CFR §141.710(f).

Based on the addition of new §290.111(i)(6) in response to comment, the commission renumbers proposed §290.111(i)(6) to §290.111(i)(7). The commission adopts new §290.111(i)(7) to contain an existing violation criteria in §290.111(f)(6).

Based on the addition of new §290.111(i)(6) in response to comment, the commission renumbers proposed §290.111(i)(7) to §290.111(i)(8). The commission adopts new §290.111(i)(8) to comply with directives received from the EPA and contained in their publication EPA 816-R-01-010, Final State Implementation Guidance for the Public Notification (PN) Rule.

The commission relocates the public notice requirements in existing §290.111(g) to adopted new §290.111(j).

The commission adopts new §290.111(j)(1) to relocate and amend the public notification requirements in existing §290.111(g)(1). This would address the adopted acute treatment technique requirements for plants using membrane technology and assure that systems notify their customers in accordance with the timelines established in the federal LT2 in 40 CFR §141.202(b)(2).

The adopted new §290.111(j)(2) contains an amended version of the rule currently contained in §290.111(g)(2). This would allow the commission to address the provisions of the federal PNR in 40 CFR §141.202(a)(5) and (b)(2), incorporating the correct 24-hour reporting requirement, to replace the incorrect reference to reporting occurring by the end of the next business day.

The adopted new §290.111(j)(2)(A) addresses the requirement in the federal PNR in 40 CFR §141.202(b)(2) for the executive director to determine the level of customer notification required after the occurrence of a combined filter turbidity exceedance of 1.0 NTU based on the results of the consultation with the water system.

The commission adopts new §290.111(j)(2)(B) to incorporate 40 CFR §141.202(b)(2) requiring a system to notify its customers in accordance with the requirements of §290.122(a) if they fail to consult with the executive director after the occurrence of a combined filter turbidity exceedance of 1.0 NTU.

The commission adopts new §290.111(j)(3) to address the public notification requirements in existing §290.110(b)(1) and §290.111(f)(5) and treatment technique requirements described in §290.111(c), (d)(1), (e)(1) and (f)(1).

Section 290.112, Total Organic Carbon (TOC), contains requirements related to the removal of naturally occurring organic material (total organic carbon) in source water that may form potentially harmful disinfection by-products.

The commission adopts §290.112 to add references to elements added elsewhere as part of the incorporation of new federal requirements, to remove references to effective dates that have passed, to correct internal references, and to correct typographical and syntax errors.

Section 290.112(b)(1) is amended by writing out the first use of the terms "total organic carbon" and "milligrams per liter" before using their acronyms, in accordance with agency syntax protocols. Section 290.112(b)(2)(C) is amended by writing out the first use of the terms "calcium carbonate," "total trihalomethanes," and "haloacetic acid-group of five" prior to using their acronyms. Section 290.112(b)(2)(E) is amended by writing out the first use of the terms "specific ultraviolet absorbance" and "liters per milligram-meter" prior to using their acronyms.

In response to comment, the commission defined "monthly" as "every 30 days" in §290.112(c)(2).

In response to comment, the commission defined "per plant per quarter" as "every 90 days" in §290.112(c)(2)(A) and (B).

In response to comment, the commission added §290.112(c)(2)(C) to contain the reduced TOC monitoring criteria for systems with low TOC, TTHM, and HAA5 levels.

In §290.112(e)(1) is amended by updating the name of the agency from "Texas Natural Resource Conservation Commission" to "Texas Commission on Environmental Quality" in the mailing address, consistent with United States Postal Service syntax protocols. The TCEQ form number for the Monthly Operational Report for Total Organic Carbon is added to §290.112(e)(2). The references to large system and small system effective reporting dates in 2001 and 2003 are deleted from §290.112(e)(2)(A) and (B), respectively. References to disinfection by-products requirements in §290.112(e)(3)(A) are updated to refer to §290.113 and §290.115 containing existing Stage 1 and adopted DBP2 requirements. Section 290.112(e)(3)(B) is amended by deleting the description of the internal reference to §290.113 because that description appears earlier in the text of this section.

Section 290.112(f)(4) is added to explicitly identify the type of violation resulting from failure to perform a required public notification for consistency with PNR requirements specified in publication EPA 816-R-01-010, Final State Implementation Guidance for the Public Notification (PN) Rule.

Existing §290.113, Disinfection By-products (TTHM and HAA5), contains the standards for disinfection by-products resulting from the Stage 1 Disinfection Byproducts Rule promulgated by the EPA in December 1998.

The commission adopts the amendment to the title of §290.113 which adds the term "Stage 1" because this section includes the requirements of the federal Stage 1 Disinfection Byproducts Rule. This adopted amendment provides differentiation from 30 TAC §290.115 which is added to include the provisions of the federal DBP2. The term "Stage 2" is added to reference the provisions of the new rule.

The commission adopts §290.113(a)(1) to include the schedule in Figure: 30 TAC §290.113(a)(1), Date to Start Stage 2 Compliance, upon which public water systems may cease to comply with the provisions of the Stage 1 Disinfection Byproducts Rule and must start to comply with the provisions of DBP2, as contained in 40 CFR §141.620(c)(1) - (5). The commission amends §290.113(a)(2) to ensure that the monitoring dates are clear. The commission deletes the existing language of §290.113(a)(1) - (4) which reference effective dates that are in the past.

The commission adopts new §290.113(a)(2) to specify the dates upon which compliance with the Stage 1 requirements of this section will cease.

The commission adopts the amendment to Figure: 30 TAC §290.113(c)(3) which adds "Stage 1" to the title of the figure so that the new title is "Stage 1 Routine Monitoring Frequency and Locations for TTHM and HAA5." This adopted amendment provides differentiation from 30 TAC §290.115 which is added to include the provisions of the federal DBP2.

The commission adopts the amendment to Figure: 30 TAC §290.113(c)(4) which adds "Stage 1" to the title of the figure so that the new title is "Stage 1 Reduced Monitoring Frequency and Locations for TTHM and HAA5." This adopted amendment provides differentiation from 30 TAC §290.115 which is added to include the provisions of the federal DBP2. In response to comment, the commission to add a footnote to the table in Figure: 30 TAC §290.113(c)(4) to include the reduced TTHM and HAA5 monitoring criteria when a system has relatively low levels of TTHM, HAA5, and TOC to be consistent with the federal language in 40 CFR §141.132(b)(1)(iii).

The commission adopts §290.113(e) to replace the outdated name of the agency with the current name and to format the agency's address consistent with United States Postal Service standards.

Section 290.114, Other Disinfection By-products (Chlorite and Bromate) contains the health-based standards, sampling requirements, reporting requirements, and public notification requirements for disinfection by-products other than trihalomethanes and haloacetic acids. It includes standards for chlorite, which is a by-product of disinfecting water using chlorine dioxide, and standards for bromate, which is a by-product of disinfecting water using ozone.

The commission adopts §290.114 to add references to elements added elsewhere as part of the incorporation of new federal requirements, to remove references to effective dates that have passed, to correct internal references, and to correct typographical and syntax errors.

In §290.114(a)(1) the first use of the term "milligrams per liter" is written out prior to use of its abbreviation. Section 290.114(a)(2)(B)(iv) and (v) is deleted to eliminate references to compliance deadlines that have passed. References to past deadlines are removed from §290.114(a)(3). Specifically, the commission deletes §290.114(a)(3)(B) which contains a compliance date that has passed, and renumbers §290.114(a)(3)(C). The internal reference to reporting analytical results in existing §290.114(a)(4)(B) is corrected to conform with agency syntax protocols. In §290.114(a)(4)(C) it is adopted to update the name of the agency from "Texas Natural Resource Conservation Commission" to "Texas Commission on Environmental Quality" in the mailing address, consistent with United States Postal Service standards. New §290.114(a)(5)(D) is adopted to explicitly identify the type of violation

resulting from failure to perform a required public notification for consistency with the PNR requirements specified in publication EPA 816-R-01-010, Final State Implementation Guidance for the Public Notification (PN) Rule.

The commission adopts §290.114(b)(3) to delete the description of the contents of §290.119 because that subsection is previously referenced in this section. In addition, the reference in §290.114(b)(3) to use of certified labs is amended to reflect that authority for certification of drinking water laboratories under the Safe Drinking Water Act has passed from the (then) Texas Department of Health to the TCEQ. The commission adopts §290.114(b)(4) to update the name of the agency from "Texas Natural Resource Conservation Commission" to "Texas Commission on Environmental Quality" in the mailing address, consistent with United States Postal Service standards. New §290.114 (b)(5)(D) is adopted to explicitly identify the type of violation resulting from failure to perform a required public notification for consistency with PNR requirements specified in publication EPA 816-R-01-010, Final State Implementation Guidance for the Public Notification (PN) Rule. The commission amends §290.114(b)(6)(A) by deleting the description of the contents of §290.122(b) to conform to the syntax standards.

The commission adopts new §290.115, Stage 2 Disinfection By-products (TTHM and HAA5), to contain the requirements of DBP2. EPA promulgated DBP2 as part of their congressional mandate to promulgate rules to reduce the risk to public health from potentially carcinogenic disinfection by-products, specifically trihalomethanes and haloacetic acids. Trihalomethanes and haloacetic acids increase the longer the water resides in distribution system pipes. The Stage 1 Disinfection By-products Rule based compliance on a running annual average of samples collected at all locations in the distribution system,

which means that public water system customers living in more remote areas of a distribution system currently experience much greater risk than customers living near the plant. DBP2 reduces this inequity by requiring systems to identify locations in the system with elevated trihalomethane and haloacetic acid levels and changing the compliance determination method to base compliance on locational running annual averages. The federal DBP2 is significantly different than the existing Stage 1 requirements, so a new section is adopted.

The commission adopts new §290.115(a) to contain the existing requirements of §290.113(a), consistent with the applicability requirements of the new federal DBP2 requirements. New §290.115(a)(1) is adopted to reference the start dates for early monitoring requirements contained in adopted §290.115(c). New §290.115(a)(2) is adopted to specify the dates upon which compliance with all of the requirements of DBP2 will start, and the requirements of the Stage 1 Disinfection Byproducts Rule contained in 40 CFR §141.620(c)(1) - (5) will cease. The commission adopts Figure: 30 TAC §290.115(a)(2), Date to Start Stage 2 Compliance, to present the information in a clear and organized manner. The commission made a conforming change to Figure: 30 TAC §290.115(a)(2) to include the allowance of a 2-year extension for systems that must make capital improvements that is contained in 40 CFR §141.620(c)(5) in a footnote to the table. New §290.115(a)(2)(A) is adopted to contain the requirement of the federal DBP2 in 40 CFR §141.620(c)(6) that establishes the start date for systems performing quarterly monitoring. New §290.115(a)(2)(B) is adopted to contain the requirement of 40 CFR §141.620(c)(6)(ii) that establishes the start date for systems monitoring less frequently than quarterly.

The commission adopts new §290.115(b) to contain the MCL of existing §290.113(b); to incorporate the new MCL compliance method of the federal DBP2 in 40 CFR §141.625(b); and to contain the operation

evaluation levels (OELs) for total trihalomethanes (TTHM) and the regulated haloacetic acids-group of five (HAA5) of 40 CFR §141.626. New §290.115(b)(1) is adopted to incorporate the MCLs for TTHM and HAA5 from existing §290.113(b), consistent with the MCLs set by the federal DBP2 in 40 CFR §141.64(b)(1)(i) and 40 CFR §141.625(b). New §290.115(b)(1)(A) is adopted to contain the MCL for TTHM from existing §290.113(b)(1) and new §290.115(b)(1)(B) is adopted to contain the MCL for HAA5 from existing §290.113(b)(2).

The commission adopts new §290.115(b)(2) to contain the calculation basis for determining the OEL of the federal DBP2 in 40 CFR §141.626(a). New §290.115(b)(2)(A) is adopted to contain the OEL for TTHM and §290.115(b)(2)(B) is adopted to contain the OEL for HAA5 from 40 CFR §141.626(a).

The commission adopts new §290.115(c) to contain the Stage 2 monitoring requirements for TTHM and HAA5 and to contain the elements of existing §290.113(c) that continue to apply under the new federal DBP2 rule.

The commission adopts new §290.115(c)(1) to contain the Stage 2 requirement of 40 CFR §141.600(a) that systems must determine Stage 2 compliance monitoring locations with representative high TTHM and HAA5 concentrations throughout the distribution system. In addition, the commission incorporates the dates that public water systems must determine these sites, as provided in the federal DBP2, 40 CFR §141.620(c)(1) - (5). This information is in Figure: 30 TAC §290.115(c)(1), Date to Establish Stage 2 Sites.

The commission adopts new §290.115(c)(1)(A) to contain the federal requirement of 40 CFR §141.600(b) that if a system is required to perform initial distribution system evaluation (IDSE) sampling, then that system must use those results when determining Stage 2 compliance locations.

The commission adopts new §290.115(c)(1)(B) to contain the related provision of 40 CFR §141.622(a)(2) describing the process that systems which are not required to do the early IDSE sampling must use to set Stage 2 compliance monitoring locations.

The commission adopts new §290.115(c)(1)(B)(i) to contain the provision of 40 CFR §141.622(a)(2) that systems which are required to have the same number of sample sites under both the Stage 1 and Stage 2 requirements can continue to use their existing Stage 1 sample locations under the new Stage 2 rules.

The commission adopts new §290.115(c)(1)(B)(ii) to contain the provision of 40 CFR §141.622(a)(2) requiring that systems with fewer existing Stage 1 sampling locations than the number of locations required by Stage 2 must identify additional sampling sites, and describing the required nature of these sample sites.

The commission adopts new §290.115(c)(1)(B)(iii) to contain the provision of 40 CFR §141.622(a)(2) that if a system has more existing Stage 1 sites than they are required to have under Stage 2, that the sites with highest TTHM and HAA5 levels must be used for Stage 2 compliance.

The commission adopts new §290.115(c)(1)(C) to incorporate the protocol for selecting Stage 2 sample sites given in the federal DBP2 in 40 CFR §141.605(c) by reference.

The commission adds new §290.115(c)(1)(D) to conform to the federal DBP2 rule in 40 CFR §141.622(c) establishing that when a system changes monitoring locations it must replace the location with the lowest disinfection by-product levels with locations that have potentially high disinfection by-product levels.

The commission adopts new §290.115(c)(2) to contain the routine Stage 2 sampling requirements of 40 CFR §141.621(a)(2) and to contain the existing requirement of §290.113(c)(2) that compliance samples must be collected under normal operating conditions. Section 290.115(c)(2) also contains Figure: 30 TAC §290.115(c)(2), Routine Stage 2 Monitoring Frequency and Number of Sites, which is included to present the dates in a clear and organized manner. In response to comment, the commission changed the first two lines in the far right column in Figure: 30 TAC §290.115(c)(2) from the number "1" to the phrase "1 or 2". In response to comment, the commission changed the ninth and tenth lines in the far right column from the number "1" to the number "2" in Figure: 30 TAC §290.115(c)(2) and added a reference to Footnote 3. Also in response to comment, the commission modified Footnote 3 in Figure: 30 TAC §290.115(c)(2) to clarify the conditions under which either one sample or two samples must be collected. The commission changed Footnote 4 in Figure: 30 TAC §290.115(c)(2) to establish that dual sample sets must be taken every 90 days in conformance with Footnote 2 to the Figure in 40 CFR §141.621(a)(2).

The commission adopts new §290.115(c)(3) to contain the reduced Stage 2 sampling locations and frequency of 40 CFR §141.623, which allows systems to sample less frequently if there are relatively low levels of TTHM and HAA5 detected in the distribution system. Section 290.115(c)(3) also contains Figure: 30 TAC §290.115(c)(3), Reduced Stage 2 Monitoring Frequency and Number of Sites, which is included to present the information in a clear and organized manner. In response to comment, the

commission amended Footnote 2 in Figure: 30 TAC §290.115(c)(3) to remain consistent with the federal DBP2 rule published January 4, 2006.

The commission adopts new §290.115(c)(3)(A) to contain the requirement of 40 CFR §141.623(a) that only compliance data may be used to qualify for reduced monitoring.

The commission adopts new §290.115(c)(3)(B) to contain the provisions of DBP2 relating to qualification to start reduced monitoring. The commission adopts new §290.115(c)(3)(B)(i) to contain the provisions of 40 CFR §141.132(b)(1)(iv) and 40 CFR §141.623(b) describing the conditions under which systems that are sampling annually or triennially may remain on reduced monitoring. The commission adopts new §290.115(c)(3)(B)(ii) to contain the provisions of 40 CFR §141.623(b) describing the conditions under which a system sampling quarterly may remain on reduced monitoring. The commission adopts new §290.115(c)(3)(B)(iii) to contain the provisions of 40 CFR §141.132(b)(1)(iii) and §141.623(a) describing the total organic carbon levels that must be maintained to allow a system treating surface water or groundwater under the direct influence of surface water to qualify for reduced monitoring. In response to comment, the commission modified a reference in §290.115(c)(3)(B)(iii) to state that monitoring must be conducted in accordance with §290.112(c)(2)(C) where previously the reference was §290.112 which is consistent with 40 CFR §141.132(b)(1)(iii) and §141.623(a).

The commission adopts new §290.115(c)(3)(C) to contain the provisions of 40 CFR §141.623(c) describing when systems will be returned to routine monitoring after reduced monitoring. The commission adopts new §290.115(c)(3)(C)(i) to contain the provision of 40 CFR §141.623(c) describing the conditions under which a system sampling quarterly will be returned to routine monitoring. The

commission adopts new §290.115(c)(3)(C)(ii) to contain the provision of 40 CFR §141.623(c) describing the conditions under which a system sampling annually or triennially will be returned to routine monitoring. New §290.115(c)(3)(C)(iii) is adopted to contain the provision of 40 CFR §141.623(c) describing the total organic carbon conditions under which a system treating surface water or groundwater under the direct influence of surface water will be returned to routine monitoring.

The commission adopts new §290.115(c)(3)(D) to contain the provision of 40 CFR §141.623(c) providing state authority to return a system to its routine monitoring schedule at any time.

The commission adopts new §290.115(c)(3)(E) to contain the provisions 40 CFR §141.627 requiring systems that are on reduced monitoring for Stage 1 and that have different monitoring locations for Stage 1 than for Stage 2 to initiate routine Stage 2 monitoring at the inception of the rule's effective dates.

The commission adopts new §290.115(c)(3)(F) to contain the conditions of 40 CFR §141.627 under which a system on reduced monitoring for Stage 1 may remain on reduced monitoring without interruption in the transition to Stage 2. The commission adopts new §290.115(c)(3)(F)(i) - (iii) to contain the provisions of 40 CFR §141.627 establishing that a system must have received a waiver to initial distribution system sampling, meet Stage 2 reduced monitoring criteria, and have the same Stage 1 and Stage 2 monitoring locations to remain on reduced monitoring through the transition to the Stage 2 rule requirements.

The commission adopts new §290.115(c)(3)(G) to contain the provisions of 40 CFR §141.629(a)(3) allowing the executive director to perform calculations and determine whether the system is eligible for reduced monitoring in lieu of having the system report that information.

The commission adopts new §290.115(c)(4) to contain the increased monitoring provisions of the federal DBP2 in 40 CFR §141.625. The commission adopts new §290.115(c)(4)(A) to contain the provision of 40 CFR §141.625(a) requiring a system on less frequent monitoring to increase monitoring to quarterly if any compliance sample exceeds a maximum contaminant level. The commission adopts new §290.115(c)(4)(B) to contain the conditions of 40 CFR §141.625(c) under which a system on increased quarterly monitoring may be returned to routine monitoring. The commission deleted the phrase "for which" and replace it with the word "if" in §290.115(c)(4)(B) to conform to the federal DBP2 rule in 40 CFR §141.620(e). This allows a system to return to routine monitoring after four quarters of increased quarterly monitoring if, at that time, the LRAA is less than three quarters of the MCL. If the commission did not make this change, as written, the proposed rule would require that the LRAA remain less than three quarters of the MCL for four consecutive quarters. The commission adopts new §290.115(c)(4)(C) to contain the provisions of 40 CFR §141.628 setting sample locations and timing for increased monitoring.

The commission adopts new §290.115(c)(5) to contain the provisions of the federal DBP2 in 40 CFR §141.600 for initial distribution system evaluation sampling (IDSE). The commission adopts new §290.115(c)(5)(A) to contain the provisions of 40 CFR §141.600(d)(1) providing conditions under which very small systems (VSS) may waive IDSE sampling. In response to comment, the commission added

new §290.115(c)(5)(D) to establish that the executive director may require IDSE sampling for systems in any circumstance consistent with 40 CFR§141.600(d)(2).

The commission adopts §290.115(c)(5)(B) to contain the provisions and timing of 40 CFR §141.600(d)(1) providing conditions under which the executive director may grant a waiver of IDSE sampling to systems that have shown very low levels of TTHM and HAA5 in Stage 1. Section §290.115(c)(5)(B) also contains Figure: 30 TAC §290.115(c)(5)(B), Timing of Stage 1 Samples Evaluated for 40/30 IDSE Waiver, which is included to present the information in an organized and clear manner. The commission adopts new §290.115(c)(5)(B)(i) to establish the criteria of 40 CFR §141.603(b)(1) requiring that each sample a system collected under Stage 1 must have been less than half the maximum contaminant level to waive IDSE sampling. The commission adopts new §290.115(c)(5)(B)(ii) to contain the provisions of 40 CFR §141.603(b)(2) requiring submittal of data to 0qualify to waive IDSE sampling. The commission adopts new §290.115(c)(5)(B)(iii) to contain the authority granted the state in 40 CFR §141.603(b)(3) to require IDSE sampling even if the system meets other qualification requirements. In response to comment, the commission changed §290.115(c)(5)(B) so that it does not limit the type of sample used to determine eligibility for a 40/30 waiver to compliance samples. In response to comment, to be consistent with 40 CFR §141.603(a), the words "compliance samples" were replaced with the word "levels" in §290.115(c)(5)(B). In response to comment, the commission deleted the word "compliance" in §290.115(c)(5)(B)(i), consistent with 40 CFR §141.603(a).

The commission adopts new §290.115(c)(5)(C) to incorporate the provisions of the federal DBP2 in 40 CFR §141.600(c) giving planning requirements, sampling schedules and reporting elements for systems that are required to perform IDSE sampling. Section §290.115(c)(5)(C) also contains Figure: 30 TAC

§290.115(c)(5)(C), IDSE Schedule, which is included to present the information in a clear and organized manner.

The commission adopts new §290.115(c)(5)(C)(i) to list the required IDSE sampling plan elements. New §290.115(c)(5)(C)(i)(I) is adopted to include the provisions of 40 CFR §141.601(a)(1) describing the required IDSE sampling plan. New §290.115(c)(5)(C)(i)(II) is adopted to include the provisions of 40 CFR §141.601(a)(2) relating to justification for sample site selection. In response to comment, new §290.115(c)(5)(C)(i)(III) was added to require that the IDSE plan include the system type and population served by the system, to be consistent with 40 CFR §141.601(a)(3).

The commission adopts new §290.115(c)(5)(C)(ii) to describe how IDSE sampling must proceed in accordance with 40 CFR §141.601(a)(1) and (b). New §290.115(c)(5)(C)(ii)(I) is adopted to incorporate the required number and type of IDSE sites of 40 CFR §141.601(a)(1). Section §290.115(c)(5)(C)(ii)(I) contains Figure: 30 TAC §290.115(c)(5)(C)(ii)(I), Number and Type of IDSE Sample Sites, which is included to present the information in a clear and organized manner. In response to comment, the commission corrected the typographical error in Figure: 30 TAC §290.115(c)(5)(C)(ii)(I) by adding the number "1" under the column headed "Potential High TTHM Locations," consistent with 40 CFR §141.601(b)(1). The commission adopts new §290.115(c)(5)(C)(ii)(II) to include the requirement for collection of dual sample sets at each monitoring location given in 40 CFR §141.601(a)(1). The commission adopts new §290.115(c)(5)(C)(ii)(III) to incorporate the provision of 40 CFR §141.601(a)(2) that IDSE sample locations must be different than the existing Stage 1 monitoring locations. The commission adopts new §290.115(c)(5)(C)(ii)(VI) to incorporate the requirement of 40 CFR §141.601(a)(2) requiring that IDSE sample locations must be distributed throughout the distribution

system. The commission adopts new §290.115(c)(5)(C)(ii)(V) to incorporate the provisions of 40 CFR §141.601(a)(1) describing the frequency of IDSE monitoring. Section §290.115(c)(5)(C)(ii)(V) contains Figure: 30 TAC §290.115(c)(5)(C)(ii)(V), Frequency of IDSE Monitoring, which is included to present the information in a clear and organized manner. The commission adopts §290.115(c)(5)(C)(ii)(VI) to incorporate the requirement of 40 CFR §141.601(a)(4) that the IDSE monitoring frequency and locations may not be reduced.

The commission adopts new §290.115(c)(5)(C)(iii) to incorporate the provisions of 40 CFR §141.601(c) describing the required elements of the IDSE report. The commission adopts new §290.115(c)(5)(C)(iii)(I) to incorporate the provisions of 40 CFR §141.601(c)(1) requiring that the data be reported in the format directed by the executive director, as provided in regulatory guidance. The commission adopts new §290.115(c)(5)(C)(iii)(II) to incorporate the provision of 40 CFR §141.601(c)(1) that a system must provide a new map or other documentation if changes occurred to the system after submittal of the IDSE plan. The commission adopts new §290.115(c)(5)(C)(iii)(III) to incorporate the provisions of 40 CFR §141.601(c)(2) requiring that the IDSE report must include an explanation of any deviations from the approved initial distribution system evaluation plan. The commission adopts new §290.115(c)(5)(C)(iii)(IV) to incorporate the requirements of 40 CFR §141.601(c)(3) requiring that the IDSE report recommend and justify Stage 2 sample sites under DBP2.

The commission adopts new §290.115(c)(5)(C)(iv) to allow systems to meet the initial distribution system requirements through submittal of a system specific study, as described in 40 CFR §141.602. The system specific study requirements are complex and expected to be used by few systems.

In response to comment, the commission added new §290.115(c)(5)(D) to allow the executive director to require a system to perform IDSE sampling or a system specific study under any circumstances.

The commission adopts new §290.115(d) to establish that compliance samples analyzed for TTHM and HAA5 must be analyzed using the methods contained in the federal DBP2 in 40 CFR §141.600(e).

The commission adopts new §290.115(e) to include the reporting requirements for TTHM and HAA5 of existing §290.113(e) and 40 CFR §141.626 and §141.629. The commission adopts new §290.115(e)(1) to incorporate the requirements of existing §290.113(e) requiring systems to report to the executive director results of any test related to TTHM or HAA5. The commission adopts new §290.115(e)(1)(A) to incorporate the provision of the federal DBP2 in 40 CFR §141.629(a)(1)(i) for submitting quarterly results. The commission adopts new §290.115(e)(1)(A)(i) to incorporate the provision of 40 CFR §141.629(a)(1)(i) requiring systems to report the number of samples taken during the last quarter. The commission adopts new §290.115(e)(1)(A)(ii) to incorporate the provision of 40 CFR §141.629(a)(1)(ii) that systems report the date and results of each sample taken during the previous quarter. The commission adopts new §290.115(e)(1)(A)(iii) to contain the provision of 40 CFR §141.629(a)(1)(iii) that systems must report compliance calculations. New §290.115(e)(1)(A)(iv) is adopted to include the provision of 40 CFR §141.629(a)(1)(iv) that systems must report whether the MCL was exceeded at any monitoring location. The commission adopts new §290.115(e)(1)(A)(v) to incorporate the provision of 40 CFR §141.629(a)(1)(v) that systems must report exceedance of an operation evaluation level.

The commission adopts new §290.115(e)(1)(B) to incorporate the provision of 40 CFR §141.629(a)(1)(iii) relating to reporting locational running annual average exceedances.

The commission adopts new §290.115(e)(1)(C) to incorporate the provisions of 40 CFR §141.629(a)(2) and (2)(v) relating to total organic carbon and disinfectant residual reporting requirements, respectively, for systems treating surface water or groundwater under the direct influence of surface water and seeking to conduct reduced monitoring.

The commission adopts new §290.115(e)(2) to incorporate the operation evaluation reporting requirements of the federal DBP2 in 40 CFR §141.626. New §290.115(e)(2)(A) is adopted to incorporate the schedule of 40 CFR §141.626(b)(1) requiring systems to submit required operation evaluation reports 90 days after an operation evaluation level exceedance. The commission adopts new §290.115(e)(2)(B) to contain the description of the contents of an operation evaluation report. The commission adopts new §290.115(e)(2)(B)(i) - (vi) to list the specific areas of distribution system operation to be discussed in the operation evaluation report. The commission adopts new §290.115(e)(2)(C) to incorporate the provision of 40 CFR §141.626(b)(2)(i) allowing the scope of an operation evaluation report to be limited with executive director approval, and requiring that limitation to be documented in writing as provided by 40 CFR §141.626(b)(2)(ii). The commission adopts new §290.115(e)(2)(D) to contain the requirement of 40 CFR §141.626(b)(1) that the operation evaluation report be submitted and approved in writing.

The commission adopts new §290.115(f) to contain the existing compliance determination requirements of §290.113(f) and additional requirements for compliance calculations and requirements of the new federal rule. The commission adopts new §290.115(f)(1) to contain the MCL compliance determination provision of the federal DBP2 in 40 CFR §141.625(b) requiring that compliance be based on the locational running annual average, and specifying the MCL violations for TTHM and HAA5. The

commission adopts new §290.115(f)(1)(A) to contain the existing requirements of §290.113 that compliance will be calculated based on approved sample sites, and that invalidated samples will not be used for determining compliance. Additionally, new §290.115(f)(1)(A) is adopted to incorporate the provisions of 40 CFR §141.625(b) that compliance will be calculated based on the locational running annual average of quarterly samples, but if one sample would cause an MCL exceedance even if following quarters had low concentrations of TTHM or HAA5, compliance calculations may use less than four quarters of data. In addition, new §290.115(f)(1)(A) is adopted to incorporate the provisions of 40 CFR §141.625(b) that if a system fails to collect all required samples, compliance will be based on the available data.

The commission adopts new §290.115(f)(1)(B) to provide the starting schedule for compliance determination under the new federal rule, as provided in 40 CFR §141.620(c). New §290.115(f)(1)(B)(i) is adopted to incorporate the start time for Stage 2 compliance determination for systems monitoring quarterly in accordance with 40 CFR §141.620(c)(7). New §290.115(f)(1)(B)(ii) is adopted to incorporate the start time for Stage 2 compliance determination for systems where a locational running annual average would be exceeded regardless of the results of subsequent quarters, as contained in 40 CFR §141.620(c)(7). The commission deleted the word "routine" in proposed §290.115(f)(1)(B)(ii) for consistency with 40 CFR §141.620(c)(7) to make conforming changes to match federal language. The compliance determination schedules in 40 CFR §141.620(c)(7) apply to a system on quarterly monitoring regardless of whether they are on a reduced, increased, or routine quarterly schedule. The commission adopts new §290.115(f)(1)(B)(iii) to incorporate the start time for Stage 2 compliance determination for systems that are required to monitor less frequently than quarterly, as contained in 40 CFR §141.620(c)(7). The commission adopts new §290.115(f)(1)(B)(iv) to incorporate the start time for

systems monitoring annually or triennially that start monitoring quarterly in the quarter following an exceedance, as contained in 40 CFR §141.629(a)(1)(iii). The commission deleted the word "quarterly" and replaced it with the phrase "all available" to conform with the federal DBP2 rule in 40 CFR §141.620(d)(1).

The commission adopts new §290.115(f)(1)(C) to contain the requirement of existing §290.113(f)(7) that if a public water system's failure to monitor makes it impossible to determine compliance with the MCL for TTHM or HAA5, the system commits an MCL violation for the entire period. The commission adopts new §290.115(f)(1)(D) to incorporate the provision of 40 CFR §141.629(a)(3) that the executive director may choose to perform calculations and determine MCL exceedances in lieu of having the system report that information. The commission adopts new §290.115(f)(1)(E) to incorporate the provision of 40 CFR §141.600(f) establishing that initial distribution system evaluation results will not be used for the purpose of compliance determination.

The commission adopts new §290.115(f)(2) to contain the requirements for monitoring violations from existing §290.113 and from the new federal rule. The provisions of the federal DBP2 in 40 CFR §141.625(b) defining a monitoring violation and its period are adopted to §290.115(f)(2). Additionally, the commission adopts this requirement to make it clearer that violations will accrue against the system on a quarterly basis to conform to the federal DBP2 in 40 CFR §141.620(e).

The commission adopts new §290.115(f)(2) to remove an unrelated annual period provision and a redundant phrase. Additionally, the commission added that the violation would occur for any system on a

quarterly monitoring schedule. The commission made these changes to conform with 40 CFR §141.620(e).

The commission adopts new §290.115(f)(3) to establish a monitoring violation related to the requirement under adopted §290.115(e)(2) that systems may be required to perform monitoring in order to evaluate distribution system operation. The commission adopts new §290.115(f)(4) to contain the monitoring violation requirement of existing §290.113(f)(2) relating to a system's responsibility to perform compliance monitoring. The commission adopts new §290.115(f)(5) to establish a reporting violation related to the requirement under adopted §290.115(e)(2) that systems submit any required operation evaluation report to the executive director. The commission adopts new §290.115(f)(6) to explicitly identify the type of violation resulting from failure to perform a required public notification for consistency with PNR requirements specified in publication EPA 816-R-01-010, Final State Implementation Guidance for the Public Notification Rule (PN) Rule.

The commission adopts new §290.115(g) to contain the existing public notification requirements of §290.113(g) and to add requirements related to the new federal rule. The commission adopts new §290.115(g)(1) to contain the MCL public notification requirement of existing §290.113(g)(1). The commission adopts new §290.115(g)(2) to contain the monitoring violation requirements of existing §290.113(g)(2). The commission adopts new §290.115(g)(3) to contain the provision of the federal DBP2 in 40 CFR §141.601(c)(4) that any initial distribution system evaluation compliance documents must be made available to the executive director or the public upon request. In response to comment, the reference to subsection (c)(5)(C) was changed to a reference to subsection (c)(5), thus referencing all documentation related to IDSE activities. The commission adopts new §290.115(g)(4) to incorporate the

provision of 40 CFR §141.626(b)(1) that operation evaluation reports must be made available to the executive director or the public upon request.

The commission adopts new §290.116, Groundwater Corrective Actions and Treatment Techniques, to incorporate the new federal corrective action and treatment technique requirements for groundwater systems contained in the federal GWR in 40 CFR §141.403.

The commission adopts new §290.116(a) to incorporate the applicability of the corrective action and treatment technique requirements for groundwater systems as described in the federal GWR in 40 CFR §141.403(a).

The commission adopts new §290.116(a)(1) to incorporate the requirements and applicability of the treatment technique requirements for groundwater systems with existing sources not required to meet the groundwater source monitoring requirements as described in the federal GWR in 40 CFR §141.403(b). In response to comment, the commission corrects a typographical error and restores the "(c)" to the following phrase: "in accordance with subsection (c) of this section."

The commission adopts new §290.116(a)(2) to specify the requirements and applicability of the treatment technique requirements for groundwater systems with new sources not required to meet the groundwater source monitoring requirements as described in 40 CFR §141.403(b).

The commission adopts new §290.116(b) to give the corrective action plan requirements for groundwater systems that have a fecal indicator positive source sample as described in the federal GWR in 40 CFR §141.403(a)(4).

The commission adopts new §290.116(b)(1) to establish the time frame in which a system has to consult with the state and develop a corrective action plan to address the fecal indicator positive source sample as described in 40 CFR §141.403(a)(4).

The commission adopts new §290.116(b)(2) to establish the time frame for public water systems to comply with the corrective action plan to address the fecal indicator positive source sample as described in 40 CFR §141.403(a)(5).

The commission adopts new §290.116(b)(3) to require executive director approval before any changes to the corrective action plan as described in the federal GWR in 40 CFR §141.403(a)(5)(ii)(A).

The commission adopts new §290.116(b)(4) which allows the executive director to establish interim measures to protect public health in addition to the requirements of the corrective action plan as described in the federal GWR in 40 CFR §141.403(a)(5)(ii)(B).

The commission adopts new §290.116(b)(5) to incorporate corrective action options required for corrective action plans as described in the federal GWR in 40 CFR §141.403(a)(6).

The commission adopts new §290.116(b)(5)(A) to incorporate well disinfection and fecal indicator monitoring as a corrective action option consistent with 40 CFR §141.403(a)(4) and the special primacy requirements of 40 CFR §142.16(o)(1)(iii).

The commission adopts new §290.116(b)(5)(B) to incorporate the corrective action of eliminating the groundwater source that was found to be fecal indicator positive as defined in 40 CFR §141.403(a)(6)(ii).

The commission adopts new §290.116(b)(5)(C) to incorporate the corrective action of eliminating the source of fecal contamination, followed by well disinfection and source monitoring as defined in 40 CFR §141.403(a)(6)(iii).

The commission adopts new §290.116(b)(5)(D) to incorporate the corrective action of providing 4-log treatment of viruses as defined in 40 CFR §141.403(a)(6)(iv).

The commission adopts new §290.116(c) requiring groundwater systems to demonstrate 4-log treatment of viruses by meeting minimum disinfection requirements as required by the federal GWR in 40 CFR §141.403(b) and maintaining consistency with disinfectant monitoring requirements of existing §290.110(c).

The commission adopts new §290.116(c)(1) requiring groundwater systems to monitor the performance of chemical disinfection facilities as required by 40 CFR §141.403(b) and maintaining consistency with disinfectant monitoring requirements of existing §290.110(c).

The commission adopts new §290.116(c)(1)(A) to incorporate the monitoring requirements of groundwater systems serving a population greater than 3,300 that are achieving 4-log viral inactivation as required by 40 CFR §141.403(b)(3)(i)(A).

The commission adopts new §290.116(c)(1)(B) to incorporate the disinfectant monitoring requirements needed to achieve 4-log viral inactivation for groundwater systems serving a population less than 3,300 as required by 40 CFR §141.403(b)(3)(i)(B) consistent with the disinfectant monitoring requirements of existing §290.110(c)(1)(A).

The commission adopts new §290.116(c)(1)(C) to establish the requirements for disinfection contact time as it relates to the disinfectant monitoring requirements of 40 CFR §141.403(b)(3)(i) and to maintain consistency with contact time determination requirements of existing §290.110(c)(1)(B).

The commission adopts new §290.116(c)(1)(D) to establish the requirements for increased disinfection monitoring if appropriate levels of treatment are not achieved. This relates to the disinfectant monitoring requirements of 40 CFR §141.403(b)(3)(i) and maintains consistency with contact time determination requirements of §290.110(c)(1)(C).

The commission adopts new §290.116(c)(2) requiring groundwater systems to monitor the performance of UV light disinfection facilities as allowed by the federal GWR in 40 CFR §141.403(b)(3)(ii) which specifies the monitoring requirements for alternative treatment and by 40 CFR §141.720(d)(3)(i) which establishes the monitoring requirements for UV light disinfection facilities.

The commission adopts new §290.116(c)(3) to apply the analytical requirements for disinfectant monitoring provided in existing §290.110(d) to the groundwater systems that must meet the requirements of this section. These existing requirements apply to systems operating under normal conditions described in §290.110 and also apply to systems performing corrective action or treatment under the federal GWR, as detailed throughout adopted §290.116.

The commission adopts new §290.116(c)(3)(A) to specify that the analytical requirements for pH meters contained in existing §290.110(d)(1) also apply to the groundwater systems that must meet the requirements of this section.

The commission adopts new §290.116(c)(3)(B) to specify that the analytical requirements for temperature measurements as given in existing §290.110(d)(2) also apply to the groundwater systems that must meet the requirements of this section.

The commission adopts new §290.116(c)(3)(C) to specify that the analytical requirements for measuring free chlorine residual as specified in existing §290.110(d)(3) also apply to the groundwater systems that must meet the requirements of this section.

The commission adopts new §290.116(c)(3)(C)(i) to specify that apply the analytical requirements for measuring free chlorine residual using amperometric titration as provided in §290.110(d)(3)(A) also apply to the groundwater systems that must meet the requirements of this section.

The commission adopts new §290.116(c)(3)(C)(ii) to specify that the analytical requirements for measuring free chlorine residual using DPD Ferrous titration as set out in existing §290.110(d)(3)(B) also apply to the groundwater systems that must meet the requirements of this section.

The commission adopts new §290.116(c)(3)(C)(iii) to specify that apply the analytical requirements for measuring free chlorine residual using a DPD method using a colorimeter or spectrophotometer as described in existing §290.110(d)(3)(C) also apply to the groundwater systems that must meet the requirements of this section.

The commission adopts new §290.116(c)(3)(C)(iv) to specify that the analytical requirements for measuring free chlorine residual using springaldizine as given in existing §290.110(d)(3)(D) also apply to the groundwater systems that must meet the requirements of this section.

The commission adopts new §290.116(c)(3)(D) to specify that the analytical requirements for measuring chloramine residual given in existing §290.110(d)(4) also apply to the groundwater systems that must meet the requirements of this section.

The commission adopts new §290.116(c)(3)(D)(i) to specify that the analytical requirements for measuring chloramine residual using amperometric titration specified in existing §290.110(d)(4)(A) also apply to the groundwater systems that must meet the requirements of this section.

The commission adopts new §290.116(c)(3)(D)(ii) to specify that the analytical requirements for measuring chloramine residual using DPD Ferrous titration in existing §290.110(d)(4)(B) also apply to the groundwater systems that must meet the requirements of this section.

The commission adopts new §290.116(c)(3)(D)(iii) to specify that the analytical requirements for measuring chloramine residual using a DPD that uses a colorimeter or spectrophotometer of existing §290.110(d)(4)(C) and (C)(i) also apply to the groundwater systems that must meet the requirements of this section.

The commission adopts new §290.116(c)(3)(E) to specify that the analytical requirements for measuring chlorine dioxide residual as defined in existing §290.110(d)(5) also apply to the groundwater systems that must meet the requirements of this section.

The commission adopts new §290.116(c)(3)(E)(i) to specify that the analytical requirements for measuring chlorine dioxide residual using amperometric titration as defined in existing §290.110(d)(5)(A) also apply to the groundwater systems that must meet the requirements of this section.

The commission adopts new §290.116(c)(3)(E)(ii) to specify that the analytical requirements for measuring chlorine dioxide residual using Lissamine Green B as defined in the federal GWR in 40 CFR §141.74(a)(2) also apply to the groundwater systems that must meet the requirements of this section.

The commission adopts new §290.116(c)(3)(F) to specify that the analytical requirements for measuring ozone residual as defined in the federal GWR in 40 CFR §141.74(a)(2) also apply to the groundwater systems that must meet the requirements of this section.

The commission adopts new §290.116(d) establishing the reporting requirements for groundwater systems required to meet the criteria of this section as required by the federal GWR in 40 CFR §141.405.

The commission adopts new §290.116(d)(1) establishing the treatment reporting requirements for groundwater systems required to meet the 4-log treatment of viruses as required by 40 CFR §141.405(a)(1).

The commission adopts new §290.116(d)(2) establishing the notification requirements for groundwater systems achieving 4-log treatment of viruses that are not subject to raw groundwater source monitoring as required by 40 CFR §141.403(b). This paragraph also establishes the December 1, 2009 deadline for this notification.

The commission adopts new §290.116(d)(3) requiring groundwater systems to notify the executive director within 30 days of completing the required corrective action in accordance with the federal GWR in 40 CFR §141.405(a)(2).

The commission adopts new §290.116(d)(4) requiring a groundwater system that fails to conduct triggered source monitoring to provide written documentation that it was providing 4-log treatment of

viruses within 30 days of the positive distribution coliform sample. This paragraph incorporates the requirements of the federal GWR in 40 CFR §141.405(a)(3).

The commission adopts new §290.116(e) establishing the compliance determination requirements for groundwater systems required to meet the criteria of this section as required by the federal GWR in 40 CFR §141.404.

The commission adopts new §290.116(e)(1) to incorporate 40 CFR §141.404(b)(1) establishing the violation of the treatment technique requirement if a groundwater system does not complete corrective action in accordance with the executive director approved corrective action plan or interim measures required by the executive director.

The commission adopts new §290.116(e)(2) to incorporate 40 CFR §141.404(b)(2) establishing the violation of the treatment technique requirement if a groundwater system is not in compliance with the executive director approved corrective action plan and schedule.

The commission adopts new §290.116(e)(3) to incorporate 40 CFR §141.404(c) establishing the violation of the treatment technique requirement if a groundwater system fails to maintain at least 4-log treatment of viruses and the failure is not corrected within four hours.

The commission adopts new §290.116(e)(4) establishing the monitoring violation for groundwater systems that fail to conduct the required disinfectant monitoring.

The commission adopts new §290.116(e)(5) establishing the reporting violation for groundwater systems that fail to report the results of the required disinfectant monitoring.

The commission adopts new §290.116(e)(6) establishing a public notice violation for groundwater systems that fail to issue required public notice.

The commission adopts new §290.116(f) to incorporate the federal GWR in 40 CFR §141.404(d) establishing the public notice requirement for treatment technique, monitoring, or reporting violations as given in this section.

Section 290.117, Regulation of Lead and Copper, contains the action levels, sampling requirements, reporting requirements, and public education requirements for lead and copper, which can be released into drinking water under corrosive conditions. The commission adopts §290.117 to add references to elements added elsewhere as part of the incorporation of new federal requirements, to remove references to effective dates that have passed, to correct internal references, and to correct typographical and syntax errors.

The commission adopts §290.117(b) to remove initial capital letters within the catchline, in accordance with agency syntax protocols. The commission deletes the table in §290.117(c)(8) because it contains references to start dates for lead and copper monitoring that have passed and all Texas public water systems have completed the initial monitoring referred to in that table. In §290.117(d), the commission removes initial capital letters within the catchline, in accordance with agency standards. Throughout §290.117(h) internal references to the table setting the number of water quality parameter monitoring

locations are corrected from §290.117(c)(8) to §290.117(h)(1)(D). The word "title" in §290.117(h)(1)(D) is replaced with the word "section" to meet agency syntax standards.

Section 290.118, Secondary Constituent Levels, contains the existing secondary, non-health-based standards in drinking water. The commission adopts the reference to certified laboratories in §290.118(d) to reflect that authority for certification of drinking water laboratories under the Safe Drinking Water Act has passed from the (then) Texas Department of Health to the TCEQ.

Section 290.119, Analytical Procedures, contains the analytical methods that are acceptable for compliance sampling of drinking water. The commission adopts §290.119(b) to update the name of the agency from "Texas Natural Resource Conservation Commission" to "Texas Commission on Environmental Quality." In response to comment, the commission has updated its references as follows: in §290.119(a)(1), the commission made a conforming change by adding a reference to 30 TAC Chapter 25 for lab certification or accreditation, consistent with 40 CFR §141.131(b)(2); in §290.119(b)(2), the commission changed a reference from 40 CFR §141.22(a) to §141.74(a)(1); in §290.119(b)(3), the commission made a conforming change by changing the reference from 40 CFR §141.23(f) to §141.23(k); in §290.119(b)(6), the commission added a reference to 40 CFR §141.131(a) for DBP methods; in §290.119(b)(7), the commission made a conforming change by adding a reference to 40 CFR §141.74(b) for ozone disinfectant; in §290.119(b)(8), and, the commission added the words "bromide and magnesium", consistent with 40 CFR §141.131(d)(2). In response to comment, the commission added new §290.119(c) to define the term "detection" by reference to 40 CFR §141.151(d).

Section 290.121, Monitoring Plans, contains the requirements for systems to use a monitoring plan to describe when and where they take compliance samples.

The commission updates the internal references in §290.121(b)(1) to reflect inclusion of the new federal rule requirements. The commission changed §290.121(b)(5) to make conforming changes to match federal language. The requirement of 40 CFR §141.622(a)(1) relating to revision date was not in the commission's proposed rule so the following sentence was added: "The monitoring plan must be revised to show Stage 2 sample sites by the date shown in table 290.115(a)(2) entitled Date to Start Stage 2 Compliance." The commission adopts new §290.121(b)(6) to add a reference to the source water monitoring plans required under the federal GWR in 40 CFR §141.402(a)(2)(ii). The commission adopts new §290.121(b)(7) to add a reference to initial distribution system evaluation plans under the federal DBP2 in 40 CFR §141.600(1). The commission adopts new §290.121(b)(8) to add a reference to the raw water monitoring plans required under the federal LT2 in 40 CFR §141.703(f). The commission removes outdated references to effective dates starting in 2001, 2003, and 2004 from existing §290.121(c)(1) - (3) and renumbers resulting paragraphs. The commission updates §290.121(d)(1) specify that a reporting violation occurs not only when a system fails to submit a monitoring plan upon request, but also if it is required to submit its monitoring plan because it treats surface water or groundwater under the direct influence of surface water.

Section 290.122, Public Notification, contains public notification requirements for systems to follow when their drinking water fails to meet one of the drinking water standards.

The commission adopts §290.122 to add references to elements added elsewhere as part of the incorporation of new federal requirements, to correct internal references, and to correct typographical and syntax errors. The commission made a conforming change to §290.122 to include the allowance of 40 CFR §141.201(c)(2) for limiting notification to the part of the distribution system impacted by the event causing the notification.

The commission adopts the amendment to §290.122(a)(1)(B) which removes capitalization of the words from the term "Nephelometric Turbidity Unit" and incorporates public notification requirements of the federal PNR. The commission adopts new §290.122(a)(1)(B)(i) to contain the requirement of existing §290.122(a)(1)(B) regarding notification when combined filter effluent turbidity is over 5.0 NTU. The commission adopts new §290.122(a)(1)(B)(ii) to contain the requirement of the federal PNR in 40 CFR §141.202(a)(6) for notification when combined filter effluent turbidity is over 1.0 NTU at a membrane treatment plant. The commission adopts new §290.122(a)(1)(B)(iii) to contain the requirement of the federal PNR in 40 CFR §141.202(a)(6) for notification after consultation with the executive director when combined filter effluent turbidity is over 1.0 NTU at a treatment plant using technology other than membranes. The commission adopts new §290.122(a)(1)(B)(iv) to contain the requirement of the federal PNR in 40 CFR §141.202(a)(6) for notification of customers in cases where a system fails to consult with the executive director when combined filter effluent turbidity is over 1.0 NTU at a treatment plant using technology other than membranes.

The commission adopts new §290.122(a)(1)(F) to incorporate the provisions of the federal GWR in 40 CFR §141.202(a)(8) requiring groundwater systems to notify the public of detection of *E. coli* or other

fecal indicators in raw groundwater source samples as an acute health violation. The subsequent paragraph is re-alphabetized to maintain alphabetical order.

The commission adopts new §290.122(b)(1)(C) to incorporate the provisions of the federal GWR in 40 CFR §141.403(a) requiring groundwater systems to notify the public of failure to take corrective action or failure to maintain at least 4-log treatment of viruses before or at the first customer. The subsequent paragraphs are re-alphabetized to maintain alphabetical order.

The commission adopts new §290.122(b)(1)(D) to incorporate the provision of the federal LT2 in 40 CFR §141.211(a) that a system must notify customers if they fail to collect three months of required *Cryptosporidium* data. The commission amended proposed §290.122(b)(1)(D) by adding the phrase "or request bin classification from the executive director under §290.111(c)(3)(A)" and by adding an additional reference to §290.111(c)(3)(A) to conform with federal LT2 rule in 40 CFR §141.211(b).

The word "*fluoride*" was spelled incorrectly in §290.122(c)(1)(A). The commission has corrected the spelling.

The commission adopts new §290.122(d)(3)(C) to incorporate the provision of the federal LT2 in 40 CFR §141.211(d)(1), which requires surface water systems to include the mandatory contaminant-specific language in addition to any language required by the executive director, when notifying the public of repeated failure to conduct surface water source monitoring for *Cryptosporidium*. The commission amended proposed §290.122(d)(3)(C) by adding the phrase "or request bin classification from the executive director" to conform with federal LT2 rule and by adding the reference to 40 CFR

§141.211(d)(2). The commission also deleted an extraneous reference to §290.111(b). Because of these changes, the commission also renumbered existing §290.122(d)(3)(C) to (D).

The commission adopts §290.122(f) to incorporate the provisions of the federal PNR 40 CFR §141.31(d) requiring a signed certificate of delivery with proof of public notification submitted to the executive director.

The commission added §290.122(i) to authorize the executive director to allow systems to notify only those customers in the area impacted by a drinking water quality problem rather than notifying all customers, including those not affected. The commission made this change to conform to the federal public notice rule in 40 CFR §141.201(c)(2).

Subchapter H: Consumer Confidence Reports

Subchapter H contains the requirements for community water systems to deliver a report of drinking water quality, called a Consumer Confidence Report, to all of their customers annually. The commission amends Subchapter H, Consumer Confidence Reports, to incorporate provisions of the federal GWR, LT2, and GWR rules. Since 1998, all public water systems have been required to send their customers and annual report of drinking water quality called the Consumer Confidence Report. All new regulations from EPA, such as the GWR, LT2, and DBP2, contain provisions for how to notify customers regarding any new contaminants or new ways of calculating compliance. The commission also adopts administrative changes throughout these sections to be consistent with Texas Register requirements and with Subchapter D and Subchapter F of Chapter 290.

Section 290.272, Content of the Report, describes the required contents of the consumer confidence reports.

The commission adopts new §290.272(c)(4)(D)(iii) requiring systems to include the highest locational running average and range of individual sample results for total trihalomethanes and haloacetic acids for all monitoring locations expressed in the same units as the MCL, consistent with the federal DBP2 in 40 CFR §141.53(d)(4)(iv)(B).

The commission adopts new §290.272(e)(7) to incorporate the provisions of the federal DBP2 in 40 CFR §141.153(d)(4)(iv)(c) requiring systems to include individual sample results in calculations for the initial distribution system evaluation to be reported in the annual consumer confidence report.

The commission adopts new §290.272(g)(7) to incorporate the provisions of the federal GWR in 40 CFR §141.53(h)(6)(i) require inclusion in the consumer confidence report of any fecal indicator-positive groundwater source sample that is not invalidated by the executive director.

The commission adopts new §290.272(g)(7)(A) to incorporate the provisions of the federal GWR in 40 CFR §141.53(h)(6)(i)(A) that a system must notify its customers of the source of any fecal contamination, if that source is known, and notify them of the dates that the fecal indicator was detected in the source. The commission adopts new §290.272(g)(7)(B) to incorporate the provisions of the federal GWR in 40 CFR §141.53(h)(6)(i)(B) that a system must notify its customers of any actions that have been taken to address the fecal contamination, and the date of such action. The commission adopts new §290.272(g)(7)(C) to incorporate the provisions of the federal GWR in 40 CFR §141.53(h)(6)(i)(C) that a

system must notify its customers of the plan to address any fecal contamination and any progress that has been made towards addressing the contamination. The commission adopts new §290.272(g)(7)(D) to incorporate the provisions of the federal GWR in 40 CFR §141.53(h)(6)(i)(D) that a system must notify its customers using the mandatory health effects language.

The commission adopts new §290.272(g)(8) to incorporate the provisions of the federal GWR in 40 CFR §141.53(h)(6)(i) to require the consumer confidence report to describe any significant deficiency. The commission adopts new §290.272(g)(8)(A) to incorporate the provisions of the federal GWR in 40 CFR §141.53(h)(6)(i)(A) that a system must notify its customers of any significant deficiency and the date that it was identified. The commission adopts new §290.272(g)(8)(B) to incorporate the provisions of the federal GWR in 40 CFR §141.53(h)(6)(i)(B) that a system must notify its customers of their plan for addressing any significant deficiency. The commission adopts new §290.272(g)(8)(C) to incorporate the provisions of the federal GWR in 40 CFR §141.53(h)(6)(ii) that a system must notify its customers of any significant deficiency that was corrected and the date that it was corrected. Significant deficiencies are part of the special primacy conditions for the state of 40 CFR Part 142. This requires states to define at least one significant deficiency related to each of the eight sanitary survey elements: source, treatment, distribution, storage facilities, pressure maintenance facilities, data reporting, system management, and operator compliance with licensing.

Section 290.273, Required Additional Health Information, provides the required additional health information that must be included in consumer confidence reports.

The commission adopts §290.273(b) to remove the transition level and language for reporting arsenic levels consistent with the requirements of 40 CFR §141.154 because applicability has passed.

Section 290.275, Appendices A - D, provides the mandatory language used to explain contaminant detections and violations in the consumer confidence reports.

Section §290.275(1) is Figure: 30 TAC §290.275(1), Appendix A--Converting Maximum Contaminant Level Compliance Values for Consumer Confidence Reports. The commission adopts §290.275(1) to insert the language of 40 CFR Appendix A to Subpart O relating to the maximum contaminant compliance value for fecal indicators of drinking water as number 3. Subsequent table elements are renumbered to maintain the table sequence.

The commission removes footnote 1 of §290.275(1) related to the effective date of the arsenic MCL since this date has passed.

Section 290.275(2) is Figure: 30 TAC §290.275(2), Appendix B--Sources of Regulated Contaminants. The commission adopts §290.275(2) to insert the language of the federal GWR in 40 CFR Appendix A to Subpart O relating to the source of fecal indicators of drinking water as number 3. Subsequent table elements are renumbered to maintain the table sequence.

The commission removes footnote 1 of §290.275(2) related to the effective date of the arsenic MCL which has passed.

Section 290.275(3) is Figure: 30 TAC §290.275(3), Appendix C--Health Effects Language. The commission adopts §290.275(3) to insert the health effects language of the federal GWR in 40 CFR Subpart O, Appendix A relating to the mandatory health effects language for fecal indicators in drinking water as number 3. Subsequent table elements are renumbered accordingly to maintain the table sequence.

FINAL REGULATORY IMPACT ANALYSIS DETERMINATION

The commission reviewed the adopted rulemaking in light of the regulatory analysis requirements of Texas Government Code, §2001.0225, and determined that the rulemaking does not meet the definition of a "major environmental rule" as defined by that statute. A "major environmental rule" means a rule the specific intent of which is to protect the environment or reduce risks to human health from environmental exposure and that may adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state. This rulemaking does not meet the statutory definition of a "major environmental rule" because, while the rule is intended to reduce risks to human health from environmental exposure, it does not adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state.

The specific intent of the adopted amendments is to incorporate recent changes in the federal drinking water regulations in order to maintain the state's primary enforcement responsibility with regard to drinking water. This is accomplished by enacting rules no less stringent than the federal regulations and adopting adequate procedures for implementation and enforcement of those rules. The adopted amendments require drinking water systems to meet the same regulatory standards set forth in the federal rules, while providing alternative approaches to compliance based in part on stakeholder input during

meetings held on September 26, 2006; October 24, 2006; November 14, 2006; and, January 9, 2007, and taking into account special considerations related to this state's particular source water conditions. The federal regulations that would be implemented through the adopted amendments are designed to reduce risks to human health from environmental exposure by limiting public exposure to waterborne disease and enhancing the public's awareness of contamination of its drinking water.

This rulemaking does not meet the statutory definition of a "major environmental rule" because the adopted amendments would not adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, or public health and safety of the state or a sector of the state. It is not anticipated that the cost of complying with the adopted amendments will be significant with respect to the economy as a whole; therefore, the adopted amendments will not adversely affect in a material way the economy, a sector of the economy, competition, or jobs.

The adopted amendments to §290.46 resulting from changes made to the THSC during the 79th Regular Session by SB 9 require a public water system to maintain internal procedures to notify the executive director in the event of a threat to the security of the water supply. This adopted provision gives the water supply system wide latitude in how it chooses to comply with the rule; it does not require the system to incur any costs in the development of this plan, nor does it require publication or distribution of the plan. Therefore, development and maintenance of the plan will result in little or no fiscal impact to a water supply system or its customers.

The adopted amendments resulting from the federal TCR and PNR will have no fiscal impact on the regulated community or its customers. The language of these rules is being amended to more accurately

reflect the federal rules. Because the agency's current methods of implementation comply with the federal rules, no changes to state implementation will result from the amendments. The revisions to the PNR are required by EPA to maintain primacy.

Existing §290.113, Disinfection By-products (TTHM and HAA5), contains the standards for disinfection by-products resulting from DBP1 promulgated by the EPA in December 1998. This rule package adopts amendments that would add the requirements of DBP2 promulgated by the EPA in January 2006. Amendments to DBP1 adopted by this rulemaking would change references so that the Chapter 290 rules distinguish between the DBP1 and DBP2 rules. Because these amendments result in no changes in implementation, they will result in no fiscal impact to the regulated community.

This rulemaking does not qualify as a major environmental rule because it will not have an adverse economic effect. Additionally, this rulemaking does not meet the definition of a major environmental rule because it does not meet any of the four applicability requirements listed in Texas Government Code, §2001.0225(a). Texas Government Code, §2001.0225 only applies to a major environmental rule, the result of which is to: 1) exceed a standard set by federal law, unless the rule is specifically required by state law; 2) exceed an express requirement of state law, unless the rule is specifically required by federal law; 3) exceed a requirement of a delegation agreement or contract between the state and an agency or representative of the federal government to implement a state and federal program; or 4) adopt a rule solely under the general powers of the agency instead of under a specific state law. This rulemaking does not meet any of these four applicability requirements because this rulemaking: 1) does not exceed any standard set by federal law for treatment of water used in public water systems and is consistent with federal rules; 2) does not exceed the requirements of state law under Texas Health and Safety Code,

Chapter 341, Subchapter C; 3) does not exceed a requirement of a delegation agreement or contract between the state and an agency or representative of the federal government to implement any state and federal program on treatment of water used in public water systems, but rather is adopted to be consistent with federal rules in order to allow the state to maintain its authority to implement the federal Safe Drinking Water Act, pursuant to the agreements between the EPA and TCEQ; and 4) is not adopted solely under the general powers of the agency, but rather specifically under Texas Health and Safety Code, §341.031, which allows the commission to adopt and enforce rules to implement the federal Safe Drinking Water Act, as well as the other general powers of the agency.

The commission invited public comment of the draft regulatory impact analysis determination. No comments were received on the draft regulatory impact analysis determination.

TAKINGS IMPACT ASSESSMENT

The commission evaluated the adopted amendments to Chapter 290 and performed an assessment of whether the amendments would constitute a taking under Chapter 2007 of the Texas Government Code. The primary purposes of the adopted amendments are to incorporate federal regulations related to: 1) protecting public drinking water consumers from the risks of disinfectant byproducts more equitably than previous rules in response to the National Primary Drinking Water Regulations: DBP2 published by the EPA in the January 4, 2006 issue of the *Federal Register*; 2) providing increased public health protection from the protozoan *Cryptosporidium* in drinking water in response to the National Primary Drinking Water Regulations: LT2 published by the EPA in the January 5, 2006 issue of the *Federal Register*; and 3) providing greater protection from pathogens for customers of public water systems that operate wells through new monitoring, reporting, and compliance requirements, in response to National Primary

Drinking Water Regulations: GWR, published in the November 8, 2006 issue of the *Federal Register*. Additional amendments are adopted to: 1) require by rule certification of public notice in order to gain primacy over the PNR adopted by the TCEQ in 2002; 2) address security issues at public water systems through rulemaking related to policy and response planning in response to Senate Bill 9, 79th Legislature, 2005; 3) update system design requirements to reflect current technology; 4) add requirements for consumer confidence reports relating to the new rules; 5) ensure consistency with the existing federal TCR and DBP1; and 6) correct any typographical errors, formatting mistakes, incorrect references, or citation changes identified through review of the rule language and delete references to compliance initiation dates that have already passed and make other non-substantive changes. The adopted amendments would substantially advance these purposes by amending notice, reporting, and licensing requirements and adding new technology options to Chapter 290, and making non-substantive changes.

The commission's analysis indicates that Texas Government Code, Chapter 2007 does not apply to these adopted rules because this is an action that is reasonably taken to fulfill an obligation mandated by federal law, which is exempt under Texas Government Code, §2007.003(b)(4). In order to maintain primacy over public drinking water, the state must enact rules no less stringent than the federal drinking water regulations as required by 40 CFR §142.10. Further, Texas Government Code, Chapter 2007 does not apply to these adopted rules because this is an action that is taken in response to a real and substantial threat to public health and safety; that is designed to significantly advance the health and safety purpose; and that does not impose a greater burden than is necessary to achieve the health and safety purpose. Thus, this action is exempt under Texas Government Code, §2007.003(b)(13). The adopted rules are designed to ensure that drinking water for public consumption is treated and monitored sufficiently to

minimize exposure to waterborne disease. The adopted rules are designed to accomplish this goal without imposing unnecessary burdens.

Promulgation and enforcement of the adopted amendments would constitute neither a statutory nor a constitutional taking of private real property. There are no burdens imposed on private real property under this rule because the adopted amendments neither relate to, nor have any impact on the use or enjoyment of private real property, and there would be no reduction in property value as a result of this rule. The rule requires public drinking water system to comply with drinking water standards protective of human health and the environment and brings those standards in concurrence with those of the corresponding federal regulations. Therefore, the adopted rules would not constitute a taking under Texas Government Code, Chapter 2007.

CONSISTENCY WITH THE COASTAL MANAGEMENT PROGRAM

The commission reviewed the adopted rules and found that they are neither identified in Coastal Coordination Act Implementation Rules, 31 TAC §505.11(b)(2) or (4), nor will they affect any action/authorization identified in Coastal Coordination Act Implementation Rules, 31 TAC §505.11(a)(6). Therefore, the adopted rules are not subject to the Texas Coastal Management Program.

PUBLIC COMMENT

The commission held a public hearing for this rule on August 30, 2007 in Austin, Texas. The public comment period for this rulemaking closed on September 10, 2007. The commission received comments from Austin Water Utility (AWU), Environmental Protection Agency, Region 6 (EPA), International

Code Council Texas Field Office (ICCTx), South Tawakoni Water Supply Corporation (STWSC), TCB Incorporated (TCB), and TRA/TCRWSS (TRA).

AWU and TCB generally supported the rule. AWU, EPA, ICCTx, STWSC, TCB, and TRA suggested modifications to the proposed rules to clarify their applicability as stated in the RESPONSE TO COMMENTS section of this preamble.

RESPONSE TO COMMENTS

General

EPA commented that the following sections are consistent with the federal regulations cited (all references are to 30 TAC and 40 CFR:

Section 290.103(2), (6), (10), (18), (25), and (37) is consistent with 40 CFR §141.2; §290.103(2) is also consistent with 40 CFR §141.600(c)(2); §290.112(b)(2)(H) and (c)(5) is consistent with 40 CFR §141.135(a)(3)(ii); §290.113(c)(4)(A) - (C) is consistent with 40 CFR §141.132(b)(1)(iv); §290.114(b) is consistent with 40 CFR §141.64(a); §290.115(b) is consistent with 40 CFR §141.64(b)(2)(i); §290.115(c)(1)(A) is consistent with 40 CFR §141.600(b); §290.115(c)(5)(A) - (C) is consistent with 40 CFR §141.132(b)(1)(iv); §290.115(c)(5)(A) and (B) is consistent with 40 CFR §141.600(d)(1); §290.115(c)(5)(B) is consistent with 40 CFR §141.603(a)(1) - (4); Footnote 1 to Table §290.115(c)(5)(B) is consistent with the footnote to 40 CFR §141.603(a)(1) - (4); §290.115(c)(5)(B)(i) is consistent with 40 CFR §141.603(b)(1); §290.115(c)(5)(B)(ii) is consistent with 40 CFR §141.603(b)(2); §290.115(c)(5)(B)(iii) is consistent with 40 CFR §141.603(b)(3); §290.115(c)(5)(C) and its footnote are consistent with 40 CFR §141.600(c)(1)(i) - (v) and its footnote; §290.115(c)(5)(C)(i)(I) and (II) is

consistent with 40 CFR §141.601(a)(1); §290.115(c)(5)(C)(i)(II) is consistent with 40 CFR §141.601(a)(2); Footnote 1 to Table §290.115(c)(5)(C)(ii)(I) is consistent with 40 CFR §141.601(b)(3); §290.115(c)(5)(C)(iii)(I) and (II) is consistent with 40 CFR §141.601(c)(1); §290.115(c)(5)(C)(iii)(III) is consistent with 40 CFR §141.601(c)(2); §290.115(c)(5)(C)(iii)(IV) is consistent with 40 CFR §141.601(c)(3); §290.115(d) is consistent with 40 CFR §141.600(e); §290.115(f)(1)(E) is consistent with 40 CFR §141.600(f); §290.119(b) is consistent with 40 CFR §141.131(d)(3), (4)(i) and (ii), and (6); §290.272(c)(4)(D)(iii) is consistent with 40 CFR §141.153(d)(4)(iv)(B); and, §290.272(e)(7) is consistent with 40 CFR §141.153(d)(4)(iv)(C).

The commission acknowledges the EPA's comments. No changes have been made in response to these comments.

STWSC commented that extreme weather conditions in Texas, like drought, low lake levels, and wet summer conditions could not have been considered when the EPA promulgated the disinfection by-products rule. STWSC understands that the EPA allows a ±15% margin of error in lab testing for disinfection by-products. STWSC requests that especially because of extreme weather conditions all affected surface water entities should be provided at least a 5% compliance operating margin {total trihalomethanes (TTHM) and haloacetic acids-group of five (HAA5)}.

The commission responds that in the preamble to the DBP2 rule published in the January 4, 2006, *Federal Register*, on page 394 through page 408, EPA considered epidemiological studies in which weather was an intrinsic variable impacting disinfection by-product levels and based the maximum contaminant levels (MCLs) for disinfection by-products, in part, on these studies. The federal rules

provide maximum contaminant levels (MCLs) for TTHM and HAA5 of 80 and 60 micrograms per liter, respectively, without any compliance operating margin. Under 40 CFR §142.10(b), a state must adopt rules no less stringent than the corresponding federal rules in order to maintain primacy over its public drinking water program. By providing at least a 5% compliance operating margin, the rules would be less stringent than the federal rules. The adopted rules reflect the MCLs for TTHM and HAA5 specified by federal regulations. No changes have been made in response to this comment.

SUBCHAPTER D: RULES AND REGULATIONS.

§290.38. Definitions.

EPA commented that the definitions for "bank filtration", "flowing stream", "lake/reservoir", "membrane filtration", "plant intake", "presedimentation", and "two-stage lime softening" are not contained in §290.38.

The commission responds that under 40 CFR §142.10(b), a state must adopt rules no less stringent than the corresponding federal rules in order to maintain primacy over its public drinking water program. Thus the commission must adopt rules that contain the definitions found in the federal rules at 40 CFR §141.2. To include all definitions contained in 40 CFR §141.2 the following statement is contained in §290.38, "If a word or term used in this chapter is not contained in the following list, its definition shall be as shown in Title 40 Code of Federal Regulations (CFR)

§141.2." Therefore all of the definitions cited in the comment are adopted by reference in §290.38. No changes were made in response to this comment.

ICCTx commented that the definition of uniform fire code in adopted §290.38(73) should be revised from "Uniform Fire Code--The standards of the International Conference of Building Officials, 5360 Workman Mill Road, Whittier, California, 90601-2298." to the "International Fire Code--The standards of the International Code Council, 500 New Jersey Avenue, NW, 6th Floor, Washington, DC 20001."

The commission agrees with this comment and the suggested change has been made. The reference was changed in §290.42(e)(4)(C) from "Uniform Fire Code (UFC)" to "International Fire Code (IFC)" to reference the Fire Code currently adopted in Texas. Additionally, "UFC" is also referenced in §290.42(e)(6). The commission has changed this reference to "IFC."

§290.42. Water Treatment.

AWU commented that §290.42(g)(4) states that a 2-log removal credit is given for bag, cartridge and membrane systems installed before April 1, 2012 however this should be a 3-log removal.

The commission responds that the 3-log removal credit is correct for *Giardia* as specified by 40 CFR §141.70. However, the 2-log removal credit is correct for *Cryptosporidium* as specified by 40 CFR §141.170 and 40 CFR §141.500. The commission amended the rule to clarify that these technologies can receive up to 2-log removal credit for *Cryptosporidium* and 3-log removal credit for *Giardia*.

TCB commented that there is an expanding chasm between monitoring requirements in Subchapter F and the identified technologies' design criteria in Subchapter D. This chasm requires more technologies to be reviewed through the commission's innovative treatment approval process. TCB asked why the explicit design and operational criteria for certain technologies in §290.42(g), Other Treatment Processes, is not in another section related to design criteria or operational criteria.

The commission responds the chasm between monitoring requirements in Subchapter F and the design criteria of Subchapter D exists because the federal rules contain relatively few design criteria but often contain precise monitoring, reporting, and performance criteria. Under 40 CFR §142.10(b), a state must adopt rules no less stringent than the corresponding federal rules in order to maintain primacy over its public drinking water program. The commission's regulatory approach provides systems with design flexibility where the federal rules are not prescriptive. The commission acknowledges that there are many ways to organize the rules. The commission has chosen to include the specific design criteria for unconventional filtration and ultraviolet disinfection, which are taken directly from the federal LT2 rule in 40 CFR §141.719 and 40 CFR §141.120, under §290.42(g). By placing these criteria in §290.42(g) the commission provides a section that consolidates both the federal requirements and other information the system needs to evaluate and select its technology. For example, a system considering membrane technology needs to be aware of site-specific piloting and capacity determination requirements during the planning phase of technology selection. By including design specifics in this subsection, those specifics are organizationally close to the site-specific pilot testing requirements also in this subsection. No change has been made in response to this comment.

§290.46. Minimum Acceptable Operating Practices for Public Drinking Water Systems.

EPA commented that the recordkeeping requirements described in 40 CFR §141.722 could not be located in the proposed rules.

The commission responds that under 40 CFR §142.10(b), a state must adopt rules no less stringent than the corresponding federal rules in order to maintain primacy over its public drinking water program. Thus, the commission proposed rules that contain the recording keeping requirements found in the federal rules in 40 CFR §141.722. The recordkeeping requirements for each federal citation are located as follows: 40 CFR §141.722(a) is located in §290.46(f)(3)(b)(vii) and 40 CFR §141.722(b) is located in §290.46(f)(3)(b)(viii). The commission responds that the recordkeeping requirement in 40 CFR §141.722(c), which is located in §290.46(f)(3)(B)(ix) for microbial toolbox sampling results, could be confused with the IFE and CFE turbidity recordkeeping requirements found in §290.46(f)(3)(B)(iv) and (E)(i), respectively, and might not be construed as meeting the requirement of 40 CFR §141.722(c). To remove this confusion, the commission described what turbidity records need to be kept in §290.46(f)(3)(b)(ix) to differentiate the microbial toolbox sampling results from the other turbidity results currently reported to the commission.

EPA commented that monitoring plans must be retained by a public water system for ten years, consistent with 40 CFR §141.33(f).

The commission agrees with this comment and has changed §290.46 to conform with 40 CFR §141.33(f) by moving the requirement for monitoring plans from §290.46(f)(3)(D), which lists

records that must be kept for five years, to §290.46(f)(3)(E), which lists records that must be kept for ten years, to be consistent with the federal requirements.

EPA commented that the record retention requirements for IDSE only included IDSE plans whereas it also should have included IDSE reports and other compliance documentation consistent with 40 CFR §141.601(a)(4).

The commission agrees with this comment and has revised §290.46(f)(3)(E)(v) to include the retention time requirements for all IDSE documentation to conform with 40 CFR §141.601(a)(4).

§290.47. Appendices.

SUBCHAPTER F: DRINKING WATER STANDARDS GOVERNING DRINKING WATER QUALITY AND REPORTING REQUIREMENTS FOR PUBLIC WATER SYSTEMS.

§290.103. Definitions.

TCB commented that new §290.103(6) uses the undefined term "direct connection" and requests asks if the commission intends to expand or limit the definition of consecutive system.

The commission agrees that the use of the term "direct connection" within the definition of "consecutive system" is undefined. The language, which was incorporated from the federal rule, was intended to clarify but not expand or limit the term "consecutive system." In Texas, direct connection has been interpreted to mean "direct pressure connection." As this has the potential to cause confusion, the commission has removed the sentence containing the reference to "direct

connection" from this definition. The commission added the phrase "other public water" and removed the word "wholesale." The commission made these changes to explain how systems may be interconnected to meet the definition of "consecutive systems" without using the term "direct connection."

AWU commented that new §290.103(29) does not define operational evaluation level but merely states what is done when the level is exceeded. AWU suggested adding a reference to §290.115(b)(2), which defines the level and how it is calculated.

The commission agrees with this comment and has included the language from §290.115(b)(2).

TCB commented that new §290.103(37), wholesale system, leaves open the question of how to define a water system which may be providing unfinished, raw water as a wholesale provider. TCB suggested that the commission may need to address this in its definitions.

The commission responds that the definition for "wholesale system" incorporated in the commission's proposed rule was from the federal rule. However, the federal rule does not include many requirements that Texas systems must meet, such as disinfection of groundwater. Instead of adopting the federal language, the commission has changed the proposed definition of the term "wholesale system" to accurately reflect how the term is used in Texas.

§290.109. Microbial Contaminants.

TCB commented that new §290.109(b)(1)(A) - (C), appeared to contain an error in the statement "the MCL is achieved when" and suggest that the TCEQ revise this phrase to "the MCL is violated when."

The commission responds that there is not an error with the language "the MCL is achieved when," however, the commission notes that the word "achieved" can be interpreted many ways. The commission intended for this section to define the MCL. To clearly state the MCL, the commission changed the rule language from "achieved when" to "defined as."

TRA commented that the rule should require a purchased water system to take one additional coliform sample where the system's water supplier connects to the distribution each day that a routine distribution coliform sample is taken. If that additional sample comes back positive, the purchased water system must notify its provider within the 24-hour period so the provider can test its wells. If the provider's results come back negative, the purchased water system will know that the problem lies with its own system and not with the provider's source; thus, the system responsible can begin immediate corrective actions.

The commission responds that under 40 CFR §142.10(b), a state must adopt rules no less stringent than the corresponding federal rules in order to maintain primacy over its public drinking water program. If this suggestion were implemented, it would relieve groundwater suppliers of their responsibility under federal rule to take raw fecal indicator samples after a coliform-positive distribution sample in a purchaser's system, which is required under the federal rule. In order to remain as stringent as the federal rules, no change has been made in response to this comment.

TCB commented that §290.109(c)(4) should be made into a separate paragraph (d) to distinguish the distribution monitoring requirements for raw groundwater source monitoring regulations.

The commission disagrees with this comment. The raw water monitoring required under the GWR in 40 CFR §141.402, is additional repeat monitoring performed as a result of routine distribution monitoring, therefore they are intrinsically linked and need to remain in the same subsection. No change has been made in response to this comment.

TCB commented that the requirements for requesting invalidation of a routine distribution coliform positive sample should not be included in the §290.109(d) because they are not related to analytical requirements.

The commission responds that §290.109(d) contains both invalidation and analytical requirements. These are placed together because they are both related to the validity of the sample results. To reduce confusion regarding the contents of the subsection, the commission has modified the catchline from "Analytical requirements for microbial contaminants" to "Analytical and invalidation requirements for microbial contaminants" to more accurately reflect the contents of this subsection.

TCB commented that new §290.109(g)(2) refers to a public groundwater system receiving a valid *E. coli* or other fecal indicator positive source sample. TCB questioned what is "valid" in this sentence. TCB also suggested the commission needs to note what tier violation this is within the paragraph.

The commission agrees that the use of the modifier "valid" is confusing because it is inconsistent with other rule sections, which refer to "sample(s) that (have) not been invalidated." The rule language has been revised to remove the modifier "valid" and to refer instead to a sample "that has not been invalidated" for clarity and consistency. The commission declines to make the suggested change to note the tier violation, however it agrees that the urgency of notification required should be noted within this paragraph, as suggested by the commenter. Incorporating the notice timeframe from §290.122(a) into this paragraph facilitates the issuance of timely public notice because the system will not be required to refer to a different rule section to find the appropriate notice timeframe. Therefore, the rule has been revised to provide that a public groundwater system must notify the water system customers of a positive source sample within 24 hours.

TCB commented that in §290.109(g)(3) there is a typographical error between "*E. coli*" and "present" in the second line.

The commission verified that there was a space between "*E. coli*" and "present." No change has been made in response to this comment.

§290.111. Surface Water Treatment.

AWU commented that during June 2002 through June 2004 it has performed the LT2 rule's Schedule 1 *Cryptosporidium* monitoring and submitted the data to the EPA under the grandfathered provisions of the federal LT2 rule. AWU stated that the EPA indicated by email their acceptance of the data for compliance and that AWU will be in Bin 1 of the treatment requirements. AWU commented that their understanding is that the EPA staff will hand off the compliance data once this rule package is final. AWU commented

that it is their understanding that the TCEQ has a Memorandum of Understanding with the EPA addressing early rule implementation however the TCEQ's proposed rule changes do not address LT2 rule compliance process for Schedule 1, 2, and 3 systems. AWU commented that the TCEQ should perform early implementation of the LT2 rule just as the commission has for the Stage 2 rule.

The commission responds that the federal rule explicitly allows grandfathering. As the commission adopts rules as stringent as the federal rules, the commission has adopted by reference the grandfathering provisions in the federal rule, contained in 40 CFR §141.707. The commission will use the data provided to the EPA and accept the EPA's bin classifications assigned by the EPA during its early implementation period. The systems on Schedules 1, 2, and 3 will be classified by the EPA. The commission will classify Schedule 4 and any other systems not classified by the EPA. The commission continues to work closely with the EPA on bin classifications to ensure consistency. EPA is performing the early implementation activities of LT2 for Schedules 1, 2, and 3. No change has been made in response to this comment.

EPA commented that the reporting requirements described in 40 CFR §141.721 could not be located in the proposed rules.

Under 40 CFR §142.10(b), a state must adopt rules no less stringent than the corresponding federal rules in order to maintain primacy over its public drinking water program. Thus, the commission proposed rules that contain the reporting requirements found in the federal rules in 40 CFR §141.721. The reporting requirements for each federal citation are located as follows: 40 CFR §141.721(a) is located in §290.111(b)(1) - (3), (7)(A), and (c)(4); 40 CFR §141.721(b) and (d) is not

applicable because the commission does not allow uncovered finished water storage facilities; 40 CFR §141.721(e) is located in §290.111(d)(2)(B), (h)(2) and (3); and, 40 CFR §141.721(f) is located in §290.111(h)(7) - (9). The commission agrees that the requirement to report bin classification found in 40 CFR §141.721(c) is not explicitly stated in the proposal. To maintain primacy the requirement has been added to §290.111(h)(10) and the subsequent paragraph has been renumbered.

EPA commented that all of the microbial toolbox options found in 40 CFR §141.715 were not explicitly stated in the proposed rules.

The commission responds that the microbial toolbox options of source water protection, combined filter performance, individual filter performance, demonstration of performance, bag or cartridge filters (individual or in series), membrane filtration, second stage filtration, chlorine dioxide, ozone and ultraviolet light and the requirements for their use are explicitly stated in §290.111(c)(6) and (g)(4). Section 290.111(g)(4) specifically allows all other options to be considered by the executive director on a case-by-case basis. The remaining microbial toolbox options were discussed with stakeholders at the October 24, 2006 stakeholders' meeting and according to stakeholder input are not currently being used at PWSs in Texas. The commission is not aware of widespread interest in these other options. The commission's intent is to allow the use of all of the microbial toolbox options provided by EPA, but to only list the requirements for microbial toolbox options that will be used on a widespread basis in Texas. By listing a limited subset, the commission minimized the information in the rules making them easier to navigate. No change has been made in response to this comment.

EPA commented that the *E.coli* level that would require a PWS using groundwater under the direct influence of surface water (GUI) to conduct *Cryptosporidium* testing should be stated in the commission's proposed rules.

Under 40 CFR §141.701(a)(4)(iv) a PWS using GUI sources must sample *Cryptosporidium* if the *E. Coli* levels found are above the limits specified for the nearest water body type. The commission proposed rules that contain the requirement that PWS that use GUI sources sample for *Cryptosporidium* if the *E. coli* levels found are above limits specified for lakes/reservoirs. Under 40 CFR §142.10(b), a state must adopt rules no less stringent than the corresponding federal rules in order to maintain primacy over its public drinking water program. To achieve consistency with the federal rule, the commission changed the language of §290.111(b)(3)(B)(i) and (ii) to add a provision that would allow a system using a GUI source nearest to a river or flowing stream to only have to conduct *Cryptosporidium* sampling if the *E. coli* levels found exceed the levels for a source water intake on a river or flowing stream. This change allows systems using GUI sources all the options available in 40 CFR §141.701(a)(4)(iv)

EPA commented that §290.111(b)(3)(B) and (B)(iii) do not precisely reflect the requirements for sampling of smaller public water systems found in 40 CFR §141.701(a)(3)(i) and (4).

The commission agrees with the EPA's comment that, as written in the proposed language, the requirements are more stringent than the federal rule because they require smaller public water systems to take turbidity samples with the initial *E. coli* samples and to take turbidity and *E. coli*

samples in conjunction with *Cryptosporidium* samples. Under the federal rule, 40 CFR §141.701(a)(3)(i) and (4), smaller systems are not required to take these extra samples. The rule has been changed to be consistent with the federal rules by eliminating the turbidity samples during the initial *E. coli* sampling and the turbidity and *E. coli* samples during possible *Cryptosporidium* sampling for smaller public water systems.

AWU commented that the applicable CFR figures and tables should be included to provide for rule consistency and to eliminate ambiguity. AWU specifically noted that new §290.111(b) addresses two rounds of *Cryptosporidium* monitoring, however the timing found in the federal table contained in 40 CFR §141.701(c) is not clearly stated. Similarly, EPA commented that §290.111(b) should include a time table and a statement of when the proposed sampling schedule and locations are due from systems that place new sources into service.

The commission responds that it omitted the raw source water monitoring schedule for several reasons. First, several of the dates on which monitoring must commence have passed. Second, EPA has agreed to conduct early implementation activities for the first round of monitoring for all systems required to begin monitoring before October 1, 2008. And, third, while the federal table contained in 40 CFR §141.701(c) addresses existing sources, it does not address the monitoring schedule for new raw water sources; therefore, the commission proposed to instruct systems as to their monitoring schedules on a case-by-case basis. In response to comments, for the convenience of the regulated community and for consistency, the commission adopts new §290.111(b)(4)(A) to incorporate the table contained in 40 CFR §141.701(c) for existing sources, adopts new

§290.111(b)(4)(B) to address the monitoring schedule for new sources, and renumbers the subsequent paragraphs in §290.111(b)(4).

EPA commented that source water replacement sample timing could not be located in the commission's proposed rules.

The commission responds that under 40 CFR §142.10(b), a state must adopt rules no less stringent than the corresponding federal rules in order to maintain primacy over its public drinking water program. The commission responds that, in order to maintain primacy, it had proposed rules containing the source water replacement sample timing found in §141.702(b)(2)(ii) in proposed §290.111(b)(5). The rules require certain PWSs to submit replacement samples on a schedule approved by the executive director in §290.111(b)(5). This rule stipulates that "If, for any reason, the laboratory is unable to report a valid analytical result for a scheduled sample, the system must submit a replacement sample on a date approved by the executive director"; thus allowing the executive director to approve an alternative sampling date as specified in §141.702(b)(2)(ii). Because the source water replacement sample timing was included in the proposed rule, no changes were made in response to this comment.

AWU commented that the applicable CFR tables and calculation methods should be included to provide for rule consistency and to eliminate ambiguity. AWU noted that the commissions' proposed LT2 rules, unlike its DBP2 proposal, do not spell out the methods that the executive director would use to determine compliance with LT2 requirements.

The commission did not include the details of how the executive director would ensure compliance with federal requirements because it instead incorporated those details by reference to 40 CFR §141.710. Further, the information contained in 40 CFR §141.713(a), 40 CFR §141.713(c), and 40 CFR §141.713(d) is included in §290.111(c)(3)(B) in a more concise manner. The commission agrees that including additional details would benefit the regulated community and minimize confusion. To clarify the procedures that the executive director will use to determine compliance with bin classification requirements, the commission adopts §290.111(c)(3)(A)(i) -(v), which address the compliance calculations contained in 40 CFR §141.710(b). Similarly, to further explain the compliance timetable for meeting the new treatment technique requirements, the commission adopts new §290.111(c)(3)(B)(i) - (iii) which address the requirements of 40 CFR §141.713(a) and (c) and the analogous requirements for new raw surface water sources.

AWU commented that the figure §290.111(c)(3)(B) contained incorrect *Cryptosporidium* log removals for the various Bin Classifications.

The commission agrees with this comment regarding the publication error in the *Texas Register*. In response to comment, the commission changed the figure for the following minimum treatment technique requirements: Bin 1 from 22.0-log to 2.0-log; Bin 2 from 44.0-log to 4.0-log; Bin 3 from 55.0-log to 5.0-log; and, Bin 4 from 55.5-log to 5.5-log, as was originally intended by the commission.

AWU stated that the intent of the figure in §290.111(c)(3)(B) was unclear. AWU questioned whether the figure was to stipulate additional removals like the EPA rules are written, or to show the treatment

requirements, including the 3-log credit given to the systems with complete treatment, including AWU. The EPA commented that the figure seems to conflict with the requirements of the table in 40 CFR §141.711 because it contains a minimum treatment technique requirement of 2.0-log for systems in Bin 1 where as the federal rule requires no additional treatment for Bin 1 systems.

The commission responds that the figure in §290.111(c)(3)(B) was designed to consolidate a number of federal requirements, including provisions contained in 40 CFR §§141.170(a)(1), 141.500(a), 141.710(a), and 141.711(a). Therefore, the commission's figure does not match the table in 40 CFR §141.711. The figure in §290.111(c)(3)(B) shows the total treatment requirements, including the additional requirements contained in 40 CFR §141.711(a)(1). The federal table does not explicitly address the removal credits assigned to plants using conventional granular media filters. However, by defining the additional removal requirements the EPA implicitly grants plants using coagulation, flocculation, and granular media filters a 2.5-log *Cryptosporidium* removal credit and plants using coagulation, flocculation, clarification, and granular media filters a 3.0-log *Cryptosporidium* removal credit. To address this issue, the commission included in a footnote, an explicit statement of the *Cryptosporidium* removal credits granted by the EPA in 40 CFR §141.711 to various treatment technologies.

EPA noted the Bin 1 treatment technique requirement in the figure seems to conflict with the removal/inactivation requirement contained in §290.111(c)(3)(D).

The commission responds that systems often use a combination of pathogen removal and pathogen inactivation processes to meet the treatment technique requirement. Although the terms "treatment

technique" and "removal/inactivation" can be used interchangeably, using both within subsection (c) resulted in the misconception that they represent two different requirements. To avoid confusion, the figure has been revised to replace the heading "Minimum Treatment Technique Requirement" with "Minimum Removal/Inactivation Requirement." The commission chose to use the term "removal/inactivation" to be consistent with the terminology in the remainder of this subsection.

EPA commented that §290.111(g)(1) would allow plants meeting enhanced individual filter effluent (IFE) performance criteria an additional 1.0-log *Cryptosporidium* removal credit and §290.111(g)(2) would allow plants meeting enhanced combined filter effluent (CFE) performance criteria an additional 0.5-log *Cryptosporidium* removal credit. Although the state rules prohibit plants from simultaneously claiming both credits, the EPA commented that the approach may not be as stringent as the approach contained in 40 CFR §141.718(a) and (b). The federal provisions grant a plant an additional 0.5-log removal credit for meeting the enhanced IFE performance criteria and a 0.5-log removal credit for meeting the enhanced CFE performance criteria but grant an additional 1.0-log removal credit only if both criteria are met simultaneously.

The commission responds that on page 698 of the January 5, 2006, *Federal Register*, EPA stated "EPA's intent in both the proposal and today's rule is to award an additional 1.0-log *Cryptosporidium* treatment credit to PWSs that meet the criteria for individual filter performance." Although the adopted federal rule differed from the proposal, EPA stated that "EPA has made this modification so that if a PWS fails in an attempt to achieve individual filter performance credit, the PWS is clearly still eligible to receive combined filter performance credit." Because some Texas

systems that are able to meet the enhanced individual filter effluent (IFE) performance criteria may not meet the enhanced combined filter effluent (CFE) performance criteria due to biologically-harmless chemical precipitation, the commission adopts a rule that is consistent with the intent of the current federal rules without requiring that the IFE and CFE performance criteria be met simultaneously. No change has been made in response to this comment.

EPA commented that the proposed §290.111(c)(3)(A) adopts 40 CFR §141.710 by reference. However, the compliance determinations included in §290.111(i) did not include a provision that is analogous to the one contained in 40 CFR §141.710(f).

The commission responds that 40 CFR §141.710(f) provides that failure to report a bin classification is a violation. The commission omitted this specific compliance determination because the executive director will be assigning bin classifications in accordance with the federal requirements. However, to assure that the state rules meet the intent of the federal regulation, the commission added §290.111(i)(6), which provides this violation, and renumbered the subsequent paragraphs in §290.111(i).

§290.112. Total Organic Carbon (TOC).

EPA commented that reduced monitoring requirements for TOC and disinfection by-products were inconsistent with federal regulations of 40 CFR §141.132(b)(1)(iii). The proposed rule did not include the requirement that quarterly TOC samples be collected every 90 days and that monthly TOC samples be collected every 30 days. The commission's regulations do not specify the 30-day and 90-day requirements, but instead are more vague, saying only "monthly" or "quarterly" sampling.

The commission responds that the federal DBP2 rule in 40 CFR §141.132(b)(1)(iii) allows reduced monitoring for systems with low TOC, TTHM, and HAA5 levels. TTHM and HAA5 are disinfection by-products (DBPs). In response to comment, the commission clarified §290.112(c)(2) to show that the term "monthly" explicitly means every 30 days. Similarly, §290.112(c)(2)(A) and (B) were clarified to explicitly state that the requirement for quarterly sampling means every 90 days. Additionally, §290.112(c)(2)(C) was added to contain the new reduced monitoring requirement for systems that have source water TOC less than or equal to 4.0 mg/L, TTHM levels less than 60 micrograms per liter, and HAA5 levels less than 45 micrograms per liter. Related changes for TTHM and HAA5 in §290.113(c)(4) and §290.115 for reduced monitoring reference the changed requirements of §290.112(c)(2) and (3)(B)(iii).

§290.115. Stage 2 Disinfection By-products (TTHM and HAA5).

EPA commented that §290.115(c)(2) was inconsistent with 40 CFR §141.621(a)(2) because the commission's rules contain a "1" at four locations within its table and the federal table contains a "2" in the corresponding locations.

The commission responds that in its table it contains "1" and references a footnote that contains the situations in which a system is required to sample at two sites. Conversely, the federal table contains a "2" in its table and references a footnote that contains the situations in which a system is required to sample at one site. Although these tables appear different because they are stated conversely, the tables are substantively identical. The commission has changed the "1" to a "1 or

2." However, this change does not make the commission's rule more or less stringent than the current federal DBP2 rule. In the table provided in 40 CFR §141.621(a)(2), the federal DBP2 rule requires surface water systems serving fewer than 500 people and surface water systems serving 500 through 3,300 people to identify two sample sites for long-term stage 2 dual sample set collection. Footnote 2 to EPA's table establishes that these systems may collect an individual TTHM sample and an individual HAA5 sample at the location with highest TTHM and HAA5 concentrations, respectively; if the highest TTHM and HAA5 concentations occur at the same locations, the system may collect a dual sample set at that location. For most small systems in Texas the highest TTHM and HAA5 concentrations will occur at a single location. Therefore, it is clearer to say "1 or 2" sample sites under the heading "Routine Number of Sites" rather than "1" or "2" because either condition may apply. In addition, Footnote 3 to the table in §290.115(c)(2) was restated to clarify the conditions under which either one sample or two samples must be collected.

EPA commented that groundwater systems serving 9,999 or fewer people were incorrectly included in the provision that allows systems to choose a single sample site if HAA5 and TTHM levels are highest at the same location. EPA commented that it intends, in a future rulemaking, to make these systems take dual sample sets at two locations.

The commission responds that in the table provided in 40 CFR §141.621(a)(2), the federal DBP2 rule requires groundwater systems serving fewer than 500 people and groundwater systems serving 500 through 9,999 people to identify two sample sites for long-term Stage 2 dual sample set collection. Footnote 2 to EPA's table establishes that these systems may collect an individual TTHM sample and an individual HAA5 sample at the location with highest TTHM and HAA5

concentrations, respectively. If the highest TTHM and HAA5 concentations occur at the same locations the system may collect a dual sample set at that location. The commission responds that it will change the "1" to a "2" for groundwater systems while still referencing the footnote because the commission cannot adopt a rule based on the future intention of the EPA. In table §290.115(c)(3), the footnote will be referenced to remain consistent with the federal DBP2 rule published January 4, 2006.

EPA commented that the state citation does not reference or include the allowance for reduced TOC monitoring for a system that treats surface water or groundwater under the direct influence of surface water, whereas the federal rule makes this allowance.

The commission responds that when it incorporated the federal language into its rules it included the allowance for reduced TOC monitoring. In response to comment, the commission amended its reference in §290.115(c)(3)(B)(iii) from §290.112 to §290.112(c)(2)(C) to direct the regulated community to the proper location of the provision, which is consistent with 40 CFR §141.132(b)(1)(iii) and §141.623(a).

EPA commented that the state must have the authority to require initial distribution system evaluation (IDSE) sampling under any circumstances, even if the system meets requirements for a Very Small System (VSS) waiver. They further commented that the state must have the authority to require IDSE sampling or a system specific study at new systems, or systems with a change that could impact DBP levels.

The commission responds that in 40 CFR §141.600(d)(2) and §141.604(a) of the federal DBP2 rule, any system may be required by the state to perform IDSE sampling or a system specific study under any circumstances, even if that system meets the criteria for a waiver. Under 40 CFR §142.10(b), a state must adopt rules no less stringent than the corresponding federal rules in order to maintain primacy over its public drinking water program. If the commission's rule did not authorize the executive director to require IDSE sampling under any circumstances, then the state rule would not be as stringent as the federal rules contained in 40 CFR §141.600(d)(2) and §141.604(a). In response to comment, the commission added new §290.115(c)(5)(D) to make conforming changes to match the federal rule. For example, new §290.115(c)(5)(D) establishes that the executive director may require IDSE sampling for systems that are new that have a change in activity status, population or water source consistent with 40 CFR §141.600(d)(2).

EPA commented that with regard to §290.115(c)(5)(B), any operational samples, not just compliance samples, may be used to determine whether a system can be granted a "40/30 waiver" to IDSE sampling.

The commission responds that under 40 CFR §142.10(b), a state must adopt rules no less stringent than the corresponding federal rules in order to maintain primacy over its public drinking water program. Under the federal rule if a system has levels over 40 micrograms per liter TTHM and 30 micrograms per liter of HAA5 (40/30) in any type of sample, it will not be granted a IDSE sampling waiver. The state rule only considered compliance samples. The commission did not refer to the term "operational samples" because the term is not defined in the commission's rules. However, the commission has changed §290.115(c)(5)(B) so that it does not limit the type of sample used to determine eligibility for a 40/30 waiver to compliance samples. To be more inclusive, consistent

with 40 CFR §141.603(a), the words "compliance samples" were replaced with the word "levels" in §290.115(c)(5)(B). Additionally, consistent with 40 CFR §141.603(a), the word "compliance" was deleted in §290.115(c)(5)(B)(i).

EPA commented that the IDSE plan must include system type and population.

The commission responds that the federal DBP2 rule, in 40 CFR §141.601(a)(3), requires the IDSE plan to include the system type and population. Under 40 CFR §142.10(b), a state must adopt rules no less stringent than the corresponding federal rules in order to maintain primacy over its public drinking water program. If the commission did not require that the IDSE plan include the system type and population, it would not be as stringent as the federal rule. In response to comment, new §290.115 (c)(5)(C)(i)(III) was added to require that the PWS include the system type and population in its IDSE plan.

EPA commented that in Figure §290.115(c)(5)(C)(ii)(I), Number and Types of IDSE Sample Sites, the number of required sample points for surface water systems with fewer than 500 customers was incorrect.

The commission agrees with this comment and has corrected the typographical error by adding the number "1" under the column headed, "Potential High TTHM Locations", consistent with 40 CFR §141.601(b)(1), in response to comment.

EPA commented that §290.115(g)(3) only required systems to provide IDSE plans to their customers, whereas systems are actually required to provide all IDSE documentation.

The commission responds that in the federal DBP2 rule, 40 CFR §§141.33(f), 141.600(c)(4), and 141.603(b)(4), EPA requires that any IDSE documentation be provided to a system's customers upon request. Under 40 CFR §142.10(b), a state must adopt rules no less stringent than the corresponding federal rules in order to maintain primacy over its public drinking water program. If the commission only requires the systems to provide only the IDSE plans and not the other IDSE documents to their customers, the rule would be less stringent than the requirements in 40 CFR §§141.33(f), 141.600(c)(4), and 141.603(b)(4). In response to comment, the reference to subsection (c)(5)(C) was changed to a reference to subsection (c)(5), thus referencing all documentation related to IDSE activities. This new reference now requires systems to provide all IDSE documentation to its customers upon request.

§290.116. Groundwater Corrective Actions and Treatment Techniques.

AWU commented that §290.116(a)(1) appears to be missing its subsection reference at the end of the first sentence. AWU suggested the sentence should read "…in accordance with subsection (c) of this section."

The commission agrees with this comment and the suggested change has been made.

§290.119. Analytical Procedures.

EPA commented that citations related to analytical methods and laboratory certification in §290.119 were not up to date.

The commission agrees with this comment and has updated its references as follows: in §290.119(b)(2), the commission changed a reference from 40 CFR §141.22(a) to §141.74(a)(1); in §290.119(b)(6), the commission added a reference to 40 CFR §141.131(a) for DBP methods; in §290.119(b)(8), the commission added the words "bromide and magnesium", consistent with 40 CFR §141.131(d)(2); and, in §290.119(c) the commission added a reference to 40 CFR §141.151(d), defining the term "detection."

SUBCHAPTER D: RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS

§§290.38, 290.39, 290.41, 290.42, 290.44, 290.45, 290.46, 290.47

STATUTORY AUTHORITY

These amendments are adopted under Texas Water Code (TWC), §5.102, which establishes the commission's general authority necessary to carry out its jurisdiction; §5.103, which establishes the commission's general authority to adopt rules; §5.105, which establishes the commission's authority to set policy by rule; and Texas Health and Safety Code (THSC), §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 United States Code, §§300f to 300j-26; and THSC, §341.0315, which requires public water systems to comply with commission rules adopted to ensure the supply of safe drinking water.

The adopted amendments implement TWC, §§5.102, 5.103, 5.105, THSC, §341.031, and §341.0315.

§290.38. Definitions.

The following words and terms, when used in this chapter shall have the following meanings, unless the context clearly indicates otherwise. If a word or term used in this chapter is not contained in the following list, its definition shall be as shown in Title 40 Code of Federal Regulations (CFR) §141.2. Other technical terms used shall have the meanings or definitions listed in the latest edition of *The Drinking Water Dictionary,* prepared by the American Water Works Association.

(1) **Air gap--**The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet conveying water to a tank, fixture, receptor, sink, or other

assembly and the flood level rim of the receptacle. The vertical, physical separation must be at least twice the diameter of the water supply outlet, but never less than 1.0 inch.

(2) **ANSI standards**--The standards of the American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018.

(3) **Approved laboratory**--A laboratory certified and approved by the commission to analyze water samples to determine their compliance with maximum allowable constituent levels.

(4) **ASME standards**--The standards of the American Society of Mechanical Engineers, 346 East 47th Street, New York, New York 10017.

(5) **ASTM standards**--The standards of the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19102.

(6) **Auxiliary power**--Either mechanical power or electric generators which can enable the system to provide water under pressure to the distribution system in the event of a local power failure. With the approval of the executive director, dual primary electric service may be considered as auxiliary power in areas which are not subject to large scale power outages due to natural disasters.

(7) **AWWA standards**--The latest edition of the applicable standards as approved and published by the American Water Works Association, 6666 West Quincy Avenue, Denver, Colorado 80235.

(8) **Bag Filter**--Pressure-driven separation device that removes particulate matter larger than 1 micrometer using an engineered porous filtration media. They are typically constructed of a non-rigid, fabric filtration media housed in a pressure vessel in which the direction of flow is from the inside of the bag to the outside.

(9) **Cartridge filter**--Pressure-driven separation device that removes particulate matter larger than 1 micrometer using an engineered porous filtration media. They are typically constructed as rigid or semi-rigid, self-supporting filter elements housed in pressure vessels in which flow is from the outside of the cartridge to the inside.

(10) **Certified laboratory**--A laboratory certified by the commission to analyze water samples to determine their compliance with maximum allowable constituent levels.

(11) **Challenge test**--A study conducted to determine the removal efficiency (log removal value) of a device for a particular organism, particulate, or surrogate.

(12) **Chemical disinfectant** – Any oxidant, including but not limited to chlorine, chlorine dioxide, chloramines, and ozone added to the water in any part of the treatment or distribution process, that is intended to kill or inactivate pathogenic microorganisms.

(13) **Community water system**--A public water system which has a potential to serve at least 15 residential service connections on a year-round basis or serves at least 25 residents on a year-round basis.

(14) **Connection**--A single family residential unit or each commercial or industrial establishment to which drinking water is supplied from the system. As an example, the number of service connections in an apartment complex would be equal to the number of individual apartment units. When enough data is not available to accurately determine the number of connections to be served or being served, the population served divided by three will be used as the number of connections for calculating system capacity requirements. Conversely, if only the number of connections is known, the connection total multiplied by three will be the number used for population served. For the purposes of this definition, a dwelling or business which is connected to a system that delivers water by a constructed conveyance other than a pipe shall not be considered a connection if:

(A) the water is used exclusively for purposes other than those defined as human consumption (see human consumption);

(B) the executive director determines that alternative water to achieve the equivalent level of public health protection provided by the drinking water standards is provided for residential or similar human consumption, including, but not limited to, drinking and cooking; or

(C) the executive director determines that the water provided for residential or similar human consumption is centrally treated or is treated at the point of entry by a provider, a pass

through entity, or the user to achieve the equivalent level of protection provided by the drinking water standards.

(15) **Contamination**--The presence of any foreign substance (organic, inorganic, radiological or biological) in water which tends to degrade its quality so as to constitute a health hazard or impair the usefulness of the water.

(16) **Cross-connection**--A physical connection between a public water system and either another supply of unknown or questionable quality, any source which may contain contaminating or polluting substances, or any source of water treated to a lesser degree in the treatment process.

(17) **Direct integrity test**--A physical test applied to a membrane unit in order to identify and isolate integrity breaches/leaks that could result in contamination of the filtrate.

(18) **Disinfectant--**A chemical or a treatment which is intended to kill or inactivate pathogenic microorganisms in water.

(19) **Disinfection**--A process which inactivates pathogenic organisms in the water by chemical oxidants or equivalent agents.

(20) **Distribution system**--A system of pipes that conveys potable water from a treatment plant to the consumers. The term includes pump stations, ground and elevated storage tanks, potable

water mains, and potable water service lines and all associated valves, fittings, and meters, but excludes potable water customer service lines.

(21) **Drinking water**--All water distributed by any agency or individual, public or private, for the purpose of human consumption or which may be used in the preparation of foods or beverages or for the cleaning of any utensil or article used in the course of preparation or consumption of food or beverages for human beings. The term "Drinking Water" shall also include all water supplied for human consumption or used by any institution catering to the public.

(22) **Drinking water standards**--The commission rules covering drinking water standards in Subchapter F of this chapter (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems).

(23) **Elevated storage capacity**--That portion of water which can be stored at least 80 feet above the highest service connection in the pressure plane served by the storage tank.

(24) **Emergency power**--Either mechanical power or electric generators which can enable the system to provide water under pressure to the distribution system in the event of a local power failure. With the approval of the executive director, dual primary electric service may be considered as emergency power in areas which are not subject to large scale power outages due to natural disasters.

(25) **Filtrate**--The water produced from a filtration process; typically used to describe the water produced by filter processes such as membranes.

(26) **Groundwater**--Any water that is located beneath the surface of the ground and is not under the direct influence of surface water.

(27) **Groundwater under the direct influence of surface water**--Any water beneath the surface of the ground with:

(A) significant occurrence of insects or other macroorganisms, algae, or large-diameter pathogens such as *Giardia lamblia* or *Cryptosporidium;* or

(B) significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions.

(28) **Health hazard**--A cross-connection, potential contamination hazard, or other situation involving any substance that can cause death, illness, spread of disease, or has a high probability of causing such effects if introduced into the potable drinking water supply.

(29) **Human consumption**--Uses by humans in which water can be ingested into or absorbed by the human body. Examples of these uses include, but are not limited to drinking, cooking, brushing teeth, bathing, washing hands, washing dishes, and preparing foods.

(30) **Indirect integrity monitoring**--The monitoring of some aspect of filtrate water quality, such as turbidity, that is indicative of the removal of particulate matter.

(31) **Innovative/alternate treatment**--Any treatment process that does not have specific design requirements in §290.42(a) – (f) of this title (relating to Water Treatment). For example, the adjustment of fluoride ion content, special treatment for metals, iron, manganese, organic and inorganic contaminant reduction, special methods for taste and odor control, demineralization, corrosion control processes, membrane filtration, bag/cartridge filters, ozone, chlorine dioxide, Ultraviolet (UV) light disinfection, and other treatment processes.

(32) **Interconnection**--A physical connection between two public water supply systems.

(33) **International Fire Code (IFC)**--The standards of the International Code Council, 500 New Jersey Avenue, NW, 6th Floor, Washington, DC 20001.

(34) **Intruder-resistant fence**--A fence six feet or greater in height, constructed of wood, concrete, masonry, or metal with three strands of barbed wire extending outward from the top of the fence at a 45 degree angle with the smooth side of the fence on the outside wall. In lieu of the barbed wire, the fence must be eight feet in height. The fence must be in good repair and close enough to surface grade to prevent intruder passage.

(35) **L/d ratio**--The dimensionless value that is obtained by dividing the length (depth) of a granular media filter bed by the weighted effective diameter "d" of the filter media. The weighted

effective diameter of the media is calculated based on the percentage of the total bed depth contributed by each media layer.

(36) **Licensed professional engineer**--An engineer who maintains a current license through the Texas Board of Professional Engineers in accordance with its requirements for professional practice.

(37) **Log removal value (LRV)**--Removal efficiency for a target organism, particulate, or surrogate expressed as $\log_{10}$ (i.e., $\log_{10}$ (feed concentration) – $\log_{10}$ (filtrate concentration).

(38) **Maximum daily demand**--In the absence of verified historical data or in cases where a public water system has imposed mandatory water use restrictions within the past 36 months, maximum daily demand means 2.4 times the average daily demand of the system.

(39) **Maximum contaminant level (MCL)--**The MCL for a specific contaminant is defined in the section relating to that contaminant.

(40) **Membrane filtration**--A pressure or vacuum driven separation process in which particulate matter larger than one micrometer is rejected by an engineered barrier, primarily through a size-exclusion mechanism, and which has a measurable removal efficiency of a target organism that can be verified through the application of a direct integrity test; includes the following common membrane classifications microfiltration (MF), ultrafiltration (UF), nanofiltration (NF), and reverse osmosis (RO), as well as any “membrane cartridge filtration” (MCF) device that satisfies this definition.

(41) **Membrane $LRV_{C\text{-}Test}$**--The number that reflects the removal efficiency of the membrane filtration process demonstrated during challenge testing. The value is based on the entire set of LRVs obtained during challenge testing, with one representative LRV established per module tested.

(42) **Membrane module**--The smallest component of a membrane unit in which a specific membrane surface area is housed in a device with a filtrate outlet structure.

(43) **Membrane sensitivity**--The maximum log removal value (LRV) that can be reliably verified by a direct integrity test.

(44) **Membrane unit**--A group of membrane modules that share common valving, which allows the unit to be isolated from the rest of the system for the purpose of integrity testing or other maintenance.

(45) **Milligrams per liter (mg/L)**--A measure of concentration, equivalent to and replacing parts per million in the case of dilute solutions.

(46) **Monthly reports of water works operations**--The daily record of data relating to the operation of the system facilities compiled in a monthly report.

(47) **National Fire Protection Association (NFPA) standards**--The standards of the NFPA, 1 Batterymarch Park, Quincy, Massachusetts, 02269-9101.

(48) **National Sanitation Foundation (NSF)--**The NSF or reference to the listings developed by the foundation, P.O. Box 1468, Ann Arbor, Michigan 48106.

(49) **Noncommunity water system**--Any public water system which is not a community system.

(50) **Nonhealth hazard--**A cross-connection, potential contamination hazard, or other situation involving any substance that generally will not be a health hazard, but will constitute a nuisance, or be aesthetically objectionable, if introduced into the public water supply.

(51) **Nontransient noncommunity water system**--A public water system that is not a community water system and regularly serves at least 25 of the same persons at least six months out of the year.

(52) **psi--**Pounds per square inch.

(53) **Peak hourly demand--**In the absence of verified historical data, peak hourly demand means 1.25 times the maximum daily demand (prorated to an hourly rate) if a public water supply meets the commission's minimum requirements for elevated storage capacity and 1.85 times the maximum daily demand (prorated to an hourly rate) if the system uses pressure tanks or fails to meet the commission's minimum elevated storage capacity requirement.

(54) **Plumbing inspector**--Any person employed by a political subdivision for the purpose of inspecting plumbing work and installations in connection with health and safety laws and ordinances, who has no financial or advisory interest in any plumbing company, and who has successfully fulfilled the examinations and requirements of the Texas State Board of Plumbing Examiners.

(55) **Plumbing ordinance**--A set of rules governing plumbing practices which is at least as stringent and comprehensive as one of the following nationally recognized codes:

(A) the International Plumbing Code; or

(B) the Uniform Plumbing Code.

(56) **Potable water customer service line**--The sections of potable water pipe between the customer's meter and the customer's point of use.

(57) **Potable water service line**--The section of pipe between the potable water main to the customer's side of the water meter. In cases where no customer water meter exists, it is the section of pipe that is under the ownership and control of the public water system.

(58) **Potable water main**--A pipe or enclosed constructed conveyance operated by a public water system which is used for the transmission or distribution of drinking water to a potable water service line.

(59) **Potential contamination hazard**--A condition which, by its location, piping or configuration, has a reasonable probability of being used incorrectly, through carelessness, ignorance, or negligence, to create or cause to be created a backflow condition by which contamination can be introduced into the water supply. Examples of potential contamination hazards are:

(A) bypass arrangements;

(B) jumper connections;

(C) removable sections or spools; and

(D) swivel or changeover assemblies.

(60) **Process control duties**--Activities that directly affect the potability of public drinking water, including: making decisions regarding the day-to-day operations and maintenance of public water system production and distribution; maintaining system pressures; determining the adequacy of disinfection and disinfection procedures; taking routine microbiological samples; taking chlorine residuals and microbiological samples after repairs or installation of lines or appurtenances; and operating chemical feed systems, filtration, disinfection, or pressure maintenance equipment; or performing other duties approved by the executive director.

(61) **Public drinking water program**--Agency staff designated by the executive director to administer the Safe Drinking Water Act and state statutes related to the regulation of public drinking

water. Any report required to be submitted in this chapter to the executive director must be submitted to the Texas Commission on Environmental Quality, Water Supply Division, MC 155, P.O. Box 13087, Austin, Texas 78711-3087.

(62) **Public health engineering practices**--Requirements in this subchapter or guidelines promulgated by the executive director.

(63) **Public water system**--A system for the provision to the public of water for human consumption through pipes or other constructed conveyances, which includes all uses described under the definition for drinking water. Such a system must have at least 15 service connections or serve at least 25 individuals at least 60 days out of the year. This term includes; any collection, treatment, storage, and distribution facilities under the control of the operator of such system and used primarily in connection with such system, and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Two or more systems with each having a potential to serve less than 15 connections or less than 25 individuals but owned by the same person, firm, or corporation and located on adjacent land will be considered a public water system when the total potential service connections in the combined systems are 15 or greater or if the total number of individuals served by the combined systems total 25 or greater at least 60 days out of the year. Without excluding other meanings of the terms "individual" or "served," an individual shall be deemed to be served by a water system if he lives in, uses as his place of employment, or works in a place to which drinking water is supplied from the system.

(64) **Quality Control Release Value (QCRV)**--A minimum quality standard of a non-destructive performance test (NDPT) established by the manufacturer for membrane module production that ensures that the module will attain the targeted log removal value (LRV) demonstrated during challenge testing.

(65) **Reactor Validation Testing**--A process by which a full-scale UV reactor's disinfection performance is determined relative to operating parameters that can be monitored. These parameters include flow rate, UV intensity as measured by a UV sensor and the UV lamp status.

(66) **Resolution--**The size of the smallest integrity breach that contributes to a response from a direct integrity test in membranes used to treat surface water or groundwater under the direct influence of surface water.

(67) **Sanitary control easement**--A legally binding document securing all land, within 150 feet of a public water supply well location, from pollution hazards. This document must fully describe the location of the well and surrounding lands and must be filed in the county records to be legally binding.

(68) **Sanitary survey**--An onsite review of the water source, facilities, equipment, operation and maintenance of a public water system, for the purpose of evaluating the adequacy for producing and distributing safe drinking water.

(69) **Sensitivity--**The maximum log removal value (LRV) that can be reliably verified by a direct integrity test in membranes used to treat surface water or groundwater under the direct influence of surface water; also applies to some continuous indirect integrity monitoring methods.

(70) **Service line--**A pipe connecting the utility service provider's main and the water meter, or for wastewater, connecting the main and the point at which the customer's service line is connected, generally at the customer's property line.

(71) **Service pump--**Any pump that takes treated water from storage and discharges to the distribution system.

(72) **Transfer pump--**Any pump which conveys water from one point to another within the treatment process or which conveys water to storage facilities prior to distribution.

(73) **Transient noncommunity water system--**A public water system that is not a community water system and serves at least 25 persons at least 60 days out of the year, yet by its characteristics, does not meet the definition of a nontransient noncommunity water system.

(74) **Wastewater lateral--**Any pipe or constructed conveyance carrying wastewater, running laterally down a street, alley, or easement, and receiving flow only from the abutting properties.

(75) **Wastewater main--**Any pipe or constructed conveyance which receives flow from one or more wastewater laterals.

§290.39. General Provisions.

(a) Authority for requirements. Texas Health and Safety Code (THSC), Chapter 341, Subchapter C prescribes the duties of the commission relating to the regulation and control of public drinking water systems in the state. The statute requires that the commission ensure that public water systems: supply safe drinking water in adequate quantities, are financially stable and technically sound, promote use of regional and area-wide drinking water systems, and review completed plans and specifications and business plans for all contemplated public water systems not exempted by THSC, §341.035(d). The statute also requires the commission be notified of any subsequent material changes, improvements, additions, or alterations in existing systems and, consider compliance history in approving new or modified public water systems.

(b) Reason for this subchapter and minimum criteria. This subchapter has been adopted to ensure regionalization and area-wide options are fully considered, the inclusion of all data essential for comprehensive consideration of the contemplated project, or improvements, additions, alterations, or changes thereto and to establish minimum standardized public health design criteria in compliance with existing state statutes and in accordance with good public health engineering practices. In addition, minimum acceptable financial, managerial, technical, and operating practices must be specified to ensure that facilities are properly operated to produce and distribute a safe, potable water.

(c) Required actions and approvals prior to construction. A person may not begin construction of a public drinking water supply system unless the executive director determines the following requirements have been satisfied and approves construction of the proposed system.

(1) A person proposing to install a public drinking water system within the extraterritorial jurisdiction of a municipality; or within 1/2-mile of the corporate boundaries of a district, or other political subdivision providing the same service; or within 1/2-mile of a certificated service area boundary of any other water service provider shall provide to the executive director evidence that:

(A) written application for service was made to that provider; and

(B) all application requirements of the service provider were satisfied, including the payment of related fees.

(2) A person may submit a request for an exception to the requirements of paragraph (1) of this subsection if the application fees will create a hardship on the person. The request must be accompanied by evidence documenting the financial hardship.

(3) A person who is not required to complete the steps in paragraph (1) of this subsection, or who completes the steps in paragraph (1) of this subsection and is denied service or determines that the existing provider's cost estimate is not feasible for the development to be served, shall submit to the executive director:

(A) plans and specifications for the system; and

(B) a business plan for the system.

(d) Submission of plans.

(1) Plans, specifications, and related documents will not be considered unless they have been prepared under the direction of a licensed professional engineer. All engineering documents must have engineering seals, signatures, and dates affixed in accordance with the rules of the Texas Board of Professional Engineers.

(2) Detailed plans must be submitted for examination at least 30 days prior to the time that approval, comments or recommendations are desired. From this, it is not to be inferred that final action will be forthcoming within the time mentioned.

(3) The limits of approval are as follows.

(A) The commission's public drinking water program furnishes consultation services as a reviewing body only, and its licensed professional engineers may neither act as design engineers nor furnish detailed estimates.

(B) The commission's public drinking water program does not examine plans and specifications in regard to the structural features of design, such as strength of concrete or adequacy of reinforcing. Only the features covered by this subchapter will be reviewed.

(C) The consulting engineer and/or owner must provide surveillance adequate to assure that facilities will be constructed according to approved plans and must notify the executive director in writing upon completion of all work. Planning materials shall be submitted to the Texas Commission on Environmental Quality, Water Supply Division, MC 153, P.O. Box 13087, Austin, Texas 78711-3087.

(e) Submission of planning material. In general, the planning material submitted shall conform to the following requirements.

(1) Engineering reports are required for new water systems and all surface water treatment plants. Engineering reports are also required when design or capacity deficiencies are identified in an existing system. The engineering report shall include, at least, coverage of the following items:

(A) statement of the problem or problems;

(B) present and future areas to be served, with population data;

(C) the source, with quantity and quality of water available;

(D) present and estimated future maximum and minimum water quantity demands;

(E) description of proposed site and surroundings for the water works facilities;

(F) type of treatment, equipment, and capacity of facilities;

(G) basic design data, including pumping capacities, water storage and flexibility of system operation under normal and emergency conditions; and

(H) the adequacy of the facilities with regard to delivery capacity and pressure throughout the system.

(2) All plans and drawings submitted may be printed on any of the various papers which give distinct lines. All prints must be clear, legible and assembled to facilitate review.

(A) The relative location of all facilities which are pertinent to the specific project shall be shown.

(B) The location of all abandoned or inactive wells within 1/4-mile of a proposed well site shall be shown or reported.

(C) If staged construction is anticipated, the overall plan shall be presented, even though a portion of the construction may be deferred.

(D) A general map or plan of the municipality, water district, or area to be served shall accompany each proposal for a new water supply system.

(3) Specifications for construction of facilities shall accompany all plans. If a process or equipment which may be subject to probationary acceptance because of limited application or use in Texas is proposed, the executive director may give limited approval. In such a case, the owner must be given a bonded guarantee from the manufacturer covering acceptable performance. The specifications shall include a statement that such a bonded guarantee will be provided to the owner and shall also specify those conditions under which the bond will be forfeited. Such a bond will be transferable. The bond shall be retained by the owner and transferred when a change in ownership occurs.

(4) A copy of each fully executed sanitary control easement and any other documentation demonstrating compliance with §290.41(c)(1)(F) of this title (relating to Water Sources) shall be provided to the executive director prior to placing the well into service. Each original easement document, if obtained, must be recorded in the deed records at the county courthouse. Section 290.47(c) of this title (relating to Appendices) includes a suggested form.

(5) Construction features and siting of all facilities for new water systems and for major improvements to existing water systems must be in conformity with applicable commission rules.

(f) Submission of business plans. The prospective owner of the system or the person responsible for managing and operating the system must submit a business plan to the executive director that demonstrates that the owner or operator of the system has available the financial, managerial, and technical capability to ensure future operation of the system in accordance with applicable laws and rules. The executive director may order the prospective owner or operator to demonstrate financial assurance to operate the system in accordance with applicable laws and rules as specified in Chapter 37, Subchapter O of this title (relating to Financial Assurance for Public Drinking Water Systems and Utilities), or as specified by commission rule, unless the executive director finds that the business plan demonstrates adequate financial capability. A business plan shall include the information and be presented in a format prescribed by the executive director. For community water systems, the business plan shall contain, at a minimum, the following elements:

(1) description of areas and population to be served by the potential system;

(2) description of drinking water supply systems within a two-mile radius of the proposed system, copies of written requests seeking to obtain service from each of those drinking water supply systems, and copies of the responses to the written requests;

(3) time line for construction of the system and commencement of operations;

(4) identification of and costs of alternative sources of supply;

(5) selection of the alternative to be used and the basis for that selection;

(6) identification of the person or entity which owns or will own the drinking water system and any identifiable future owners of the drinking water system;

(7) identification of any other businesses and public drinking water system(s) owned or operated by the applicant, owner(s), parent organization, and affiliated organization(s);

(8) an operations and maintenance plan which includes sufficient detail to support the budget estimate for operation and maintenance of the facilities;

(9) assurances that the commitments and resources needed for proper operation and maintenance of the system are, and will continue to be, available, including the qualifications of the organization and each individual associated with the proposed system;

(10) for retail public utilities as defined by Texas Water Code (TWC), §13.002:

(A) projected rate revenue from residential, commercial, and industrial customers; and

(B) pro forma income, expense, and cash flow statements;

(11) identification of any appropriate financial assurance, including those being offered to capital providers;

(12) a notarized statement signed by the owner or responsible person that the business plan has been prepared under his direction and that he is responsible for the accuracy of the information; and

(13) other information required by the executive director to determine the adequacy of the business plan or financial assurance.

(g) Business plans not required. A person is not required to file a business plan if the person:

(1) is a county;

(2) is a retail public utility as defined by TWC, §13.002, unless that person is a utility as defined by that section;

(3) has executed an agreement with a political subdivision to transfer the ownership and operation of the water supply system to the political subdivision; or

(4) is a noncommunity nontransient water system and the person has demonstrated financial assurance under THSC, Chapter 361 or 382 or TWC, Chapter 26.

(h) Beginning and completion of work.

(1) No person may begin construction on a new public water system before receiving written approval of plans and specifications and, if required, approval of a business plan from the executive director. No person may begin construction of modifications to a public water system without providing notification to the executive director and submitting and receiving approval of plans and specifications if requested in accordance with subsection (j) of this section.

(2) The executive director shall be notified in writing by the design engineer or the owner before construction is started.

(3) Upon completion of the water works project, the engineer or owner shall notify the executive director in writing as to its completion and attest to the fact that the completed work is substantially in accordance with the plans and change orders on file with the commission.

(i) Changes in plans and specifications. Any addenda or change orders which may involve a health hazard or relocation of facilities, such as wells, treatment units, and storage tanks, shall be submitted to the executive director for review and approval.

(j) Changes in existing systems or supplies. Public water systems shall notify the executive director prior to making any significant change or addition to the system's production, treatment, storage, pressure maintenance, or distribution facilities. Public water systems shall submit plans and specifications for the proposed changes upon request. Changes to an existing disinfection process at a treatment plant that treats surface water or groundwater that is under the direct influence of surface water shall not be instituted without the prior approval of the executive director.

(1) The following changes are considered to be significant:

(A) proposed changes to existing systems which result in an increase or decrease in production, treatment, storage, or pressure maintenance capacity;

(B) proposed changes to the disinfection process used at plants that treat surface water or groundwater that is under the direct influence of surface water including changes involving the disinfectants used, the disinfectant application points, or the disinfectant monitoring points;

(C) proposed changes to the type of disinfectant used to maintain a disinfectant residual in the distribution system;

(D) proposed changes in existing distribution systems when the change is greater than 10% of the existing distribution capacity or 250 connections, whichever is smaller, or results in the water system's inability to comply with any of the applicable capacity requirements of §290.45 of this title (relating to Minimum Water System Capacity Requirements);

(E) proposed replacement or change of membranes modules; and

(F) any other material changes specified by the executive director.

(2) The executive director shall determine whether engineering plans and specifications will be required after reviewing the initial notification regarding the nature and extent of the modifications.

(A) Upon request of the executive director, the water system shall submit plans and specifications in accordance with the requirements of subsection (d) of this section.

(B) Unless plans and specifications are required by Chapter 293 of this title (relating to Water Districts), the executive director will not require another state agency or a political subdivision to submit planning material on distribution line improvements if the entity has its own internal review staff and complies with all of the following criteria:

(i) the internal review staff includes one or more licensed professional engineers that are employed by the political subdivision and must be separate from, and not subject to the review or supervision of, the engineering staff or firm charged with the design of the distribution extension under review;

(ii) a licensed professional engineer on the internal review staff determines and certifies in writing that the proposed distribution system changes comply with the requirements of §290.44 of this title (relating to Water Distribution) and will not result in a violation of any provision of §290.45 of this title;

(iii) the state agency or political subdivision includes a copy of the written certification described in this subparagraph with the initial notice that is submitted to the executive director.

(C) Unless plans and specifications are required by Chapter 293 of this title, the executive director will not require planning material on distribution line improvements from any public water system that is required to submit planning material to another state agency or political subdivision that complies with the requirements of subparagraph (B) of this paragraph. The notice to the executive director must include a statement that a state statute or local ordinance requires the planning materials to be submitted to the other state agency or political subdivision and a copy of the written certification that is required in subparagraph (B) of this paragraph.

(3) If a certificate of convenience and necessity (CCN) is required or must be amended, the CCN application must be included with the notice to the executive director.

(k) Planning material acceptance. Planning material for improvements to an existing system which does not meet the requirements of all sections of this subchapter will not be considered unless the necessary modifications for correcting the deficiencies are included in the proposed improvements, or unless the executive director determines that reasonable progress is being made toward correcting the deficiencies and no immediate health hazard will be caused by the delay.

(l) Exceptions. Requests for exceptions to one or more of the requirements in this subchapter shall be considered on an individual basis. Any water system which requests an exception must demonstrate to

the satisfaction of the executive director that the exception will not compromise the public health or result in a degradation of service or water quality.

(1) The exception must be requested in writing and must be substantiated by carefully documented data. The request for an exception shall precede the submission of engineering plans and specifications for a proposed project for which an exception is being requested.

(2) Any exception granted by the commission is subject to revocation.

(3) Any request for an exception which is not approved by the commission in writing is denied.

(4) The executive director may establish site specific design, operation, maintenance, and reporting requirements for systems that have been issued an exception to the subchapter.

(m) Notification of system startup or reactivation. The owner or responsible official must provide written notification to the commission of the startup of a new public water supply system or reactivation of an existing public water supply system. This notification must be made immediately upon meeting the definition of a public water system as defined in §290.38 of this title (relating to Definitions).

(n) The commission may require the owner or operator of a public drinking water supply system that was constructed without the approval required by THSC, §341.035, that has a history of

noncompliance with THSC, Chapter 341, Subchapter C or commission rules, or that is subject to a commission enforcement action to take the following action:

(1) provide the executive director with a business plan that demonstrates that the system has available the financial, managerial, and technical resources adequate to ensure future operation of the system in accordance with applicable laws and rules. The business plan must fulfill all the requirements for a business plan as set forth in subsection (f) of this section;

(2) provide adequate financial assurance of the ability to operate the system in accordance with applicable laws and rules. The executive director will set the amount of the financial assurance, after the business plan has been reviewed and approved by the executive director.

(A) The amount of the financial assurance will equal the difference between the amount of projected system revenues and the projected cash needs for the period of time prescribed by the executive director.

(B) The form of the financial assurance will be as specified in Chapter 37, Subchapter O of this title and will be as specified by the executive director.

(C) If the executive director relies on rate increases or customer surcharges as the form of financial assurance, such funds shall be deposited in an escrow account as specified in Chapter 37, Subchapter O of this title and released only with the approval of the executive director.

§290.41. Water Sources.

(a) Water quality. The quality of water to be supplied must meet the quality criteria prescribed by the commission's drinking water standards contained in Subchapter F of this chapter (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems).

(b) Water quantity. Sources of supply, both ground and surface, shall have a safe yield capable of supplying the maximum daily demands of the distribution system during extended periods of peak usage and critical hydrologic conditions. The pipelines and pumping capacities to treatment plants or distribution systems shall be adequate for such water delivery. Minimum capacities required are specified in §290.45 of this title (relating to Minimum Water System Capacity Requirements).

(c) Groundwater sources and development.

(1) Groundwater sources shall be located so that there will be no danger of pollution from flooding or from unsanitary surroundings, such as privies, sewage, sewage treatment plants, livestock and animal pens, solid waste disposal sites or underground petroleum and chemical storage tanks and liquid transmission pipelines, or abandoned and improperly sealed wells.

(A) No well site which is within 50 feet of a tile or concrete sanitary sewer, sewerage appurtenance, septic tank, storm sewer, or cemetery; or which is within 150 feet of a septic tank perforated drainfield, areas irrigated by low dosage, low angle spray on-site sewage facilities, absorption

bed, evapotranspiration bed, improperly constructed water well, or underground petroleum and chemical storage tank or liquid transmission pipeline will be acceptable for use as a public drinking water supply. Sanitary or storm sewers constructed of ductile iron or polyvinyl chloride (PVC) pipe meeting American Water Works Association (AWWA) standards, having a minimum working pressure of 150 pounds per square inch (psi) or greater, and equipped with pressure type joints may be located at distances of less than 50 feet from a proposed well site, but in no case shall the distance be less than ten feet.

(B) No well site shall be located within 500 feet of a sewage treatment plant or within 300 feet of a sewage wet well, sewage pumping station, or a drainage ditch which contains industrial waste discharges or the wastes from sewage treatment systems.

(C) No water wells shall be located within 500 feet of animal feed lots, solid waste disposal sites, lands on which sewage plant or septic tank sludge is applied, or lands irrigated by sewage plant effluent.

(D) Livestock in pastures shall not be allowed within 50 feet of water supply wells.

(E) All known abandoned or inoperative wells (unused wells that have not been plugged) within 1/4-mile of a proposed well site shall be reported to the commission along with existing or potential pollution hazards. These reports are required for community and nontransient, noncommunity groundwater sources. Examples of existing or potential pollution hazards which may affect groundwater quality include, but are not limited to: landfill and dump sites, animal feedlots, military facilities,

industrial facilities, wood-treatment facilities, liquid petroleum and petrochemical production, storage, and transmission facilities, Class 1, 2, 3, and 4 injection wells, and pesticide storage and mixing facilities. This information must be submitted prior to construction or as required by the executive director.

(F) A sanitary control easement or sanitary control easements covering land within 150 feet of the well, or executive director approval for a substitute authorized by this subsection, shall be obtained.

(i) The sanitary control easement(s) secured shall provide that none of the pollution hazards covered in subparagraphs (A) - (E) of this paragraph, or any facilities that might create a danger of pollution to the water to be produced from the well, will be located thereon.

(ii) For the purpose of a sanitary control easement, an improperly constructed water well is one which fails to meet the surface and subsurface construction standards for public water supply wells. Residential type wells within a sanitary control easement must be constructed to public water well standards.

(iii) A copy of the recorded sanitary control easement(s) shall be included with plans and specifications submitted to the executive director for review.

(iv) With the approval of the executive director, the public water system may submit any of the following as a substitute for obtaining, recording, and submitting a copy of the recorded sanitary control easement(s) covering land within 150 feet of the well:

(I) a copy of the recorded deed and map demonstrating that the public water system owns all real property within 150 feet of the well;

(II) a copy of the recorded deed and map demonstrating that the public water system owns a portion of real property within 150 feet of the well, and a copy of the sanitary control easement(s) that the public water system has obtained, recorded, and submitted to the executive director applicable to the remaining portion of real property within 150 feet of the well not owned by the public water system; or

(III) for a political subdivision, a copy of an ordinance or land use restriction adopted and enforced by the political subdivision which provides an equivalent or higher level of sanitary protection to the well as a sanitary control easement.

(v) If the executive director approves a sanitary control easement substitute identified in clause (iv)(I) or (iv)(II) of this subparagraph for a public water system and the public water system conveys the property it owns within 150 feet of the well to another person or persons, the public water system must at that time obtain, record, and submit to the executive director a copy of the recorded sanitary control easement(s) applicable to the conveyed portion of the property within 150 feet of the well, unless the executive director approves a substitute identified in clause (iv) of this subparagraph.

(2) The premises, materials, tools, and drilling equipment shall be maintained so as to minimize contamination of the groundwater during drilling operation.

(A) Water used in any drilling operation shall be of safe sanitary quality. Water used in the mixing of drilling fluids or mud shall contain a chlorine residual of at least 0.5 milligrams per liter (mg/L).

(B) The slush pit shall be constructed and maintained so as to minimize contamination of the drilling mud.

(C) No temporary toilet facilities shall be maintained within 150 feet of the well being constructed unless they are of a sealed, leakproof type.

(3) The construction, disinfection, protection, and testing of a well to be used as a public water supply source must meet the following conditions.

(A) Before placing the well into service, a public water system shall furnish a copy of the well completion data, which includes the following items: the Driller's Log (geological log and material setting report); a cementing certificate; the results of a 36-hour pump test; the results of the microbiological and chemical analyses required by subparagraphs (F) and (G) of this paragraph; a legible copy of the recorded deed or deeds for all real property within 150 feet of the well; a legible copy of the sanitary control easement(s) or other documentation demonstrating compliance with paragraph (1)(F) of this subsection; an original or legible copy of a United States Geological Survey 7.5-minute topographic

quadrangle showing the accurate well location to the executive director; and a map demonstrating the well location in relation to surrounding property boundaries. All the documents listed in this paragraph must be approved by the executive director before final approval is granted for the use of the well.

(B) The casing material used in the construction of wells for public use shall be new carbon steel, high-strength low-alloy steel, stainless steel or plastic. The material shall conform to AWWA standards. The casing shall extend a minimum of 18 inches above the elevation of the finished floor of the pump room or natural ground surface and a minimum of one inch above the sealing block or pump motor foundation block when provided. The casing shall extend at least to the depth of the shallowest water formation to be developed and deeper, if necessary, in order to eliminate all undesirable water-bearing strata. Well construction materials containing more than 8.0% lead are prohibited.

(C) The space between the casing and drill hole shall be sealed by using enough cement under pressure to completely fill and seal the annular space between the casing and the drill hole. The well casing shall be cemented in this manner from the top of the shallowest formation to be developed to the earth's surface. The driller shall utilize a pressure cementation method in accordance with the AWWA Standard for Water Wells (A100-06), Appendix C: Section C.2 (Positive Displacement Exterior Method); Section C.3 (Interior Method Without Plug); Section C.4 (Positive Placement, Interior Method, Drillable Plug); and Section C.5 (Placement Through Float Shoe Attached to Bottom of Casing). Cementation methods other than those listed in this subparagraph may be used on a site-specific basis with the prior written approval of the executive director. A cement bonding log, as well as any other documentation deemed necessary, may be required by the executive director to assure complete sealing of the annular space.

(D) When a gravel packed well is constructed, all gravel shall be of selected and graded quality and shall be thoroughly disinfected with a 50 mg/L chlorine solution as it is added to the well cavity.

(E) Safeguards shall be taken to prevent possible contamination of the water or damage by trespassers following the completion of the well and prior to installation of permanent pumping equipment.

(F) Upon well completion, or after an existing well has been reworked, the well shall be disinfected in accordance with current AWWA standards for well disinfection except that the disinfectant shall remain in the well for at least six hours.

(i) Before placing the well in service, the water containing the disinfectant shall be flushed from the well and then samples of water shall be collected and submitted for microbiological analysis until three successive daily raw water samples are free of coliform organisms. The analysis of these samples must be conducted by a laboratory approved by the Department of State Health Services.

(ii) Appropriate facilities for treatment of the water shall be provided where a satisfactory microbiological record cannot be established after repeated disinfection. The extent of water treatment required will be determined on the basis of geological data, well construction features, nearby sources of contamination and, perhaps, on the basis of quantitative microbiological analyses.

(G) A complete physical and chemical analysis of the water produced from a new well shall be made after 36 hours of continuous pumping at the design withdrawal rate. Shorter pump test periods can be accepted for large capacity wells producing from areas of known groundwater production and quality so as to prevent wasting of water. Samples must be submitted to a certified laboratory for chemical analyses. Tentative approval may be given on the basis of tests performed by in-plant or private laboratories, but final acceptance by the commission shall be on the basis of results from the certified laboratory. Appropriate treatment shall be provided if the analyses reveal that the water from the well fails to meet the water quality criteria as prescribed by the drinking water standards. These criteria include turbidity, color and threshold odor limitations, and excessive hydrogen sulfide, carbon dioxide, or other constituents or minerals which make the water undesirable or unsuited for domestic use. Additional chemical and microbiological tests may be required after the executive director conducts a vulnerability assessment of the well.

(H) Below ground-level pump rooms and pump pits will not be allowed in connection with water supply installations.

(I) The well site shall be fine graded so that the site is free from depressions, reverse grades, or areas too rough for proper ground maintenance so as to ensure that surface water will drain away from the well. In all cases, arrangements shall be made to convey well pump drainage, packing gland leakage, and floor drainage away from the wellhead. Suitable drain pipes located at the outer edge of the concrete floor shall be provided to collect this water and prevent its ponding or collecting around the wellhead. This wastewater shall be disposed of in a manner that will not cause any

nuisance from mosquito breeding or stagnation. Drains shall not be directly connected to storm or sanitary sewers.

(J) In all cases, a concrete sealing block extending at least three feet from the well casing in all directions, with a minimum thickness of six inches and sloped to drain away at not less than 0.25 inches per foot shall be provided around the wellhead.

(K) Wellheads and pump bases shall be sealed by a gasket or sealing compound and properly vented to prevent the possibility of contaminating the well water. A well casing vent shall be provided with an opening that is covered with 16-mesh or finer corrosion-resistant screen, facing downward, elevated and located so as to minimize the drawing of contaminants into the well. Wellheads and well vents shall be at least two feet above the highest known watermark or 100-year flood elevation, if available, or adequately protected from possible flood damage by levees.

(L) If a well blow-off line is provided, its discharge shall terminate in a downward direction and at a point which will not be submerged by flood waters.

(M) A suitable sampling cock shall be provided on the discharge pipe of each well pump prior to any treatment.

(N) Flow measuring devices shall be provided for each well to measure production yields and provide for the accumulation of water production data. These devices shall be located to facilitate daily reading.

(O) All completed well units shall be protected by intruder-resistant fences, the gates of which are provided with locks or shall be enclosed in locked, ventilated well houses to exclude possible contamination or damage to the facilities by trespassers. The gates or wellhouses shall be locked during periods of darkness and when the plant is unattended.

(P) An all-weather access road shall be provided to each well site.

(Q) If an air release device is provided on the discharge piping, it shall be installed in such a manner as to preclude the possibility of submergence or possible entrance of contaminants. In this respect, all openings to the atmosphere shall be covered with 16-mesh or finer, corrosion-resistant screening material or an acceptable equivalent.

(4) Pitless units may be desirable in areas subject to vandalism or extended periods of subfreezing weather.

(A) Pitless units shall be shop fabricated from the point of connection with the well casing to the unit cap or cover, be threaded or welded to the well casing, be of watertight construction throughout, and be of materials and weight at least equivalent and compatible to the casing. The units must have a field connection to the lateral discharge from the pitless unit of threaded, flanged, or mechanical joint connection.

(B) The design of the pitless unit shall make provisions for an access to disinfect the well, a properly designed casing vent, a cover at the upper terminal of the well that will prevent the entrance of contamination, a sealed entrance connection for electrical cable, and at least one check valve within the well casing. The unit shall have an inside diameter as great as that of the well casing up to and including casing diameters of 12 inches.

(C) If the connection to the casing is by field weld, the shop-assembled unit must be designed specifically for field welding to the casing. The only field welding permitted will be that needed to connect a pitless unit to the well casing.

(D) With the exception of the fact that the well was constructed using a pitless unit, the well must otherwise meet all of the requirements of paragraph (3) of this subsection.

(d) Springs and other water sources.

(1) Springs and other similar sources of flowing artesian water shall be protected from potential contaminant sources in accordance with the requirements of subsection (c)(1) of this section.

(2) Before placing the spring or similar source into service, completion data similar to that required by subsection (c)(3)(A) of this section must be submitted to the executive director for review and approval to the Texas Commission on Environmental Quality, Water Supply Division, MC 153, P.O. Box 13087, Austin, Texas 78711-3087.

(3) Springs and similar sources shall be constructed in a manner which will preclude the entrance of surface water and debris.

(A) The site shall be fine graded so that it is free from depressions, reverse grades, or areas too rough for proper ground maintenance in order to ensure that surface water will drain away from the source.

(B) The spring or similar source shall be encased in an open-bottomed, watertight basin which intercepts the flowing water below the surface of the ground. The basin shall extend at least 18 inches above ground level. The top of the basin shall also be at least two feet above the highest known watermark or 100-year flood elevation, if available, or adequately protected from possible flood damage by levees.

(C) In all cases, a concrete sealing block shall be provided which extends at least three feet from the encasement in all directions. The sealing block shall be at least six inches thick and be sloped to drain away from the encasement at not less than 0.25 inches per foot.

(D) The top of the encasement shall be provided with a sloped, watertight roof which prevents the ponding of water and precludes the entrance of animals, insects, and other sources of contamination.

(E) The roof of the encasement shall be provided with a hatch that is not less than 30 inches in diameter. The hatch shall have a raised curbing at least four inches in height with a lockable

cover that overlaps the curbing at least two inches in a downward direction. Where necessary, a gasket shall be used to make a positive seal when the hatch is closed. All hatches shall remain locked except during inspections and maintenance.

(F) The encasement shall be provided with a gooseneck vent or roof ventilator which is equipped with approved screens to prevent entry of animals, birds, insects, and heavy air contaminants. Screens shall be fabricated of corrosion-resistant material and shall be 16-mesh or finer. Screens shall be securely clamped in place with stainless or galvanized bands or wires.

(G) The encasement shall be provided with an overflow which is designed to prevent the entry of animals, birds, insects, and debris. The discharge opening of the overflow shall be above the surface of the ground and shall not be subject to submergence.

(4) Springs and similar sources must be provided with the appurtenances required by subsection (c)(3)(L) - (Q) of this section.

(5) All systems with new springs or similar sources must monitor microbiological source water quality at the new springs or similar sources in accordance with §290.111 of this title (relating to Surface Water Treatment) on a schedule determined by the executive director. The system must notify the agency of the new spring or similar source prior to construction. The executive director may waive these requirements if the spring or similar source has been determined not to be under the direct influence of surface water.

(e) Surface water sources and development.

(1) To determine the degree of pollution from all sources within the watershed, an evaluation shall be made of the surface water source in the area of diversion and its tributary streams. The area where surface water sources are diverted for drinking water use shall be evaluated and protected from sources of contamination.

(A) Where surface water sources are subject to continuous or intermittent contamination by municipal, agricultural, or industrial wastes and/or treated effluent, the adverse effects of the contamination on the quality of the raw water reaching the treatment plant shall be determined by site evaluations and laboratory procedures.

(B) The disposal of all liquid or solid wastes from any source on the watershed must be in conformity with applicable regulations and state statutes.

(C) Shore installations, marinas, boats and all habitations on the watershed shall be provided with satisfactory sewage disposal facilities. Septic tanks and soil absorption fields, tile or concrete sanitary sewers, sewer manholes, or other approved toilet facilities shall not be located in an area within 75 feet horizontally from the lake water surface at the uncontrolled spillway elevation of the lake or 75 feet horizontally from the 50-year flood elevation, whichever is lower.

(D) Disposal of wastes from boats or any other watercraft shall be in accordance with the Texas Water Code, §§321.1 - 321.18.

(E) Pesticides or herbicides which are used within the watershed shall be applied in strict accordance with the product label restrictions.

(F) Before approval of a new surface water source, the system shall provide the executive director with information regarding specific water quality parameters of the potential source water. These parameters are pH, total coliform, *Escherichia coli*, turbidity, alkalinity, hardness, bromide, total organic carbon, temperature, color, taste and odor, regulated volatile organic compounds, regulated synthetic organic compounds, regulated inorganic compounds, and possible sources of contamination. If data on the incidence of *Giardia* cysts and *Cryptosporidium* oocysts has been collected, the information shall be provided to the executive director. This data shall be provided to the executive director as part of the approval process for a new surface water source.

(G) All systems with new surface water intakes or new bank filtration wells must monitor microbiological source water quality at the new surface water intakes or new bank filtration wells in accordance with §290.111 of this title on a schedule determined by the executive director. The system must notify the agency of the new surface water intake or bank filtration well prior to construction.

(2) Intakes shall be located and constructed in a manner which will secure raw water of the best quality available from the source.

(A) Intakes shall not be located in areas subject to excessive siltation or in areas subject to receiving immediate runoff from wooded sloughs or swamps.

(B) Raw water intakes shall not be located within 1,000 feet of boat launching ramps, marinas, docks, or floating fishing piers which are accessible by the public.

(C) A restricted zone of 200 feet radius from the raw water intake works shall be established and all recreational activities and trespassing shall be prohibited in this area. Regulations governing this zone shall be in the city ordinances or the rules and regulations promulgated by a water district or similar regulatory agency. The restricted zone shall be designated with signs recounting these restrictions. The signs shall be maintained in plain view of the public and shall be visible from all parts of the restricted area. In addition, special buoys may be required as deemed necessary by the executive director. Provisions shall be made for the strict enforcement of such ordinances or regulations.

(D) Commission staff shall make an on-site evaluation of any proposed raw water intake location. The evaluation must be requested prior to final design and must be supported by preliminary design drawings. Once the final intake location has been selected, the executive director shall be furnished with an original or legible copy of a United States Geological Survey 7.5-minute topographic quadrangle showing the accurate intake location.

(E) Intakes shall be located and constructed in a manner which will allow raw water to be taken from a variety of depths and which will permit withdrawal of water when reservoir levels are very low. Fixed level intakes are acceptable if water quality data is available to establish that the effect on raw water quality will be minimal.

(F) Water intake works shall be provided with screens or grates to minimize the amount of debris entering the plant.

(G) Intakes shall not be located within 500 feet of a sewage treatment plant or lands irrigated with sewage effluent.

(3) The raw water pump station shall be located in a well-drained area and shall be designed to remain in operation during flood events.

(4) An all weather road shall be provided to the raw water pump station.

(5) The raw water pump station and all appurtenances must be installed in a lockable building that is designed to prevent intruder access or enclosed by an intruder-resistant fence with lockable gates.

§290.42. Water Treatment.

(a) Capacity and location.

(1) Based on current acceptable design standards, the total capacity of the public water system's treatment facilities must always be greater than its anticipated maximum daily demand.

(2) The water treatment plant and all pumping units shall be located in well-drained areas not subject to flooding and away from seepage areas or where the groundwater water table is near the surface.

(A) Water treatment plants shall not be located within 500 feet of a sewage treatment plant or lands irrigated with sewage effluent. A minimum distance of 150 feet must be maintained between any septic tank drainfield line and any underground treatment or storage unit. Any sanitary sewers located within 50 feet of any underground treatment or storage unit shall be constructed of ductile iron or polyvinyl chloride (PVC) pipe with a minimum pressure rating of 150 pounds per square inch (psi) and have watertight joints.

(B) Plant site selection shall also take into consideration the need for disposition of all plant wastes in accordance with all applicable regulations and state statutes, including both liquid and solid waste or by-product material from operation and/or maintenance.

(3) Each water treatment plant shall be located at a site that is accessible by an all-weather road.

(b) Groundwater.

(1) Disinfection facilities shall be provided for all groundwater supplies for the purpose of microbiological control and distribution protection and shall be in conformity with applicable disinfection requirements in subsection (e) of this section.

(2) Treatment facilities shall be provided for groundwater if the water does not meet the drinking water standards. The facilities provided shall be in conformance with established and proven methods.

(A) Filters provided for turbidity and microbiological quality control shall be preceded by coagulant addition and shall conform to the requirements of subsection (d)(11) of this section. Filtration rates for iron and manganese removal, regardless of the media or type of filter, shall be based on a maximum rate of five gallons per square foot per minute.

(B) The removal of iron and manganese may not be required if it can be demonstrated that these metals can be sequestered so that the discoloration problems they cause do not exist in the distribution system.

(C) All processes involving exposure of the water to atmospheric contamination shall provide for subsequent disinfection of the water ahead of ground storage tanks. Likewise, all exposure of water to atmospheric contamination shall be accomplished in a manner such that insects, birds, and other foreign materials will be excluded from the water. Aerators and all other such openings shall be screened with 16-mesh or finer corrosion-resistant screen.

(3) Any proposed change in the extent of water treatment required will be determined on the basis of geological data, well construction features, nearby sources of contamination, and on qualitative and quantitative microbiological and chemical analyses.

(4) Appropriate laboratory facilities shall be provided for controls as well as to check the effectiveness of disinfection or any other treatment processes employed.

(5) All plant piping shall be constructed to minimize leakage.

(6) All groundwater systems shall provide sampling taps for raw water, treated water, and at a point representing water entering the distribution system at every entry point.

(7) Air release devices shall be installed in such a manner as to preclude the possibility of submergence or possible entrance of contaminants. In this respect, all openings to the atmosphere shall be covered with 16-mesh or finer corrosion-resistant screening material or an equivalent acceptable to the executive director.

(8) The executive director may require 4-log removal or inactivation of viruses based on raw water sampling results required by §290.116 of this title (relating to Groundwater Corrective Actions and Treatment Techniques).

(c) Springs and other water sources.

(1) Water obtained from springs, infiltration galleries, wells in fissured areas, wells in carbonate rock formations, or wells that do not penetrate an impermeable strata or any other source subject to surface or near surface contamination of recent origin shall be evaluated for the provision of

treatment facilities. Minimum treatment shall consist of coagulation with direct filtration and adequate disinfection. In all cases, the treatment process shall be designed to achieve at least a 2-log removal of *Cryptosporidium* oocysts, a 3-log removal or inactivation of *Giardia* cysts, and a 4-log removal or inactivation of viruses before the water is supplied to any consumer. The executive director may require additional levels of treatment in cases of poor source water quality. Based on raw water monitoring results, the executive director may require additional levels of treatment for *Cryptosporidium* treatment as specified in §290.111 of this title (relating to Surface Water Treatment).

(A) Filters provided for turbidity and microbiological quality control shall conform to the requirements of subsection (d)(11) of this section.

(B) All processes involving exposure of the water to atmospheric contamination shall provide for subsequent disinfection of the water ahead of ground storage tanks. Likewise, all exposure of water to atmospheric contamination shall be accomplished in a manner such that insects, birds, and other foreign materials will be excluded from the water. Aerators and all other such openings shall be screened with 16-mesh or finer corrosion-resistant screen.

(2) Any proposed change in the extent of water treatment required will be determined on the basis of geological data, well construction features, nearby sources of contamination, and qualitative and quantitative microbiological and chemical analyses.

(3) Appropriate laboratory facilities shall be provided for controls as well as for checking the effectiveness of disinfection or any other treatment processes employed.

(4) All plant piping shall be constructed to minimize leakage. No cross-connection or interconnection shall be permitted to exist between a conduit carrying potable water and another conduit carrying raw water or water in a prior stage of treatment.

(5) All systems using springs and other water sources shall provide sampling taps for raw water, treated water, and at a point representing water entering the distribution system at every entry point.

(6) Return of the decanted water or sludge to the treatment process shall be adequately controlled so that there will be a minimum of interference with the treatment process and shall conform to the applicable requirements of subsection (d)(3) of this section. Systems that do not comply with the provisions of subsection (d)(3) of this section commit a treatment technique violation and must notify their customers in accordance with the requirements of §290.122(b) of this title (relating to Public Notice).

(7) Air release devices on treated waterlines shall be installed in such a manner as to preclude the possibility of submergence or possible entrance of contaminants. In this respect, all openings to the atmosphere shall be covered with 16-mesh or finer corrosion-resistant screening material or an equivalent acceptable to the executive director.

(d) Surface water.

(1) All water secured from surface sources shall be given complete treatment at a plant which provides facilities for pretreatment disinfection, taste and odor control, continuous coagulation, sedimentation, filtration, covered clearwell storage, and terminal disinfection of the water with chlorine or suitable chlorine compounds. In all cases, the treatment process shall be designed to achieve at least a 2-log removal of *Cryptosporidium* oocysts, a 3-log removal or inactivation of *Giardia* cysts, and a 4-log removal or inactivation of viruses before the water is supplied to any consumer. The executive director may require additional levels of treatment in cases of poor source water quality. Based on raw water monitoring results, the executive director may require additional levels of treatment for *Cryptosporidium* treatment as specified in §290.111 of this title.

(2) All plant piping shall be constructed so as to be thoroughly tight against leakage. No cross-connection or interconnection shall be permitted to exist in a filtration plant between a conduit carrying filtered or post-chlorinated water and another conduit carrying raw water or water in any prior stage of treatment.

(A) Vacuum breakers must be provided on each hose bibb within the plant facility.

(B) No conduit or basin containing raw water or any water in a prior stage of treatment shall be located directly above, or be permitted to have a single common partition wall with another conduit or basin containing finished water.

(C) Make-up water supply lines to chemical feeder solution mixing chambers shall be provided with an air gap or other acceptable backflow prevention device.

(D) Filters shall be located so that common walls will not exist between them and aerators, mixing and sedimentation basins or clearwells. This rule is not strictly applicable, however, to partitions open to view and readily accessible for inspection and repair.

(E) Filter-to-waste connections, if included, shall be provided with an air gap connection to waste.

(F) Air release devices on treated waterlines shall be installed in such a manner as to preclude the possibility of submergence or possible entrance of contaminants. In this respect, all openings to the atmosphere shall be covered with 16-mesh or finer corrosion-resistant screening material or an equivalent acceptable to the executive director.

(3) Return of the decanted water or solids to the treatment process shall be adequately controlled so that there will be a minimum of interference with the treatment process. Systems that do not comply with the provisions of this paragraph commit a treatment technique violation and must notify their customers in accordance with the requirements of §290.122(b) of this title (relating to Public Notice).

(A) Unless the executive director has approved an alternate recycling location, spent backwash water and the liquids from sludge settling lagoons, spent backwash water tanks, sludge thickeners, and similar dewatering facilities shall be returned to the raw waterline upstream of the raw

water sample tap and coagulant feed point. The blended recycled liquids shall pass through all of the major unit processes at the plant.

(B) Recycle facilities shall be designed to minimize the magnitude and impact of hydraulic surges that occur during the recycling process.

(C) Solids produced by dewatering facilities such as sludge lagoons, sludge thickeners, centrifuges, mechanical presses, and similar devices shall not be returned to the treatment plant without the prior approval of the executive director.

(4) Reservoirs for pretreatment or selective quality control shall be provided where complete treatment facilities fail to operate satisfactorily at times of maximum turbidities or other abnormal raw water quality conditions exist. Recreational activities at such reservoirs shall be prohibited.

(5) Flow measuring devices shall be provided to measure the raw water supplied to the plant, the recycled decant water, the treated water used to backwash the filters, and the treated water discharged from the plant. Additional metering devices shall be provided as appropriate to monitor the flow rate through specific treatment processes. Metering devices shall be located to facilitate use and to assist in the determination of chemical dosages, the accumulation of water production data, and the operation of plant facilities.

(6) Chemical storage facilities shall comply with applicable requirements in subsection (f)(1) of this section.

(7) Chemical feed facilities shall comply with the applicable requirements in subsection (f)(2) of this section.

(8) Flash mixing equipment shall be provided.

(A) Plants with a design capacity greater than 3.0 million gallons per day must provide at least one hydraulic mixing unit or at least two sets of mechanical flash mixing equipment designed to operate in parallel. Public water systems with other surface water treatment plants, interconnections with other systems, or wells that can meet the system's average daily demand are exempt from the requirement for redundant mechanical flash mixing equipment.

(B) Flash mixing equipment shall have sufficient flexibility to ensure adequate dispersion and mixing of coagulants and other chemicals under varying raw water characteristics and raw water flow rates.

(9) Flocculation equipment shall be provided.

(A) Plants with a design capacity greater than 3.0 million gallons per day must provide at least two sets of flocculation equipment which are designed to operate in parallel. Public water systems with other surface water treatment plants, interconnections with other systems, or wells that can meet the system's average daily demand are exempt from the requirement for redundant flocculation equipment.

(B) Flocculation facilities shall be designed to provide adequate time and mixing intensity to produce a settleable floc under varying raw water characteristics and raw water flow rates.

(i) Flocculation facilities for straight-flow and up-flow sedimentation basins shall provide a minimum theoretical detention time of at least 20 minutes when operated at their design capacity. Flocculation facilities constructed prior to October 1, 2000 are exempt from this requirement if the settled water turbidity of each sedimentation basin remains below 10.0 nephelometric turbidity unit (NTU) and the treatment plant meets with turbidity requirements of §290.111 of this title (relating to Surface Water Treatment).

(ii) The mixing intensity in multiple-stage flocculators shall decrease as the coagulated water passes from one stage to the next.

(C) Coagulated water or water from flocculators shall flow to sedimentation basins in such a manner as to prevent destruction of floc. Piping, flumes, and troughs shall be designed to provide a flow velocity of 0.5 to 1.5 feet per second. Gates, ports, and valves shall be designed at a maximum flow velocity of 4.0 feet per second in the transfer of water between units.

(10) Clarification facilities shall be provided.

(A) Plants with a design capacity greater than 3.0 million gallons per day must provide at least two sedimentation basins or clarification units which are designed to operate in parallel.

Public water systems with other surface water treatment plants, interconnections with other systems, or wells that can meet the system's average daily demand are exempt from the requirement for redundant sedimentation basins or clarification units.

(B) The inlet and outlet of clarification facilities shall be designed to prevent short-circuiting of flow or the destruction of floc.

(C) Clarification facilities shall be designed to remove flocculated particles effectively.

(i) When operated at their design capacity, basins for straight-flow or up-flow sedimentation of coagulated waters shall provide either a theoretical detention time of at least six hours in the flocculation and sedimentation chambers or a maximum surface overflow rate of 0.6 gallons per minute per square foot of surface area in the sedimentation chamber.

(ii) When operated at their design capacity, basins for straight-flow or up-flow sedimentation of softened waters shall provide either a theoretical detention time of at least 4.5 hours in the flocculation and sedimentation chambers or a maximum surface overflow rate of 1.0 gallons per minute per square foot of surface area in the sedimentation chamber.

(iii) When operated at their design capacity, sludge-blanket and solids-recirculation clarifiers shall provide either a theoretical detention time of at least two hours in the

flocculation and sedimentation chambers or a maximum surface overflow rate of 1.0 gallons per minute per square foot in the settling chamber.

(iv) A side wall water depth of at least 12 feet shall be provided in clarification basins that are not equipped with mechanical sludge removal facilities.

(v) The effective length of a straight-flow sedimentation basin shall be at least twice its effective width.

(D) Clarification facilities shall be designed to prevent the accumulation of settled solids.

(i) At treatment plants with a single clarification basin, facilities shall be provided to drain the basin within six hours. In the event that the plant site topography is such that gravity draining cannot be realized, a permanently installed electric-powered pump station shall be provided to dewater the basin. Public water systems with other potable water sources that can meet the system's average daily demand are exempt from this requirement.

(ii) Facilities for sludge removal shall be provided by mechanical means or by hopper-bottomed basins with valves capable of complete draining of the units.

(11) Gravity or pressure type filters shall be provided.

(A) The use of pressure filters shall be limited to installations with a treatment capacity of less than 0.50 million gallons per day.

(B) Filtration facilities shall be designed to operate at filtration rates which assure effective filtration at all times.

(i) The design capacity of gravity rapid sand filters shall not exceed a maximum filtration rate of 2.0 gallons per square foot per minute. At the beginning of filter runs for declining rate filters, a maximum filtration rate of 3.0 gallons per square foot per minute is allowed.

(ii) Where high-rate gravity filters are used, the design capacity shall not exceed a maximum filtration rate of 5.0 gallons per square foot per minute. At the beginning of filter runs for declining rate filters, a maximum filtration rate of 6.5 gallons per square foot per minute is allowed.

(iii) The design capacity of pressure filters shall not exceed a maximum filtration rate of 2.0 gallons per square foot per minute with the largest filter off-line.

(iv) Except as provided in clause (vi) of this subparagraph, any surface water treatment plant that provides, or is being designed to provide, less than 7.5 million gallons per day must be able to meet either the maximum daily demand or the minimum required 0.6 gallons per minute per connection, whichever is larger, with all filters on-line.

(v) Any surface water treatment plant that provides, or is being designed to provide, 7.5 million gallons per day or more must be able to meet either the maximum daily demand or the minimum required 0.6 gallons per minute per connection, whichever is larger, with the largest filter off-line.

(vi) Any surface water treatment plant that uses pressure filters must be able to meet either the maximum daily demand or the minimum required 0.6 gallons per minute per connection, whichever is larger, with the largest filter off-line.

(C) The depth and condition of the media and support material shall be sufficient to provide effective filtration.

(i) The filtering material shall conform to American Water Works Association (AWWA) standards and be free from clay, dirt, organic matter, and other impurities.

(ii) The grain size distribution of the filtering material shall be as prescribed by AWWA standards.

(iii) The depth of filter sand, anthracite, granular activated carbon, or other filtering materials shall be 24 inches or greater and provide an L/d ratio of at least 1,000.

(I) Rapid sand filters typically contain a minimum of eight inches of fine sand with an effective size of 0.35 to 0.45 millimeter (mm), eight inches of medium sand

with an effective size of 0.45 to 0.55 mm, and eight inches of coarse sand with an effective size of 0.55 to 0.65 mm. The uniformity coefficient of each size range should not exceed 1.6.

(II) High-rate dual media filters typically contain a minimum of 12 inches of sand with an effective size of 0.45 to 0.55 mm and 24 inches of anthracite with an effective size of 0.9 to 1.1 mm. The uniformity coefficient of each material should not exceed 1.6.

(III) High-rate multi-media filters typically contain a minimum of three inches of garnet media with an effective size of 0.2 to 0.3 mm, nine inches of sand with an effective size of 0.5 to 0.6 mm, and 24 inches of anthracite with an effective size of 0.9 to 1.1 mm. The uniformity coefficient of each size range should not exceed 1.6.

(IV) High-rate mono-media anthracite or granular activated carbon filters typically contain a minimum of 48 inches of anthracite or granular activated carbon with an effective size of 1.0 to 1.2 mm. The uniformity coefficient of each size range should not exceed 1.6.

(iv) Under the filtering material, at least 12 inches of support gravel shall be placed varying in size from 1/16 inch to 2.5 inches. The gravel may be arranged in three to five layers such that each layer contains material about twice the size of the material above it. Other support material may be approved on an individual basis.

(D) The filter shall be provided with facilities to regulate the filtration rate.

(i) With the exception of declining rate filters, each filter unit shall be equipped with a manually adjustable rate-of-flow controller with rate-of-flow indication or flow control valves with indicators.

(ii) Each declining rate filter shall be equipped with a rate-of-flow limiting device or an adjustable flow control valve with a rate-of-flow indicator.

(iii) The effluent line of each filter installed after January 1, 1996, must be equipped with a slow opening valve or another means of automatically preventing flow surges when the filter begins operation.

(E) The filters shall be provided with facilities to monitor the performance of the filter. Monitoring devices shall be designed to provide the ability to measure and record turbidity as required by §290.111 of this title.

(i) Each filter shall be equipped with a sampling tap so that the effluent turbidity of the filter can be individually monitored.

(ii) Each filter operated by a public water system that serves fewer than 10,000 people shall be equipped with an on-line turbidimeter and recorder which will allow the operator to measure and record the turbidity at 15-minute intervals. The executive director may allow combined filter effluent monitoring in lieu of individual filter effluent monitoring under the following conditions:

(I) The public water system has only two filters that were installed prior to October 1, 2000 and were never equipped with individual on-line turbidimeters and recorders; and

(II) The plant is equipped with an on-line turbidimeter and recorder which will allow the operator to measure and record the turbidity level of the combined filter effluent at a location prior to clearwell storage at 15-minute intervals.

(iii) Each filter operated by a public water system that serves at least 10,000 people shall be equipped with an on-line turbidimeter and recorder which will allow the operator to measure and record the turbidity at 15-minute intervals.

(iv) Each filter installed after October 1, 2000 shall be equipped with an on-line turbidimeter and recorder which will allow the operator to determine the turbidity at 15-minute intervals.

(v) Each filter unit that is not equipped with an on-line turbidimeter and recorder shall be equipped with a device to indicate loss of head through the filter. In lieu of loss-of-head indicators, declining rate filter units may be equipped with rate-of-flow indicators.

(F) Filters shall be designed to ensure adequate cleaning during the backwash cycle.

(i) Only filtered water shall be used to backwash the filters. This water may be supplied by elevated wash water tanks, by the effluent of other filters, or by pumps which take suction from the clearwell and are provided for backwashing filters only. For installations having a treatment capacity no greater than 150,000 gallons per day, water for backwashing may be secured directly from the distribution system if proper controls and rate-of-flow limiters are provided.

(ii) The rate of filter backwashing shall be regulated by a rate-of-flow controller or flow control valve.

(iii) The rate of flow of backwash water shall not be less than 20 inches vertical rise per minute (12.5 gallons per minute per square foot) and usually not more than 35 inches vertical rise per minute (21.8 gallons per minute per square foot).

(iv) The backwash facilities shall be capable of expanding the filtering bed during the backwash cycle.

(I) For facilities equipped with air scour, the backwash facilities shall be capable of expanding the filtering bed at least 15% during the backwash cycle.

(II) For mixed-media filters without air scour, the backwash facilities shall be capable of expanding the filtering bed at least 25% during the backwash cycle.

(III) For mono-media sand filters without air scour, the backwash facilities shall be capable of expanding the filtering bed at least 40% during the backwash cycle.

(v) The filter freeboard in inches shall exceed the wash rate in inches of vertical rise per minute.

(vi) When used, surface filter wash systems shall be installed with an atmospheric vacuum breaker or a reduced pressure principle backflow assembly in the supply line. If an atmospheric vacuum breaker is used it shall be installed in a section of the supply line through which all the water passes and which is located above the overflow level of the filter.

(vii) Gravity filters installed after January 1, 1996 shall be equipped with air scour backwash or surface wash facilities.

(G) Each filter installed after October 1, 2000 shall be equipped with facilities that allow the filter to be completely drained without removing other filters from service.

(12) Pipe galleries shall provide ample working room, good lighting, and good drainage provided by sloping floors, gutters, and sumps. Adequate ventilation to prevent condensation and to provide humidity control is also required.

(13) The identification of influent, effluent, waste backwash, and chemical feed lines shall be accomplished by the use of labels or various colors of paint. Where labels are used, they shall be placed along the pipe at no greater than five-foot intervals. Color coding must be by solid color or banding. If bands are used, they shall be placed along the pipe at no greater than five-foot intervals.

(A) A plant that is built or repainted after October 1, 2000 must use the following color code. The color code to be used in labeling pipes is as follows:

Figure: 30 TAC §290.42(d)(13)(A)

LETTERS	COLOR OF PIPE
Potable Water	Light Blue
Compressed Air	Light Green
Instrument Air	Light Green with Dark Green Bands
Chlorine (gas, liquid, or vent)	Yellow
Chlorine (solution)	Yellow with Red Bands
Liquid Alum	Yellow with Orange Bands
Alum (solution)	Yellow with Green Bands
Ammonia	Yellow with Brown Bands
Chlorine Dioxide (solution)	Yellow with Blue Bands
Ferric chloride	Brown with Red Bands
Ferric sulfate	Brown with Yellow Bands
Polymers	White with Green Bands
Liquid caustic	White with Red Bands
Caustic (solution)	White with Orange Bands
Fluoride	White with Yellow Bands
Ozone	Stainless Steel with White Bands
Settled Water	Green
Filter Effluent	Light Blue
Backwash Supply	Light Blue
Backwash Waste	Dark Grey
Drain	Dark Grey
Raw Water	Tan

(B) A plant that was repainted before October 1, 2000 may use an alternate color code. The alternate color code must provide clear visual distinction between process streams.

(C) The system must maintain clear, current documentation of its color code in a location easily accessed by all personnel.

(14) All surface water treatment plants shall provide sampling taps for raw, settled, individual filter effluent, and clearwell discharge. Additional sampling taps shall be provided as appropriate to monitor specific treatment processes.

(15) An adequately equipped laboratory shall be available locally so that daily microbiological and chemical tests can be conducted.

(A) For plants serving 25,000 persons or more, the local laboratory used to conduct the required daily microbiological analyses must be certified by the executive director to conduct coliform analyses.

(B) For plants serving populations of less than 25,000, the facilities for making microbiological tests may be omitted if the required microbiological samples can be submitted to a laboratory certified by the executive director on a timely basis.

(C) All surface water treatment plants shall be provided with equipment for making at least the following determinations:

(i) pH;

(ii) temperature;

(iii) disinfectant residual;

(iv) alkalinity;

(v) turbidity;

(vi) jar tests for determining the optimum coagulant dose; and

(vii) other tests deemed necessary to monitor specific water quality problems or to evaluate specific water treatment processes.

(D) An amperometric titrator with platinum-platinum electrodes shall be provided at all surface water treatment plants that use chlorine dioxide.

(E) Each surface water treatment plant that uses sludge-blanket clarifiers shall be equipped with facilities to monitor the depth of the sludge blanket.

(F) Each surface water treatment plant that uses solids-recirculation clarifiers shall be equipped with facilities to monitor the solids concentration in the slurry.

(16) Each surface water treatment plant shall be provided with a computer and software for recording performance data, maintaining records, and submitting reports to the executive director. The executive director may allow a water system to locate the computer at a site other than the water treatment plant only if performance data can be reliably transmitted to the remote location on a real-time basis, the plant operator has access to the computer at all times, and performance data is readily accessible to agency staff during routine and special investigations.

(e) Disinfection.

(1) All water obtained from surface sources or groundwater sources that are under the direct influence of surface water must be disinfected in a manner consistent with the requirements of §290.110 of this title (relating to Disinfectant Residuals).

(2) All groundwater must be disinfected prior to distribution. The point of application must be ahead of the water storage tank(s) if storage is provided prior to distribution. Permission to use alternate disinfectant application points must be obtained in writing from the executive director.

(3) Disinfection equipment shall be selected and installed so that continuous and effective disinfection can be secured under all conditions.

(A) Disinfection equipment shall have a capacity at least 50% greater than the highest expected dosage to be applied at any time. It shall be capable of satisfactory operation under every prevailing hydraulic condition.

(B) Automatic proportioning of the disinfectant dosage to the flow rate of the water being treated shall be provided at plants where the treatment rate varies automatically and at all plants where the treatment rate varies more than 50% above or below the average flow. Manual control shall be permissible at surface water treatment plants or plants treating groundwater under the direct influence of surface water only if an operator is always on hand to make adjustments promptly.

(C) All disinfecting equipment in surface water treatment plants shall include at least one functional standby unit of each capacity for ensuring uninterrupted operation. Common standby units are permissible but, generally, more than one standby unit must be provided because of the differences in feed rates or the physical state in which the disinfectants are being fed (solid, liquid, or gas).

(D) Facilities shall be provided for determining the amount of disinfectant used daily as well as the amount of disinfectant remaining for use.

(E) When used, solutions of calcium hypochlorite shall be prepared in a separate mixing tank and allowed to settle so that only a clear supernatant liquid is transferred to the hypochlorinator container.

(F) Provisions shall be made for both pretreatment disinfection and post-disinfection in all surface water treatment plants. Additional application points shall be installed if they are required to adequately control the quality of the treated water.

(G) The use of disinfectants other than chlorine will be considered on a case-by-case basis under the exception guidelines of §290.39(l) of this title (relating to General Provisions).

(4) Systems that use chlorine gas must ensure that the risks associated with its use are limited as follows.

(A) When chlorine gas is used, a full-face self-contained breathing apparatus or supplied air respirator that meets Occupational Safety and Health Administration (OSHA) standards for construction and operation, and a small bottle of fresh ammonia solution (or approved equal) for testing for chlorine leakage shall be readily accessible outside the chlorinator room and immediately available to the operator in the event of an emergency.

(B) Housing for gas chlorination equipment and cylinders of chlorine shall be in separate buildings or separate rooms with impervious walls or partitions separating all mechanical and electrical equipment from the chlorine facilities. Housing shall be located above ground level as a measure of safety. Equipment and cylinders may be installed on the outside of the buildings when protected from adverse weather conditions and vandalism.

(C) Adequate ventilation, which includes both high level and floor level screened vents, shall be provided for all enclosures in which gas chlorine is being stored or fed. Enclosures containing more than one operating 150-pound cylinder of chlorine shall also provide forced air ventilation which includes: screened and louvered floor level and high level vents; a fan which is located at and draws air in through the top vent and discharges to the outside atmosphere through the floor level vent; and a fan switch located outside the enclosure. Alternately, systems may install negative pressure ventilation as long as the facilities also have gas containment and treatment as prescribed by the current International Fire Code (IFC) .

(5) Hypochlorination solution containers and pumps must be housed in a secure enclosure to protect them from adverse weather conditions and vandalism. The solution container top must be completely covered to prevent the entrance of dust, insects, and other contaminants.

(6) Where anhydrous ammonia feed equipment is utilized, it must be housed in a separate enclosure equipped with both high and low level ventilation to the outside atmosphere. The enclosure must be provided with forced air ventilation which includes: screened and louvered floor level and high level vents; a fan which is located at and draws air in through the floor vent and discharges through the top vent; and a fan switch located outside the enclosure. Alternately, systems may install negative pressure ventilation as long as the facilities also have gas containment and treatment as prescribed by the current IFC .

(f) Surface water treatment plant chemical storage and feed facilities.

(1) Chemical storage facilities shall be designed to ensure a reliable supply of chemicals to the feeders, minimize the possibility and impact of accidental spills, and facilitate good housekeeping.

(A) Bulk storage facilities at the plant shall be adequate to store at least a 15-day supply of all chemicals needed to comply with minimum treatment technique and maximum contaminant level (MCL) requirements. The capacity of these bulk storage facilities shall be based on the design capacity of the treatment plant. However, the executive director may require a larger stock of chemicals based on local resupply ability.

(B) Day tanks shall be provided to minimize the possibility of severely overfeeding liquid chemicals. Day tanks will not be required if adequate process control instrumentation and procedures are employed to prevent chemical overfeed incidents.

(C) Every chemical bulk storage facility and day tank shall have a label that identifies the facility's or tank's contents and a device that indicates the amount of chemical remaining in the facility or tank.

(D) Dry chemicals shall be stored off the floor in a dry room that is located above ground and protected against flooding or wetting from floors, walls, and ceilings.

(E) Bulk storage facilities and day tanks must be designed to minimize the possibility of leaks and spills.

(i) The materials used to construct bulk storage and day tanks must be compatible with the chemicals being stored and resistant to corrosion.

(ii) Except as provided in this clause, adequate containment facilities shall be provided for all liquid chemical storage tanks.

(I) Containment facilities for a single container or for multiple interconnected containers must be large enough to hold the maximum amount of chemical that can be stored with a minimum freeboard of six vertical inches or to hold 110% of the total volume of the container(s), whichever is less.

(II) Common containment for multiple containers that are not interconnected must be large enough to hold the volume of the largest container with a minimum freeboard of six vertical inches or to hold 110% of the total volume of the container(s), whichever is less.

(III) The materials used to construct containment structures must be compatible with the chemicals stored in the tanks.

(IV) Incompatible chemicals shall not be stored within the same containment structure.

(V) No containment facilities are required for hypochlorite solution containers that have a capacity of 35 gallons or less.

(VI) On a site-specific basis, the executive director may approve the use of double-walled tanks in lieu of separate containment facilities.

(F) Chemical transfer pumps and control systems must be designed to minimize the possibility of leaks and spills.

(G) Piping, pumps, and valves used for chemical storage and transfer must be compatible with the chemical being fed.

(2) Chemical feed and metering facilities shall be designed so that chemicals shall be applied in a manner which will maximize reliability, facilitate maintenance, and ensure optimal finished water quality.

(A) Each chemical feeder that is needed to comply with a treatment technique or MCL requirement shall have a standby or reserve unit. Common standby feeders are permissible, but generally, more than one standby feeder must be provided due to the incompatibility of chemicals or the state in which they are being fed (solid, liquid, or gas).

(B) Chemical feed equipment shall be sized to provide proper dosage under all operating conditions.

(i) Devices designed for determining the chemical feed rate shall be provided for all chemical feeders.

(ii) The capacity of the chemical feeders shall be such that accurate control of the dosage can be achieved at the full range of feed rates expected to occur at the facility.

(iii) Chemical feeders shall be provided with tanks for chemical dissolution when applicable.

(C) Chemical feeders, valves, and piping must be compatible with the chemical being fed.

(D) Chemical feed systems shall be designed to minimize the possibility of leaks and spills and provide protection against backpressure and siphoning.

(E) If enclosed feed lines are used, they shall be designed and installed so as to prevent clogging and be easily maintained.

(F) Dry chemical feeders shall be located in a separate room that is provided with facilities for dust control.

(G) Coagulant feed systems shall be designed so that coagulants are applied to the water prior to or within the mixing basins or chambers so as to permit their complete mixing with the water.

(i) Coagulant feed points shall be located downstream of the raw water sampling tap.

(ii) Coagulants shall be applied continuously during treatment plant operation.

(H) Chlorine feed units, ammonia feed units, and storage facilities shall be separated by solid, sealed walls.

(I) Chemical application points shall be provided to achieve acceptable finished water quality, adequate taste and odor control, corrosion control, and disinfection.

(g) Other treatment processes. Innovative/alternate treatment processes will be considered on an individual basis, in accordance with §290.39(l) of this title. Where innovative/alternate treatment systems are proposed, the licensed professional engineer must provide pilot test data or data collected at similar full-scale operations demonstrating that the system will produce water that meets the requirements of Subchapter F of this chapter (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems). Pilot test data must be representative of the actual operating conditions which can be expected over the course of the year. The executive director may

require a pilot study protocol to be submitted for review and approval prior to conducting a pilot study to verify compliance with the requirements of §290.39(l) of this title and Subchapter F of this chapter (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems). The executive director may require proof of a one-year manufacturer's performance warrantee or guarantee assuring that the plant will produce treated water which meets minimum state and federal standards for drinking water quality.

(1) Package-type treatment systems and their components shall be subject to all applicable design criteria in this section.

(2) Bag and cartridge filtration systems or modules installed or replaced after April 1, 2012, and used for microbiological treatment, can receive *Cryptosporidium* and *Giardia* removal credit of up to 2.0-log for individual bag or cartridge filters and up to 2.5-log for bag or cartridge filters operated in series by meeting the criteria in subparagraphs (A) - (C) of this paragraph.

(A) The filter system must treat the entire plant flow.

(B) To be eligible for this credit, systems must receive approval from the executive director based on the results of challenge testing that is conducted according to the criteria established by 40 CFR §141.719 (a) and the executive director.

(i) A factor of safety equal to 1.0-log for individual bag or cartridge filters and 0.5-log for bag or cartridge filters in series must be applied to challenge testing results to determine removal credit.

(ii) Challenge testing must be performed on full-scale bag or cartridge filters, and the associated filter housing or pressure vessel, that are identical in material and construction to the filters and housings the system will use for removal of *Cryptosporidium* and *Giardia.*

(iii) Bag or cartridge filters must be challenge tested in the same configuration that the system will use, either as individual filters or as a series configuration of filters.

(iv) Systems may use results from challenge testing conducted prior to January 5, 2006, if prior testing was consistent with 40 CFR §141.719, submitted by the system's licensed professional engineer, and approved by the executive director.

(v) If a previously tested filter is modified in a manner that could change the removal efficiency of the filter product line, additional challenge testing to demonstrate the removal efficiency of the modified filter must be conducted and results submitted to the executive director for approval.

(C) Pilot studies must be conducted using filters that will meet the requirements of this section.

(3) Membrane filtration systems or modules installed or replaced after April 1, 2012 and used for microbiological treatment, can receive *Cryptosporidium* and *Giardia* removal credit for membrane filtration if the systems or modules meet the criteria in subparagraphs (A) - (F) of this paragraph.

(A) The membrane module used by the system must undergo challenge testing to evaluate removal efficiency. Challenge testing must be conducted according to the criteria established by 40 CFR §141.719(b)(2) and the executive director.

(i) All membrane module challenge test protocols and results, the protocol for calculating the representative Log Removal Value (LRV) for each membrane module, the removal efficiency, calculated results of $LRV_{C\text{-}Test}$, and the non-destructive performance test with its Quality Control Release Value (QCRV) must be submitted to the executive director for review and approval prior to beginning a membrane filtration pilot study at a public water system.

(ii) Challenge testing must be conducted on either a full-scale membrane module identical in material and construction to the membrane modules to be used in the system's treatment facility, or a smaller-scale membrane module identical in material and similar in construction to the full-scale module if approved by the executive director.

(iii) Systems may use data from challenge testing conducted prior to January 5, 2006, if prior testing was consistent with 40 CFR §141.719, submitted by the system’s licensed professional engineer, and approved by the executive director.

(iv) If a previously tested membrane is modified in a manner that could change the removal efficiency of the membrane product line or the applicability of the non-destructive performance test and associated QCRV, additional challenge testing to demonstrate the removal efficiency of the modified membrane and determine a new QCRV for the modified membrane must be conducted and results submitted to the executive director for approval.

(B) The membrane system must be designed to conduct and record the results of direct integrity testing in a manner that demonstrates a removal efficiency equal to or greater than the removal credit awarded to the membrane filtration system approved by the executive director and meets the requirements in clauses (i) – (ii) of this subparagraph.

(i) The design must provide for direct integrity testing of each membrane unit.

(ii) The design must provide direct integrity testing that has a resolution of 3 micrometers or less.

(iii) The design must provide direct integrity testing with a sensitivity sufficient to verify the log removal credit approved by the executive director. Sensitivity is determined by the criteria in 40 CFR §141.719(b)(3)(iii).

(iv)The executive director may reduce the direct integrity testing requirements for membrane units.

(C) The membrane system must be designed to conduct and record continuous indirect integrity monitoring on each membrane unit. The turbidity of the water produced by each membrane unit must be measured using the Hach FilterTrak Method 10133. The executive director may approve the use of alternative technology to monitor the quality of the water produced by each membrane unit.

(D) The level of removal credit approved by the executive director shall not exceed the lower of:

(i) the removal efficiency demonstrated during challenge testing conducted under the conditions in §290.42(g)(3)(A) of this title, or

(ii) the maximum removal efficiency that can be verified through direct integrity testing used with the membrane filtration process under the conditions in §290.42(g)(3)(B) of this title.

(E) Pilot studies must be conducted using membrane modules that will meet the requirements of this section.

(F) Membrane systems must be designed so that membrane units' feed water, filtrate, backwash supply, waste and chemical cleaning piping shall have cross-connection protection to prevent chemicals from all chemical cleaning processes from contaminating other membrane units in other modes of operation. This may be accomplished by the installation of a double block and bleed valving arrangement, a removable spool system or other alternative methods approved by the executive director.

(4) Bag, cartridge or membrane filtration systems or modules installed or replaced before April 1, 2012 and used for microbiological treatment, can receive up to a 2.0-log removal credit for *Cryptosporidium* and up to a 3.0-log removal credit for *Giardia* based on site specific pilot study results, design, operation, and reporting requirements.

(5) Ultraviolet (UV) light reactors used for microbiological inactivation can receive *Cryptosporidium, Giardia* and virus inactivation credit if the reactors meet the criteria in subparagraphs (A) - (C) of this paragraph.

(A) UV light reactors can receive inactivation credit only if they are located after filtration.

(B) In lieu of a pilot study, the UV light reactors must undergo validation testing to determine the operating conditions under which a UV reactor delivers the required UV dose. Validation testing must be conducted according to the criteria established by 40 CFR §141.720(d)(2) and the executive director.

(i) The validation study must include the following factors: UV absorbance of the water; lamp fouling and aging; measurement uncertainty of on-line sensors; UV dose distributions arising from the velocity profiles through the reactor; failure of UV lamps and other critical system components; inlet and outlet piping or channel configuration of the UV reactor; lamp and sensor locations; and other parameters determined by the executive director.

(ii) Validation testing must be conducted on a full-scale reactor that is essentially identical to the UV reactor(s) to be used by the system and using waters that are essentially identical in quality to the water to be treated by the UV reactor.

(C) The UV light reactor systems must be designed to monitor and record parameters to verify the UV reactors operation within the validated conditions approved by the executive director. The UV light reactor must be equipped with facilities to monitor and record UV intensity as measured by a UV sensor, flow rate, lamp status, and other parameters designated by the executive director.

(h) Sanitary facilities for water works installations. Toilet and hand washing facilities provided in accordance with established standards of good public health engineering practices shall be available at all installations requiring frequent visits by operating personnel.

(i) Permits for waste discharges. Any discharge of wastewater and other plant wastes shall be in accordance with all applicable state and federal statutes and regulations. Permits for discharging wastes from water treatment processes shall be obtained from the commission, if necessary.

(j) Treatment chemicals and media. All chemicals and any additional or replacement process media used in treatment of water supplied by public water systems must conform to American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 60 for direct additives and ANSI/NSF Standard 61 for indirect additives. Conformance with these standards must be obtained by certification of the product by an organization accredited by ANSI.

(k) Safety.

(1) Safety equipment for all chemicals used in water treatment shall meet applicable standards established by the OSHA or Texas Hazard Communication Act, Texas Health and Safety Code, Title 6, Chapter 502.

(2) Systems must comply with United States Environmental Protection Agency (EPA) requirements for Risk Management Plans.

(l) Plant operations manual. A thorough plant operations manual must be compiled and kept up-to-date for operator review and reference. This manual should be of sufficient detail to provide the operator with routine maintenance and repair procedures, with protocols to be utilized in the event of a

natural or man-made catastrophe, as well as provide telephone numbers of water system personnel, system officials, and local/state/federal agencies to be contacted in the event of an emergency.

(m) Security. Each water treatment plant and all appurtenances thereof shall be enclosed by an intruder-resistant fence. The gates shall be locked during periods of darkness and when the plant is unattended. A locked building in the fence line may satisfy this requirement or serve as a gate.

§290.44. Water Distribution.

(a) Design and standards. All potable water distribution systems including pump stations, mains, and both ground and elevated storage tanks, shall be designed, installed, and constructed in accordance with current American Water Works Association (AWWA) standards with reference to materials to be used and construction procedures to be followed. In the absence of AWWA standards, commission review may be based upon the standards of the American Society for Testing and Materials (ASTM), commercial, and other recognized standards utilized by licensed professional engineers.

(1) All newly installed pipes and related products must conform to American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 61 and must be certified by an organization accredited by ANSI.

(2) All plastic pipe for use in public water systems must also bear the National Sanitation Foundation Seal of Approval (NSF-pw) and have an ASTM design pressure rating of at least 150 psi or a standard dimension ratio of 26 or less.

(3) No pipe which has been used for any purpose other than the conveyance of drinking water shall be accepted or relocated for use in any public drinking water supply.

(4) Water transmission and distribution lines must be installed in accordance with the manufacturer's instructions. However, the top of the waterline must be located below the frost line and in no case shall the top of the waterline be less than 24 inches below ground surface.

(5) The hydrostatic leakage rate shall not exceed the amount allowed or recommended by AWWA formulas.

(b) Lead ban. The following provisions apply to the use of lead in plumbing.

(1) The use of pipes and pipe fittings that contain more than 8.0% lead or solders and flux that contains more than 0.2% lead is prohibited in the following circumstances:

(A) for installation or repair of any public water supply; and

(B) for installation or repair of any plumbing in a residential or nonresidential facility providing water for human consumption and connected to a public drinking water supply system.

(2) This requirement will be waived for lead joints that are necessary for repairs to cast iron pipe.

(c) Minimum waterline sizes. The minimum waterline sizes are for domestic flows only and do not consider fire flows. Larger pipe sizes shall be used when the licensed professional engineer deems it necessary. It should be noted that the required sizes are based strictly on the number of customers to be served and not on the distances between connections or differences in elevation or the type of pipe. No new waterline under two inches in diameter will be allowed to be installed in a public water system distribution system. These minimum line sizes do not apply to individual customer service lines.

Figure: 30 TAC §290.44(c)

Maximum Number of Connections	Minimum Line Size (inches)
10	2
25	2.5
50	3
100	4
150	5
250	6
>250	8 and larger

(d) Minimum pressure requirement. The system must be designed to maintain a minimum pressure of 35 psi at all points within the distribution network at flow rates of at least 1.5 gallons per minute per connection. When the system is intended to provide fire fighting capability, it must also be designed to maintain a minimum pressure of 20 psi under combined fire and drinking water flow conditions.

(1) Air release devices shall be installed in the distribution system at all points where topography or other factors may create air locks in the lines. Air release devices shall be installed in such a manner as to preclude the possibility of submergence or possible entrance of contaminants. In this respect, all openings to the atmosphere shall be covered with 16-mesh or finer, corrosion-resistant screening material or an acceptable equivalent.

(2) When service is to be provided to more than one pressure plane or when distribution system conditions and demands are such that low pressures develop, the method of providing increased pressure shall be by means of booster pumps taking suction from storage tanks. If an exception to this requirement is desired, the designing engineer must furnish for the executive director's review all planning material for booster pumps taking suction from other than a storage tank. The planning material must contain a full description of the supply to the point of suction, maximum demands on this part of the system, location of pressure recorders, safety controls, and other pertinent information. Where booster pumps are installed to take suction directly from the distribution system, a minimum residual pressure of 20 psi must be maintained on the suction line at all times. Such installations must be equipped with automatic pressure cut-off devices so that the pumping units become inoperative at a suction pressure of less than 20 psi. In addition, a continuous pressure recording device may be required at a predetermined suspected critical pressure point on the suction line in order to record the hydraulic conditions in the line at all times. If such a record indicates critical minimum pressures (less than 20 psi), adequate storage facilities must be installed with the booster pumps taking suction from the storage facility. Fire pumps used to maintain pressure on automatic sprinkler systems only for fire protection purposes are not considered as in-line booster pumps.

(3) Service connections that require booster pumps taking suction from the public water system lines must be equipped with automatic pressure cut-off devices so that the pumping units become inoperative at a suction pressure of less than 20 psi. Where these types of installations are necessary, the preferred method of pressure maintenance consists of an air gapped connection with a storage tank and subsequent repressurization facilities.

(4) Each community public water system shall provide accurate metering devices at each residential, commercial, or industrial service connection for the accumulation of water usage data. A water system that furnishes the services or commodity only to itself or its employees when that service or commodity is not resold to or used by others is exempt from this requirement.

(5) The system shall be provided with sufficient valves and blowoffs so that necessary repairs can be made without undue interruption of service over any considerable area and for flushing the system when required. The engineering report shall establish criteria for this design.

(6) The system shall be designed to afford effective circulation of water with a minimum of dead ends. All dead-end mains shall be provided with acceptable flush valves and discharge piping. All dead-end lines less than two inches in diameter will not require flush valves if they end at a customer service. Where dead ends are necessary as a stage in the growth of the system, they shall be located and arranged to ultimately connect the ends to provide circulation.

(e) Location of waterlines. The following rules apply to installations of waterlines, wastewater mains or laterals, and other conveyances/appurtenances identified as potential sources of contamination.

Furthermore, all ratings specified shall be defined by ASTM or AWWA standards unless stated otherwise. New mains, service lines, or laterals are those that are installed where no main, service line, or lateral previously existed, or where existing mains, service lines, or laterals are replaced with pipes of different size or material.

(1) When new potable water distribution lines are constructed, they shall be installed no closer than nine feet in all directions to wastewater collection facilities. All separation distances shall be measured from the outside surface of each of the respective pieces.

(2) Potable water distribution lines and wastewater mains or laterals that form parallel utility lines shall be installed in separate trenches.

(3) No physical connection shall be made between a drinking water supply and a sewer line. Any appurtenance shall be designed and constructed so as to prevent any possibility of sewage entering the drinking water system.

(4) Where the nine-foot separation distance cannot be achieved, the following criteria shall apply.

(A) New waterline installation - parallel lines.

(i) Where a new potable waterline parallels an existing, non-pressure or pressure rated wastewater main or lateral and the licensed professional engineer licensed in the State of

Texas is able to determine that the existing wastewater main or lateral is not leaking, the new potable waterline shall be located at least two feet above the existing wastewater main or lateral, measured vertically, and at least four feet away, measured horizontally, from the existing wastewater main or lateral. Every effort shall be exerted not to disturb the bedding and backfill of the existing wastewater main or lateral.

(ii) Where a new potable waterline parallels an existing pressure rated wastewater main or lateral and it cannot be determined by the licensed professional engineer if the existing line is leaking, the existing wastewater main or lateral shall be replaced with at least 150 psi pressure rated pipe. The new potable waterline shall be located at least two feet above the new wastewater line, measured vertically, and at least four feet away, measured horizontally, from the replaced wastewater main or lateral.

(iii) Where a new potable waterline parallels a new wastewater main, the wastewater main or lateral shall be constructed of at least 150 psi pressure rated pipe. The new potable waterline shall be located at least two feet above the wastewater main or lateral, measured vertically, and at least four feet away, measured horizontally, from the wastewater main or lateral.

(B) New waterline installation - crossing lines.

(i) Where a new potable waterline crosses an existing, non-pressure rated wastewater main or lateral, one segment of the waterline pipe shall be centered over the wastewater main or lateral such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from

the centerline of the wastewater main or lateral. The potable waterline shall be at least two feet above the wastewater main or lateral. Whenever possible, the crossing shall be centered between the joints of the wastewater main or lateral. If the existing wastewater main or lateral is disturbed or shows signs of leaking, it shall be replaced for at least nine feet in both directions (18 feet total) with at least 150 psi pressure rated pipe.

(ii) Where a new potable waterline crosses an existing, pressure rated wastewater main or lateral, one segment of the waterline pipe shall be centered over the wastewater main or lateral such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the centerline of the wastewater main or lateral. The potable waterline shall be at least six inches above the wastewater main or lateral. Whenever possible, the crossing shall be centered between the joints of the wastewater main or lateral. If the existing wastewater main or lateral shows signs of leaking, it shall be replaced for at least nine feet in both directions (18 feet total) with at least 150 psi pressure rated pipe.

(iii) Where a new potable waterline crosses a new, non-pressure rated wastewater main or lateral and the standard pipe segment length of the wastewater main or lateral is at least 18 feet, one segment of the waterline pipe shall be centered over the wastewater main or lateral such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the centerline of the wastewater main or lateral. The potable waterline shall be at least two feet above the wastewater main or lateral. Whenever possible, the crossing shall be centered between the joints of the wastewater main or lateral. The wastewater pipe shall have a minimum pipe stiffness of 115 psi at 5.0% deflection. The wastewater main or lateral shall be embedded in cement stabilized sand (see clause (vi) of this subparagraph) for the total length of one pipe segment plus 12 inches beyond the joint on each end.

(iv) Where a new potable waterline crosses a new, non-pressure rated wastewater main or lateral and a standard length of the wastewater pipe is less than 18 feet in length, the potable water pipe segment shall be centered over the wastewater line. The materials and method of installation shall conform with one of the following options.

(I) Within nine feet horizontally of either side of the waterline, the wastewater pipe and joints shall be constructed with pipe material having a minimum pressure rating of at least 150 psi. An absolute minimum vertical separation distance of two feet shall be provided. The wastewater main or lateral shall be located below the waterline.

(II) All sections of wastewater main or lateral within nine feet horizontally of the waterline shall be encased in an 18-foot (or longer) section of pipe. Flexible encasing pipe shall have a minimum pipe stiffness of 115 psi at 5.0% deflection. The encasing pipe shall be centered on the waterline and shall be at least two nominal pipe diameters larger than the wastewater main or lateral. The space around the carrier pipe shall be supported at five-foot (or less) intervals with spacers or be filled to the springline with washed sand. Each end of the casing shall be sealed with watertight non-shrink cement grout or a manufactured watertight seal. An absolute minimum separation distance of six inches between the encasement pipe and the waterline shall be provided. The wastewater line shall be located below the waterline.

(III) When a new waterline crosses under a wastewater main or lateral, the waterline shall be encased as described for wastewater mains or laterals in subclause (II) of

this clause or constructed of ductile iron or steel pipe with mechanical or welded joints as appropriate. An absolute minimum separation distance of one foot between the waterline and the wastewater main or lateral shall be provided. Both the waterline and wastewater main or lateral must pass a pressure and leakage test as specified in AWWA C600 standards.

(v) Where a new potable waterline crosses a new, pressure rated wastewater main or lateral, one segment of the waterline pipe shall be centered over the wastewater line such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the center line of the wastewater main or lateral. The potable waterline shall be at least six inches above the wastewater main or lateral. Whenever possible, the crossing shall be centered between the joints of the wastewater main or lateral. The wastewater pipe shall have a minimum pressure rating of at least 150 psi. The wastewater main or lateral shall be embedded in cement stabilized sand (see clause (vi) of this subparagraph) for the total length of one pipe segment plus 12 inches beyond the joint on each end.

(vi) Where cement stabilized sand bedding is required, the cement stabilized sand shall have a minimum of 10% cement per cubic yard of cement stabilized sand mixture, based on loose dry weight volume (at least 2.5 bags of cement per cubic yard of mixture). The cement stabilized sand bedding shall be a minimum of six inches above and four inches below the wastewater main or lateral. The use of brown coloring in cement stabilized sand for wastewater main or lateral bedding is recommended for the identification of pressure rated wastewater mains during future construction.

(5) Waterline and wastewater main or lateral manhole or cleanout separation. The separation distance from a potable waterline to a wastewater main or lateral manhole or cleanout shall be a minimum of nine feet. Where the nine-foot separation distance cannot be achieved, the potable waterline shall be encased in a joint of at least 150 psi pressure class pipe at least 18 feet long and two nominal sizes larger than the new conveyance. The space around the carrier pipe shall be supported at five-foot intervals with spacers or be filled to the springline with washed sand. The encasement pipe shall be centered on the crossing and both ends sealed with cement grout or manufactured sealant.

(6) Location of fire hydrants. Fire hydrants shall not be installed within nine feet vertically or horizontally of any wastewater main, wastewater lateral, or wastewater service line regardless of construction.

(7) Location of potable or raw water supply or suction lines. Suction mains to pumping equipment shall not cross wastewater mains, wastewater laterals, or wastewater service lines. Raw water supply lines shall not be installed within five feet of any tile or concrete wastewater main, wastewater lateral, or wastewater service line.

(8) Proximity of septic tank drainfields. Waterlines shall not be installed closer than ten feet to septic tank drainfields.

(f) Sanitary precautions and disinfection. Sanitary precautions, flushing, disinfection procedures, and microbiological sampling as prescribed in AWWA standards for disinfecting water mains shall be followed in laying waterlines.

(1) Pipe shall not be laid in water or placed where it can be flooded with water or sewage during its storage or installation.

(2) Special precautions must be taken when waterlines are laid under any flowing or intermittent stream or semipermanent body of water such as marsh, bay, or estuary. In these cases, the water main shall be installed in a separate watertight pipe encasement and valves must be provided on each side of the crossing with facilities to allow the underwater portion of the system to be isolated and tested to determine that there are no leaks in the underwater line. Alternately, and with the permission of the executive director, the watertight pipe encasement may be omitted.

(3) New mains shall be thoroughly disinfected in accordance with AWWA Standard C651 and then flushed and sampled before being placed in service. Samples shall be collected for microbiological analysis to check the effectiveness of the disinfection procedure. Sampling shall be repeated if contamination persists. A minimum of one sample for each 1,000 feet of completed waterline will be required or at the next available sampling point beyond 1,000 feet as designated by the design engineer.

(g) Interconnections.

(1) Each proposal for a direct connection between public drinking water systems under separate administrative authority will be considered on an individual basis.

(A) Documents covering the responsibility for sanitary control shall accompany the submitted planning material.

(B) Each water supply shall be of a safe, potable quality.

(2) Where an interconnection between systems is proposed to provide a second source of supply for one or both systems, the system being utilized as a second source of supply must be capable of supplying a minimum of 0.35 gallons per minute per connection for the total number of connections in the combined distribution systems.

(h) Backflow, siphonage.

(1) No water connection from any public drinking water supply system shall be allowed to any residence or establishment where an actual or potential contamination hazard exists unless the public water facilities are protected from contamination.

(A) At any residence or establishment where an actual or potential contamination hazard exists, additional protection shall be required at the meter in the form of an air gap or backflow prevention assembly. The type of backflow prevention assembly required shall be determined by the specific potential hazard identified in §290.47(i) of this title (relating to Appendices).

(B) At any residence or establishment where an actual or potential contamination hazard exists and an adequate internal cross-connection control program is in effect, backflow protection at the water service entrance or meter is not required.

(i) An adequate internal cross-connection control program shall include an annual inspection and testing by a certified backflow prevention assembly tester on all backflow prevention assemblies used for health hazard protection.

(ii) Copies of all such inspection and test reports must be obtained and kept on file by the water purveyor.

(iii) It will be the responsibility of the water purveyor to ensure that these requirements are met.

(2) No water connection from any public drinking water supply system shall be connected to any condensing, cooling, or industrial process or any other system of nonpotable usage over which the public water supply system officials do not have sanitary control, unless the said connection is made in accordance with the requirements of paragraph (1) of this subsection. Water from such systems cannot be returned to the potable water supply.

(3) Overhead bulk water dispensing stations must be provided with an air gap between the filling outlet hose and the receiving tank to protect against back siphonage and cross-contamination.

(4) All backflow prevention assemblies that are required according to this section and associated table located in §290.47(i) of this title shall be tested upon installation by a recognized backflow prevention assembly tester and certified to be operating within specifications. Backflow prevention assemblies which are installed to provide protection against health hazards must also be tested and certified to be operating within specifications at least annually by a recognized backflow prevention assembly tester.

(A) Recognized backflow prevention assembly testers shall have completed an executive director approved course on cross-connection control and backflow prevention assembly testing, pass an examination administered by the executive director, and hold a current license as a backflow prevention assembly tester.

(i) Backflow prevention assembly testers are qualified to test and repair assemblies on any domestic, commercial, industrial, or irrigation service.

(ii) Backflow prevention assembly testers may test and repair assemblies on firelines only if they are permanently employed by an Approved Fireline Contractor. The State Fire Marshal's office requires that any person performing maintenance on firelines must be employed by an Approved Fireline Contractor.

(B) Gauges used in the testing of backflow prevention assemblies shall be tested for accuracy annually in accordance with the University of Southern California's Manual of Cross-Connection Control or the American Water Works Association Recommended Practice for Backflow

Prevention and Cross-Connection Control (Manual M14). Public water systems shall require testers to include test gauge serial numbers on "Test and Maintenance" report forms and ensure testers have gauges tested for accuracy.

(C) A test report must be completed by the recognized backflow prevention assembly tester for each assembly tested. The signed and dated original must be submitted to the public water supplier for recordkeeping purposes. Any form which varies from the format specified in Appendix F located in §290.47(f) of this title must be approved by the executive director prior to being placed in use.

(5) The use of a backflow prevention assembly at the service connection shall be considered as additional backflow protection and shall not negate the use of backflow protection on internal hazards as outlined and enforced by local plumbing codes.

(6) At any residence or establishment where there is no actual or potential contamination hazard, a backflow prevention assembly is not required.

(i) Water hauling. When drinking water is distributed by tank truck or trailer, it must be accomplished in the following manner.

(1) Water shall be obtained from an approved source.

(2) The equipment used to haul the water must be approved by the executive director and must be constructed as follows.

(A) The tank truck or trailer shall be used for transporting drinking water only and shall be labeled "Drinking Water." Tanks which have been used previously for purposes other than transporting potable liquids shall not be used for hauling drinking water.

(B) The tank shall be watertight and of an approved material which is impervious and easily cleaned and disinfected. Any paint or coating and any plastic or fiberglass materials used as contact surfaces must be approved by the United States Environmental Protection Agency, the United States Food and Drug Administration, or the NSF. Effective January 1, 1993, any newly installed surfaces shall conform to ANSI/NSF Standard 61 and must be certified by an organization accredited by ANSI.

(C) The tank shall have a manhole and a manhole cover which overlaps the raised manhole opening by a minimum of two inches and terminates in a downward direction. The cover shall fit firmly on the manhole opening and shall be kept locked.

(D) The tank shall have a vent which is faced downward and located to minimize the possibility of drawing contaminants into the stored water. The vent must be screened with 16-mesh or finer corrosion-resistant material.

(E) Connections for filling and emptying the tank shall be properly protected to prevent the possible entrance of contamination. These openings must be provided with caps and keeper chains.

(F) A drain shall be provided which will completely empty the tank for cleaning or repairs.

(G) When a pump is used to transfer the water from the tank, the pump shall be permanently mounted with a permanent connection to the tank. The discharge side of the pump shall be properly protected between uses by a protective cap and keeper chain.

(H) Hoses used for the transfer of drinking water to and from the tank shall be used only for that purpose and labeled for drinking water only. The hoses shall conform to ANSI/NSF Standard 61 and must be certified by an entity recognized by the commission. Hoses and related appurtenances must be cleaned and disinfected on a regular basis during prolonged use or before start-up during intermittent use. Hoses must be properly stored between uses and must be provided with caps and keeper chains or have the ends connected together.

(I) The tank shall be disinfected monthly and at any time that contamination is suspected.

(J) At least one sample per month from each tank shall be collected and submitted for microbiological analysis to one of the commission's approved laboratories for each month of operation.

(K) A minimum free chlorine residual of 0.5 mg/L or, if chloramines are used as the primary disinfectant, a chloramine residual of 1.0 mg/L (measured as total chlorine) shall be maintained in the water being hauled. Chlorine or chlorine containing compounds may be added on a "batch" basis to maintain the required residual.

(L) Operational records detailing the amount of water hauled, purchases, microbiological sampling results, chlorine residual readings, dates of disinfection, and source of water shall be maintained.

§290.45. Minimum Water System Capacity Requirements.

(a) General provisions.

(1) The requirements contained in this section are to be used in evaluating both the total capacities for public water systems and the capacities at individual pump stations and pressure planes which serve portions of the system that are hydraulically separated from, or incapable of being served by, other pump stations or pressure planes. The capacities specified in this section are minimum requirements only.

(2) The executive director will require additional supply, storage, service pumping, and pressure maintenance facilities if a normal operating pressure of 35 pounds per square inch (psi) cannot be maintained throughout the system, or if the system's maximum daily demand exceeds its total production and treatment capacity. The executive director will also require additional capacities if the system is unable to maintain a minimum pressure of 20 psi during fire fighting, line flushing, and other unusual conditions.

(3) The executive director may establish additional capacity requirements for a public water system using the method of calculation described in subsection (g)(2) of this section if there are repeated customer complaints regarding inadequate pressure or if the executive director receives a request for a capacity evaluation from customers of the system.

(4) Throughout this section, total storage capacity does not include pressure tank capacity.

(5) The executive director may exclude the capacity of facilities that have been inoperative for the past 120 days and will not be returned to an operative condition within the next 30 days when determining compliance with the requirements of this section.

(6) The capacity of the treatment facilities shall not be less than the required raw water or groundwater production rate or the anticipated maximum daily demand of the system.

(b) Community water systems.

(1) Groundwater supplies must meet the following requirements.

(A) If fewer than 50 connections without ground storage, the system must meet the following requirements:

(i) a well capacity of 1.5 gallons per minute (gpm) per connection; and

(ii) a pressure tank capacity of 50 gallons per connection.

(B) If fewer than 50 connections with ground storage, the system must meet the following requirements:

(i) a well capacity of 0.6 gpm per connection;

(ii) a total storage capacity of 200 gallons per connection;

(iii) two or more service pumps having a total capacity of 2.0 gpm per connection; and

(iv) a pressure tank capacity of 20 gallons per connection.

(C) For 50 to 250 connections, the system must meet the following requirements:

(i) a well capacity of 0.6 gpm per connection;

(ii) a total storage capacity of 200 gallons per connection;

(iii) two or more pumps having a total capacity of 2.0 gpm per connection at each pump station or pressure plane. For systems which provide an elevated storage capacity of 200 gallons per connection, two service pumps with a minimum combined capacity of 0.6 gpm per connection are required at each pump station or pressure plane. If only wells and elevated storage are provided, service pumps are not required; and

(iv) an elevated storage capacity of 100 gallons per connection or a pressure tank capacity of 20 gallons per connection.

(D) For more than 250 connections, the system must meet the following requirements:

(i) two or more wells having a total capacity of 0.6 gpm per connection. Where an interconnection is provided with another acceptable water system capable of supplying at least 0.35 gpm for each connection in the combined system under emergency conditions, an additional well will not be required as long as the 0.6 gpm per connection requirement is met for each system on an individual basis. Each water system must still meet the storage and pressure maintenance requirements on

an individual basis unless the interconnection is permanently open. In this case, the systems' capacities will be rated as though a single system existed;

(ii) a total storage capacity of 200 gallons per connection;

(iii) two or more pumps that have a total capacity of 2.0 gpm per connection or that have a total capacity of at least 1,000 gpm and the ability to meet peak hourly demands with the largest pump out of service, whichever is less, at each pump station or pressure plane. For systems which provide an elevated storage capacity of 200 gallons per connection, two service pumps with a minimum combined capacity of 0.6 gpm per connection are required at each pump station or pressure plane. If only wells and elevated storage are provided, service pumps are not required;

(iv) an elevated storage capacity of 100 gallons per connection or a pressure tank capacity of 20 gallons per connection. If pressure tanks are used, a maximum capacity of 30,000 gallons is sufficient for up to 2,500 connections. An elevated storage capacity of 100 gallons per connection is required for systems with more than 2,500 connections. Alternate methods of pressure maintenance may be proposed and will be approved if the criteria contained in subsection (g)(5) of this section are met; and

(v) emergency power for systems which serve more than 250 connections and do not meet the elevated storage requirement. Sufficient emergency power must be provided to deliver a minimum of 0.35 gpm per connection to the distribution system in the event of the loss of normal power supply. Alternately, an emergency interconnection can be provided with another

public water system that has emergency power and is able to supply at least 0.35 gpm for each connection in the combined system. Emergency power facilities in systems serving 1,000 connections or greater must be serviced and maintained in accordance with level 2 maintenance requirements contained in the current National Fire Protection Association (NFPA) 110 standards. Although not required, compliance with NFPA 110 standards is highly recommended for systems serving less than 1,000 connections. Logs of all emergency power use and maintenance must be maintained and kept on file for a period of not less than three years. These records must be made available, upon request, for executive director review.

(E) Mobile home parks with a density of eight or more units per acre and apartment complexes which supply fewer than 100 connections without ground storage must meet the following requirements:

(i) a well capacity of 1.0 gpm per connection; and

(ii) a pressure tank capacity of 50 gallons per connection with a maximum of 2,500 gallons required.

(F) Mobile home parks and apartment complexes which supply 100 connections or greater, or fewer than 100 connections and utilize ground storage must meet the following requirements:

(i) a well capacity of 0.6 gpm per connection. Systems with 250 or more connections must have either two wells or an approved interconnection which is capable of supplying at least 0.35 gpm for each connection in the combined system;

(ii) a total storage of 200 gallons per connection;

(iii) at least two service pumps with a total capacity of 2.0 gpm per connection; and

(iv) a pressure tank capacity of 20 gallons per connection.

(2) Surface water supplies must meet the following requirements:

(A) a raw water pump capacity of 0.6 gpm per connection with the largest pump out of service;

(B) a treatment plant capacity of 0.6 gpm per connection under normal rated design flow;

(C) transfer pumps (where applicable) with a capacity of 0.6 gpm per connection with the largest pump out of service;

(D) a covered clearwell storage capacity at the treatment plant of 50 gallons per connection or, for systems serving more than 250 connections, 5.0% of daily plant capacity;

(E) a total storage capacity of 200 gallons per connection;

(F) a service pump capacity that provides each pump station or pressure plane with two or more pumps that have a total capacity of 2.0 gpm per connection or that have a total capacity of at least 1,000 gpm and the ability to meet peak hourly demands with the largest pump out of service, whichever is less. For systems which provide an elevated storage capacity of 200 gallons per connection, two service pumps with a minimum combined capacity of 0.6 gpm per connection are required at each pump station or pressure plane;

(G) an elevated storage capacity of 100 gallons per connection or a pressure tank capacity of 20 gallons per connection. If pressure tanks are used, a maximum capacity of 30,000 gallons is sufficient for systems of up to 2,500 connections. An elevated storage capacity of 100 gallons per connection is required for systems with more than 2,500 connections. Alternate methods of pressure maintenance may be proposed and will be approved if the criteria contained in subsection (g)(5) of this section are met; and

(H) emergency power for systems which serve more than 250 connections and do not meet the elevated storage requirement. Sufficient emergency power must be provided to deliver a minimum of 0.35 gpm per connection to the distribution system in the event of the loss of normal power supply. Alternately, an emergency interconnection can be provided with another public water system that

has emergency power and is able to supply at least 0.35 gpm for each connection in the combined system. Emergency power facilities in systems serving 1,000 connections or greater must be serviced and maintained in accordance with level 2 maintenance requirements contained in the current NFPA 110 standards. Although not required, compliance with NFPA 110 standards is highly recommended for systems serving less than 1,000 connections. Logs of all emergency power use and maintenance must be maintained and kept on file for a period of not less than three years. These records must be made available, upon request, for executive director review.

(c) Noncommunity water systems serving transient accommodation units. The following water capacity requirements apply to noncommunity water systems serving accommodation units such as hotel rooms, motel rooms, travel trailer spaces, campsites, and similar accommodations.

(1) Groundwater supplies must meet the following requirements.

(A) If fewer than 100 accommodation units without ground storage, the system must meet the following requirements:

(i) a well capacity of 1.0 gpm per unit; and

(ii) a pressure tank capacity of ten gallons per unit with a minimum of 220 gallons.

(B) For systems serving fewer than 100 accommodation units with ground storage or serving 100 or more accommodation units, the system must meet the following requirements:

(i) a well capacity of 0.6 gpm per unit;

(ii) a ground storage capacity of 35 gallons per unit;

(iii) two or more service pumps which have a total capacity of 1.0 gpm per unit; and

(iv) a pressure tank capacity of ten gallons per unit.

(2) Surface water supplies, regardless of size, must meet the following requirements:

(A) a raw water pump capacity of 0.6 gpm per unit with the largest pump out of service;

(B) a treatment plant capacity of 0.6 gpm per unit;

(C) a transfer pump capacity (where applicable) of 0.6 gpm per unit with the largest pump out of service;

(D) a ground storage capacity of 35 gallons per unit with a minimum of 1,000 gallons as clearwell capacity;

(E) two or more service pumps with a total capacity of 1.0 gpm per unit; and

(F) a pressure tank capacity of ten gallons per unit with a minimum requirement of 220 gallons.

(d) Noncommunity water systems serving other than transient accommodation units.

(1) The following table is applicable to paragraphs (2) and (3) of this subsection and shall be used to determine the maximum daily demand for the various types of facilities listed.

Figure: 30 TAC §290.45(d)(1)

Table A

Type of Establishment	Gallons/Person/Day
Restaurants.	18
Schools without cafeterias, gymnasiums, or showers.	18
Schools with cafeterias, but no gymnasiums or showers.	24
Schools with cafeterias, gymnasiums, and showers.	30
Youth camps without flush toilets, showers, or dining halls.	6
Youth camps with flush toilets, but no showers or dining halls. . .	24
Youth camps with flush toilets, showers, and dining halls.	42
Office buildings.	18
Hospitals (based on number of beds).	720
Institutions, other than hospitals.	240
Factories (exclusive of industrial processes).	24
Parks.	6
Swimming pools.	12
Country clubs.	120
Airports (per passenger).	6
Self-service laundries.	60

Service stations/stores. 12

It should be noted that this table is used to determine minimum capacities only and that the overriding criteria will be the ability of the system to maintain a minimum pressure of 35 psi under normal operating conditions. Minimum distribution pressure shall not be less than 20 psi at any time.

(2) Groundwater supplies must meet the following requirements.

(A) Subject to the requirements of subparagraph (B) of this paragraph, if fewer than 300 persons per day are served, the system must meet the following requirements:

(i) a well capacity which meets or exceeds the maximum daily demand of the system during the hours of operation; and

(ii) a minimum pressure tank capacity of 220 gallons with additional capacity, if necessary, based on a sanitary survey conducted by the executive director.

(B) Systems which serve 300 or more persons per day or serve fewer than 300 persons per day and provide ground storage must meet the following requirements:

(i) a well capacity which meets or exceeds the maximum daily demand;

(ii) a ground storage capacity which is equal to 50% of the maximum daily demand;

(iii) if the maximum daily demand is less than 15 gpm, at least one service pump with a capacity of three times the maximum daily demand;

(iv) if the maximum daily demand is 15 gpm or more, at least two service pumps with a total capacity of three times the maximum daily demand; and

(v) a minimum pressure tank capacity of 220 gallons with additional capacity, if necessary, based on a sanitary survey conducted by the executive director.

(3) Each surface water supply or groundwater supply that is under the direct influence of surface water, regardless of size, must meet the following requirements:

(A) a raw water pump capacity which meets or exceeds the maximum daily demand of the system with the largest pump out of service;

(B) a treatment plant capacity which meets or exceeds the system's maximum daily demand;

(C) a transfer pump capacity (where applicable) sufficient to meet the maximum daily demand with the largest pump out of service;

(D) a clearwell capacity which is equal to 50% of the maximum daily demand;

(E) two or more service pumps with a total capacity of three times the maximum daily demand; and

(F) a minimum pressure tank capacity of 220 gallons with additional capacity, if necessary, based on a sanitary survey conducted by the executive director.

(e) Water wholesalers. The following additional requirements apply to systems which supply wholesale treated water to other public water supplies.

(1) All wholesalers must provide enough production, treatment, and service pumping capacity to meet or exceed the combined maximum daily commitments specified in their various contractual obligations.

(2) For wholesale water suppliers, minimum water system capacity requirements shall be determined by calculating the requirements based upon the number of retail customer service connections of that wholesale water supplier, if any, and adding that amount to the maximum amount of water obligated or pledged under all wholesale contracts.

(3) Emergency power is required for each portion of the system which supplies more than 250 connections under direct pressure and does not provide an elevated storage capacity of at least 100 gallons per connection. If emergency power is required, it must be sufficient to deliver 20% of the minimum required service pump capacity in the event of the loss of normal power supply. When the wholesaler provides water through an air gap into the purchaser's storage facilities it will be the

purchaser's responsibility to meet all minimum water system capacity requirements including emergency power.

(f) Purchased water systems. The following requirements apply only to systems which purchase treated water to meet all or part of their production, storage, service pump, or pressure maintenance capacity requirements.

(1) The water purchase contract must be available to the executive director in order that production, storage, service pump, or pressure maintenance capacity may be properly evaluated. For purposes of this section, a contract may be defined as a signed written document of specific terms agreeable to the water purchaser and the water wholesaler, or in its absence, a memorandum or letter of understanding between the water purchaser and the water wholesaler.

(2) The contract shall authorize the purchase of enough water to meet the monthly or annual needs of the purchaser.

(3) The contract shall also establish the maximum rate at which water may be drafted on a daily and hourly basis. In the absence of specific maximum daily or maximum hourly rates in the contract, a uniform purchase rate for the contract period will be used.

(4) The maximum authorized daily purchase rate specified in the contract, or a uniform purchase rate in the absence of a specified daily purchase rate, plus the actual production capacity of the system must be at least 0.6 gpm per connection.

(5) For systems which purchase water under direct pressure, the maximum hourly purchase authorized by the contract plus the actual service pump capacity of the system must be at least 2.0 gpm per connection or provide at least 1,000 gpm and be able to meet peak hourly demands, whichever is less.

(6) The purchaser is responsible for meeting all production requirements. If additional capacity to meet increased demands cannot be attained from the wholesaler through a new or amended contract, additional capacity must be obtained from water purchase contracts with other entities, new wells, or surface water treatment facilities. However, if the water purchase contract prohibits the purchaser from securing water from sources other than the wholesaler, the wholesaler is responsible for meeting all production requirements.

(7) All other minimum capacity requirements specified in this section shall apply.

(g) Alternative capacity requirements. Public water systems may request approval to meet alternative capacity requirements in lieu of the minimum capacity requirements specified in this section. Any water system requesting to use an alternative capacity requirement must demonstrate to the satisfaction of the executive director that approving the request will not compromise the public health or result in a degradation of service or water quality. Alternative capacity requirements are unavailable for groundwater systems serving fewer than 50 connections without total storage as specified in subsection (b)(1) of this section or for noncommunity water systems as specified in subsections (c) and (d) of this section.

(1) Alternative capacity requirements for public water systems may be granted upon request to and approval by the executive director. The request to use an alternative capacity requirement must include:

(A) a detailed inventory of the major production, pressurization, and storage facilities utilized by the system;

(B) records kept by the water system that document the daily production of the system. The period reviewed shall not be less than three years. The applicant may not use a calculated peak daily demand;

(C) data acquired during the last drought period in the region, if required by the executive director;

(D) the actual number of active connections for each month during the three years of production data;

(E) description of any unusual demands on the system such as fire flows or major main breaks that will invalidate unusual peak demands experienced in the study period;

(F) any other relevant data needed to determine that the proposed alternative capacity requirement will provide at least 35 psi in the public water system except during line repair or during fire fighting when it cannot be less than 20 psi; and

(G) a copy of all data relied upon for making the proposed determination.

(2) Alternative capacity requirements for existing public water systems must be based upon the maximum daily demand for the system, unless the request is submitted by a licensed professional engineer in accordance with the requirements of paragraph (3) of this subsection. The maximum daily demand must be determined based upon the daily usage data contained in monthly operating reports for the system during a 36 consecutive month period. The 36 consecutive month period must end within 90 days of the date of submission to ensure the data is as current as possible.

(A) Maximum daily demand is the greatest number of gallons, including groundwater, surface water, and purchased water delivered by the system during any single day during the review period. Maximum daily demand excludes unusual demands on the system such as fire flows or major main breaks.

(B) For the purpose of calculating alternative capacity requirements, an equivalency ratio must be established. This equivalency ratio must be calculated by multiplying the maximum daily demand, expressed in gpm per connection, by a fixed safety factor and dividing the result by 0.6 gpm per connection. The safety factor shall be 1.15 unless it is documented that the existing system capacity is adequate for the next five years. In this case, the safety factor may be reduced to 1.05.

The conditions in §291.93(3) of this title (relating to Adequacy of Water Utility Service) concerning the 85% rule shall continue to apply to public water systems that are also retail public utilities.

(C) To calculate the alternative capacity requirements, the equivalency ratio must be multiplied by the appropriate minimum capacity requirements specified in subsection (b) of this section. Standard rounding methods are used to round calculated alternative production capacity requirement values to the nearest one-hundredth.

(3) Alternative capacity requirements which are proposed and submitted by licensed professional engineers for review are subject to the following additional requirements.

(A) A signed and sealed statement by the licensed professional engineer must be provided which certifies that the proposed alternative capacity requirements have been determined in accordance with the requirements of this subsection.

(B) If the system is new or at least 36 consecutive months of data is not available, maximum daily demand may be based upon at least 36 consecutive months of data from a comparable public water system. A licensed professional engineer must certify that the data from another public water system is comparable based on consideration of the following factors: prevailing land use patterns (rural versus urban); number of connections; density of service populations; fire flow obligations; and socio-economic, climatic, geographic, and topographic considerations as well as other factors as may be relevant. The comparable public water system shall not exhibit any of the conditions listed in paragraph (6)(A) of this subsection.

(4) The executive director shall consider requests for alternative capacity requirements in accordance with the following requirements.

(A) For those requests submitted under the seal of a licensed professional engineer, the executive director must mail written acceptance or denial of the proposed alternative capacity requirements to the public water system within 90 days from the date of submission. If the executive director fails to mail written notification within 90 days, the alternative capacity requirements submitted by a licensed professional engineer automatically become the alternative capacity requirements for the public water system.

(B) If the executive director denies the request:

(i) the executive director shall mail written notice to the public water system identifying the specific reason or reasons for denial and allow 45 days for the public water system to respond to the reason(s) for denial;

(ii) the denial is final if no response from the public water system is received within 45 days of the written notice being mailed; and

(iii) the executive director must mail a final written approval or denial within 60 days from the receipt of any response timely submitted by the public water system.

(5) Although elevated storage is the preferred method of pressure maintenance for systems of over 2,500 connections, it is recognized that local conditions may dictate the use of alternate methods utilizing hydropneumatic tanks and on-site emergency power equipment. Alternative capacity requirements to the elevated storage requirements may be obtained based on request to and approval by the executive director. Special conditions apply to systems qualifying for an elevated storage alternative capacity requirement.

(A) The system must submit documentation sufficient to assure that the alternate method of pressure maintenance is capable of providing a safe and uninterrupted supply of water under pressure to the distribution system during all demand conditions.

(i) A signed and sealed statement by a licensed professional engineer must be provided which certifies that the pressure maintenance facilities are sized, designed, and capable of providing a minimum pressure of at least 35 psi at all points within the distribution network at flow rates of 1.5 gpm per connection or greater. In addition, the engineer must certify that the emergency power facilities are capable of providing the greater of the average daily demand or 0.35 gpm per connection while maintaining distribution pressures of at least 35 psi, and that emergency power facilities powering production and treatment facilities are capable of supplying at least 0.35 gpm per connection to storage.

(ii) The system's licensed professional engineer must conduct a hydraulic analysis of the system under peak conditions. This must include an analysis of the time lag between the loss of the normal power supply and the commencement of emergency power as well as the minimum

pressure that will be maintained within the distribution system during this time lag. In no case shall this minimum pressure within the distribution system be less than 20 psi. The results of this analysis must be submitted to the executive director for review.

(iii) For existing systems, the system's licensed professional engineer must provide continuous pressure chart recordings of distribution pressures maintained during past power failures, if available. The period reviewed shall not be less than three years.

(B) Emergency power facilities must be maintained and provided with necessary appurtenances to assure immediate and dependable operation in case of normal power interruption.

(i) The facilities must be serviced and maintained in accordance with level 2 maintenance requirements contained in the current NFPA 110 standards and the manufacturers' recommendations.

(ii) The switching gear must be capable of bringing the emergency power generating equipment on-line during a power interruption such that the pressure in the distribution network does not fall below 20 psi at any time.

(iii) The minimum on-site fuel storage capacity shall be determined by the fuel demand of the emergency power facilities and the frequency of fuel delivery. An amount of fuel equal to that required to operate the facilities under-load for a period of at least eight hours must always be maintained on site.

(iv) Residential rated mufflers or other means of effective noise suppression must be provided on each emergency power motor.

(C) Battery-powered or uninterrupted power supply pressure monitors and chart recorders which are configured to activate immediately upon loss of normal power must be provided for pressure maintenance facilities. These records must be kept for a minimum of three years and made available for review by the executive director. Records must include chart recordings of all power interruptions including interruptions due to periodic emergency power under-load testing and maintenance.

(D) An emergency response plan must be submitted detailing procedures to be followed and individuals to be contacted in the event of loss of normal power supply.

(6) Any alternative capacity requirement granted under this subsection is subject to review and revocation or revision by the executive director. If permission to use an alternative capacity requirement is revoked, the public water system must meet the applicable minimum capacity requirements of this section.

(A) The following conditions, if attributable to the alternative capacity requirements, may constitute grounds for revocation or revision of established alternative capacity requirements or for denial of new requests, if the condition occurred within the last 36 months:

(i) documented pressure below 35 psi at any time not related to line repair, except during fire fighting when it cannot be less than 20 psi;

(ii) water outages due to high water usage;

(iii) mandatory water rationing due to high customer demand or overtaxed water production or supply facilities;

(iv) failure to meet a minimum capacity requirement or an established alternative capacity requirement;

(v) changes in water supply conditions or usage patterns which create a potential threat to public health; or

(vi) any other condition where the executive director finds that the alternative capacity requirement has compromised the public health or resulted in a degradation of service or water quality.

(B) If the executive director finds any of the conditions specified in subparagraph (A) of this paragraph, the process for revocation or revision of an alternative capacity requirement shall be as follows, unless the executive director finds that failure of the service or other threat to public health and safety is imminent under subparagraph (C) of this paragraph.

(i) The executive director must mail the public drinking water system written notice of the executive director's intent to revoke or revise an alternative capacity requirement identifying the specific reason(s) for the proposed action.

(ii) The public water system has 30 days from the date the written notice is mailed to respond to the proposed action.

(iii) The public water system has 30 days from the date the written notice is mailed to request a meeting with the agency's public drinking water program personnel to review the proposal. If requested, such a meeting must occur within 45 days of the date the written notice is mailed.

(iv) After considering any response from or after any requested meeting with the public drinking water system, the executive director must mail written notification to the public drinking water system of the executive director's final decision to continue, revoke, or revise an alternative capacity requirement identifying the specific reason(s) for the decision.

(C) If the executive director finds that failure of the service or other threat to public health and safety is imminent, the executive director may issue written notification of the executive director's final decision to revoke or revise an alternative capacity requirement at any time.

§290.46. Minimum Acceptable Operating Practices for Public Drinking Water Systems.

(a) General. When a public drinking water supply system is to be established, plans shall be submitted to the executive director for review and approval prior to the construction of the system. All public water systems are to be constructed in conformance with the requirements of this subchapter and maintained and operated in accordance with the following minimum acceptable operating practices. Owners and operators shall allow entry to members of the commission and employees and agents of the commission onto any public or private property at any reasonable time for the purpose of inspecting and investigating conditions relating to public water systems in the state. Members, employees, or agents acting under this authority shall observe the establishment's rules and regulations concerning safety, internal security, and fire protection, and if the property has management in residence, shall notify management or the person then in charge of his presence and shall exhibit proper credentials.

(b) Microbiological. Submission of samples for microbiological analysis shall be as required by Subchapter F of this chapter (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems). Microbiological samples may be required by the executive director for monitoring purposes in addition to the routine samples required by the drinking water standards. These samples shall be submitted to a certified laboratory. (A list of the certified laboratories can be obtained by contacting the executive director).

(c) Chemical. Samples for chemical analysis shall be submitted as directed by the executive director.

(d) Disinfectant residuals and monitoring. A disinfectant residual must be continuously maintained during the treatment process and throughout the distribution system.

(1) Disinfection equipment shall be operated and monitored in a manner that will assure compliance with the requirements of §290.110 of this title (relating to Disinfectant Residuals).

(2) The disinfection equipment shall be operated to maintain the following minimum disinfectant residuals in each finished water storage tank and throughout the distribution system at all times:

(A) a free chlorine residual of 0.2 milligrams per liter (mg/L); or

(B) a chloramine residual of 0.5 mg/L (measured as total chlorine) for those systems that feed ammonia.

(e) Operation by trained and licensed personnel. Except as provided in paragraph (1) of this subsection, the production, treatment, and distribution facilities at the public water system must be operated at all times under the direct supervision of a water works operator who holds an applicable, valid license issued by the executive director.

(1) Transient noncommunity public water systems are exempt from the requirements of this subsection if they use only groundwater or purchase treated water from another public water system.

(2) All public water systems that are subject to the provisions of this subsection shall meet the following requirements.

(A) Public water systems shall not allow new or repaired production, treatment, storage, pressure maintenance, or distribution facilities to be placed into service without the prior guidance and approval of a licensed water works operator.

(B) Public water systems shall ensure that their operators are trained regarding the use of all chemicals used in the water treatment plant. Training programs shall meet applicable standards established by the Occupational Safety and Health Administration (OSHA) or the Texas Hazard Communications Act, Texas Health and Safety Code, Title 6, Chapter 502.

(C) Public water systems using chlorine dioxide shall place the operation of the chlorine dioxide facilities under the direct supervision of a licensed operator who has a Class "C" or higher license.

(3) Systems that only purchase treated water shall meet the following requirements in addition to the requirements contained in paragraph (2) of this subsection.

(A) Purchased water systems serving no more than 250 connections must employ an operator who holds a Class "D" or higher license.

(B) Purchased water systems serving more than 250 connections, but no more than 1,000 connections, must employ an operator who holds a Class "C" or higher license.

(C) Purchased water systems serving more than 1,000 connections must employ at least two operators who hold a Class "C" or higher license and who each work at least 16 hours per month at the public water system's treatment or distribution facilities.

(4) Systems that treat groundwater and do not treat surface water or groundwater that is under the direct influence of surface water shall meet the following requirements in addition to the requirements contained in paragraph (2) of this subsection.

(A) Groundwater systems serving no more than 250 connections must employ an operator with a Class "D" or higher license.

(B) Groundwater systems serving more than 250 connections, but no more than 1,000 connections, must employ an operator with a Class "C" or higher groundwater license.

(C) Groundwater systems serving more than 1,000 connections must employ at least two operators who hold a Class "C" or higher groundwater license and who each work at least 16 hours per month at the public water system's production, treatment, or distribution facilities.

(5) Systems that treat groundwater that is under the direct influence of surface water must meet the following requirements in addition to the requirements contained in paragraph (2) of this subsection.

(A) Systems which serve no more than 1,000 connections and utilize cartridge or membrane filters must employ an operator who holds a Class "C" or higher groundwater license and has completed a four-hour training course on monitoring and reporting requirements or who holds a Class "C" or higher surface water license and has completed the Groundwater Production course.

(B) Systems which serve more than 1,000 connections and utilize cartridge or membrane filters must employ at least two operators who meet the requirements of subparagraph (A) of this paragraph and who each work at least 24 hours per month at the public water system's production, treatment, or distribution facilities.

(C) Systems which serve no more than 1,000 connections and utilize coagulant addition and direct filtration must employ an operator who holds a Class "C" or higher surface water license and has completed the Groundwater Production course or who holds a Class "C" or higher groundwater license and has completed a Surface Water Production course. Effective January 1, 2007, the public water system must employ at least one operator who has completed the Surface Water Unit I course and the Surface Water Unit II course.

(D) Systems which serve more than 1,000 connections and utilize coagulant addition and direct filtration must employ at least two operators who meet the requirements of subparagraph (C) of this paragraph and who each work at least 24 hours per month at the public water system's production, treatment, or distribution facilities. Effective January 1, 2007, the public water system must employ at least two operators who have completed the Surface Water Unit I course and the Surface Water Unit II course.

(E) Systems which utilize complete surface water treatment must comply with the requirements of paragraph (6) of this subsection.

(F) Each plant must have at least one Class "C" or higher operator on duty at the plant when it is in operation or the plant must be provided with continuous turbidity and disinfectant residual monitors with automatic plant shutdown and alarms to summon operators so as to ensure that the water produced continues to meet the commission's drinking water standards during periods when the plant is not staffed.

(6) Systems that treat surface water must meet the following requirements in addition to the requirements contained in paragraph (2) of this subsection.

(A) Surface water systems that serve no more than 1,000 connections must employ at least one operator who holds a Class "B" or higher surface water license. Part-time operators may be used to meet the requirements of this subparagraph if the operator is completely familiar with the design and operation of the plant and spends at least four consecutive hours at the plant at least once every 14 days and the system also employs an operator who holds a Class "C" or higher surface water license. Effective January 1, 2007, the public water system must employ at least one operator who has completed the Surface Water Unit I course and the Surface Water Unit II course.

(B) Surface water systems that serve more than 1,000 connections must employ at least two operators; one of the required operators must hold a Class "B" or higher surface water license

and the other required operator must hold a Class "C" or higher surface water license. Each of the required operators must work at least 32 hours per month at the public water system's production, treatment, or distribution facilities. Effective January 1, 2007, the public water system must employ at least two operators who have completed the Surface Water Unit I course and the Surface Water Unit II course.

(C) Each surface water treatment plant must have at least one Class "C" or higher surface water operator on duty at the plant when it is in operation or the plant must be provided with continuous turbidity and disinfectant residual monitors with automatic plant shutdown and alarms to summon operators so as to ensure that the water produced continues to meet the commission's drinking water standards during periods when the plant is not staffed.

(D) Public water systems shall not allow Class "D" operators to adjust or modify the treatment processes at surface water treatment plant unless an operator who holds a Class "C" or higher surface license is present at the plant and has issued specific instructions regarding the proposed adjustment.

(f) Operating records and reports. Water systems must maintain a record of water works operation and maintenance activities and submit periodic operating reports.

(1) The public water system's operating records must be organized, and copies must be kept on file or stored electronically.

(2) The public water system's operating records must be accessible for review during inspections.

(3) All public water systems shall maintain a record of operations.

(A) The following records shall be retained for at least two years:

(i) the amount of chemicals used:

(I) Systems that treat surface water or groundwater under the direct influence of surface water shall maintain a record of the amount of each chemical used each day.

(II) Systems that serve 250 or more connections or serve 750 or more people shall maintain a record of the amount of each chemical used each day.

(III) Systems that serve fewer than 250 connections, serve fewer than 750 people, and use only groundwater or purchased treated water shall maintain a record of the amount of each chemical used each week;

(ii) the volume of water treated:

(I) Systems that treat surface water or groundwater under the direct influence of surface water shall maintain a record of the amount of water treated each day.

(II) Systems that serve 250 or more connections or serve 750 or more people shall maintain a record of the amount of water treated each day.

(III) Systems that serve fewer than 250 connections, serve fewer than 750 people, and use only groundwater or purchase treated water shall maintain a record of the amount of water treated each week;

(iii) the date, location, and nature of water quality, pressure, or outage complaints received by the system and the results of any subsequent complaint investigation;

(iv) the dates that dead-end mains were flushed;

(v) the dates that storage tanks and other facilities were cleaned;

(vi) the maintenance records for water system equipment and facilities; and

(vii) for systems that do not employ full-time operators to meet the requirements of subsection (e) of this section, a daily record or a monthly summary of the work performed and the number of hours worked by each of the part-time operators used to meet the requirements of subsection (e) of this section.

(B) The following records shall be retained for at least three years:

(i) copies of notices of violation and any resulting corrective actions. The records of the actions taken to correct violations of primary drinking water regulations must be retained for at least three years after the last action taken with respect to the particular violation involved;

(ii) copies of any public notice issued by the water system;

(iii) the disinfectant residual monitoring results from the distribution system;

(iv) the turbidity monitoring results and exception reports for individual filters as required by §290.111 of this title (relating to Surface Water Treatment);

(v) the calibration records for laboratory equipment, flow meters, rate-of-flow controllers, on-line turbidimeters, and on-line disinfectant residual analyzers;

(vi) the records of backflow prevention device programs;

(vii) the raw surface water monitoring results must be retained for three years after bin classification required by §290.111 of this title;

(viii) notification to the executive director that a system will provide 5.5-log *Cryptosporidium* treatment in lieu of raw surface water monitoring; and

(ix) except for those specified in clause (iv) of this subparagraph and subparagraph (E)(i) of this paragraph, the results of all surface water treatment monitoring that are used to demonstrate log inactivation or removal.

(C) The following records shall be retained for a period of five years after they are no longer in effect:

(i) the records concerning a variance or exemption granted to the system;

(ii) Concentration Time (CT) studies for surface water treatment plants; and

(iii) the Recycling Practices Report form and other records pertaining to site-specific recycle practices for treatment plants that recycle.

(D) The following records shall be retained for at least five years:

(i) the results of microbiological analyses;

(ii) the results of inspections (as required in subsection (m)(1) of this section) for all water storage and pressure maintenance facilities;

(iii) the results of inspections as required by subsection (m)(2) of this section for all pressure filters;

(iv) documentation of compliance with state approved corrective action plan and schedules required to be completed by groundwater systems that must take corrective actions;

(v) documentation of the reason for an invalidated fecal indicator source sample;

(vi) notification to wholesale system(s) of a distribution coliform positive sample for consecutive systems using groundwater; and

(vii) Consumer Confidence Report compliance documentation.

(E) The following records shall be retained for at least ten years:

(i) copies of Monthly Operating Reports and any supporting documentation including turbidity monitoring results of the combined filter effluent;

(ii) the results of chemical analyses;

(iii) any written reports, summaries, or communications relating to sanitary surveys of the system conducted by the system itself, by a private consultant, or by the executive director shall be kept for a period not less than ten years after completion of the survey involved;

(iv) copies of the Customer Service Inspection reports required by subsection (j) of this section;

(v) copy of any Initial Distribution System Evaluation (IDSE) plan, report, approval letters, and other compliance documentation required by §290.115 of this title (relating to Stage 2 Disinfection By-products (TTHM and HAA5));

(vi) state notification of any modifications to an IDSE report;

(vii) copy of any 40/30 certification required by §290.115 of this title;

(viii) documentation of corrective actions taken by groundwater systems in accordance with §290.116 of this title; and

(ix) any monitoring plans required by §290.121(b) of this title (relating to Monitoring Plans).

(F) A public water system shall maintain records relating to special studies and pilot projects, special monitoring, and other system-specific matters as directed by the executive director.

(4) Water systems shall submit routine reports and any additional documentation that the executive director may require to determine compliance with the requirements of this chapter.

(A) The reports must be submitted to the Texas Commission on Environmental Quality, Water Supply Division, MC 155, P.O. Box 13087, Austin, Texas 78711-3087 by the tenth day of the month following the end of the reporting period.

(B) The reports must contain all the information required by the drinking water standards and the results of any special monitoring tests which have been required.

(C) The reports must be completed in ink, typed, or computer-printed and must be signed by the certified water works operator.

(g) Disinfection of new or repaired facilities. Disinfection by or under the direction of water system personnel must be performed when repairs are made to existing facilities and before new facilities are placed into service. Disinfection must be performed in accordance with American Water Works Association (AWWA) requirements and water samples must be submitted to a laboratory approved by the executive director. The sample results must indicate that the facility is free of microbiological contamination before it is placed into service. When it is necessary to return repaired mains to service as rapidly as possible, doses may be increased to 500 mg/L and the contact time reduced to 1/2 hour.

(h) Calcium hypochlorite. A supply of calcium hypochlorite disinfectant shall be kept on hand for use when making repairs, setting meters, and disinfecting new mains prior to placing them in service.

(i) Plumbing ordinance. Public water systems must adopt an adequate plumbing ordinance, regulations, or service agreement with provisions for proper enforcement to insure that neither cross-connections nor other unacceptable plumbing practices are permitted. See §290.47(b) of this title (relating to Appendices). Should sanitary control of the distribution system not reside with the purveyor, the entity retaining sanitary control shall be responsible for establishing and enforcing adequate regulations in this regard. The use of pipes and pipe fittings that contain more than 8.0% lead or solders and flux that contain more than 0.2% lead is prohibited for installation or repair of any public water supply and for installation or repair of any plumbing in a residential or nonresidential facility providing water for human consumption and connected to a public drinking water supply system. This requirement may be waived for lead joints that are necessary for repairs to cast iron pipe.

(j) Customer service inspections. A customer service inspection certificate shall be completed prior to providing continuous water service to new construction, on any existing service either when the water purveyor has reason to believe that cross-connections or other potential contaminant hazards exist, or after any material improvement, correction, or addition to the private water distribution facilities. Any customer service inspection certificate form which varies from the format found in §290.47(d) of this title (relating to Appendices) must be approved by the executive director prior to being placed in use.

(1) Individuals with the following credentials shall be recognized as capable of conducting a customer service inspection certification.

(A) Plumbing Inspectors and Water Supply Protection Specialists licensed by the Texas State Board of Plumbing Examiners (TSBPE).

(B) Customer service inspectors who have completed a commission-approved course, passed an examination administered by the executive director, and hold current professional license as a customer service inspector.

(2) As potential contaminant hazards are discovered, they shall be promptly eliminated to prevent possible contamination of the water supplied by the public water system. The existence of a health hazard, as identified in §290.47(i) of this title, shall be considered sufficient grounds for immediate termination of water service. Service can be restored only when the health hazard no longer exists, or until the health hazard has been isolated from the public water system in accordance with §290.44(h) of this title (relating to Water Distribution).

(3) These customer service inspection requirements are not considered acceptable substitutes for and shall not apply to the sanitary control requirements stated in §290.102(a)(5) of this title (relating to General Applicability).

(4) A customer service inspection is an examination of the private water distribution facilities for the purpose of providing or denying water service. This inspection is limited to the

identification and prevention of cross-connections, potential contaminant hazards, and illegal lead materials. The customer service inspector has no authority or obligation beyond the scope of the commission's regulations. A customer service inspection is not a plumbing inspection as defined and regulated by the TSBPE. A customer service inspector is not permitted to perform plumbing inspections. State statutes and TSBPE adopted rules require that TSBPE licensed plumbing inspectors perform plumbing inspections of all new plumbing and alterations or additions to existing plumbing within the municipal limits of all cities, towns, and villages which have passed an ordinance adopting one of the plumbing codes recognized by TSBPE. Such entities may stipulate that the customer service inspection be performed by the plumbing inspector as a part of the more comprehensive plumbing inspection. Where such entities permit customer service inspectors to perform customer service inspections, the customer service inspector shall report any violations immediately to the local entity's plumbing inspection department.

(k) Interconnection. No physical connection between the distribution system of a public drinking water supply and that of any other water supply shall be permitted unless the other water supply is of a safe, sanitary quality and the interconnection is approved by the executive director.

(l) Flushing of mains. All dead-end mains must be flushed at monthly intervals. Dead-end lines and other mains shall be flushed as needed if water quality complaints are received from water customers or if disinfectant residuals fall below acceptable levels as specified in §290.110 of this title (relating to Disinfectant Residuals).

(m) Maintenance and housekeeping. The maintenance and housekeeping practices used by a public water system shall ensure the good working condition and general appearance of the system's facilities and equipment. The grounds and facilities shall be maintained in a manner so as to minimize the possibility of the harboring of rodents, insects, and other disease vectors, and in such a way as to prevent other conditions that might cause the contamination of the water.

(1) Each of the system's ground, elevated, and pressure tanks shall be inspected annually by water system personnel or a contracted inspection service.

(A) Ground and elevated storage tank inspections must determine that the vents are in place and properly screened, the roof hatches closed and locked, flap valves and gasketing provide adequate protection against insects, rodents, and other vermin, the interior and exterior coating systems are continuing to provide adequate protection to all metal surfaces, and the tank remains in a watertight condition.

(B) Pressure tank inspections must determine that the pressure release device and pressure gauge are working properly, the air-water ratio is being maintained at the proper level, the exterior coating systems are continuing to provide adequate protection to all metal surfaces, and the tank remains in watertight condition. Pressure tanks provided with an inspection port must have the interior surface inspected every five years.

(C) All tanks shall be inspected annually to determine that instrumentation and controls are working properly.

(2) When pressure filters are used, a visual inspection of the filter media and internal filter surfaces shall be conducted annually to ensure that the filter media is in good condition and the coating materials continue to provide adequate protection to internal surfaces.

(3) When cartridge filters are used, filter cartridges shall be changed at the frequency required by the manufacturer, or more frequently if needed.

(4) All water treatment units, storage and pressure maintenance facilities, distribution system lines, and related appurtenances shall be maintained in a watertight condition and be free of excessive solids.

(5) Basins used for water clarification shall be maintained free of excessive solids to prevent possible carryover of sludge and the formation of tastes and odors.

(6) Pumps, motors, valves, and other mechanical devices shall be maintained in good working condition.

(n) Engineering plans and maps. Plans, specifications, maps, and other pertinent information shall be maintained to facilitate the operation and maintenance of the system's facilities and equipment. The following records shall be maintained on file at the public water system and be available to the executive director upon request.

(1) Accurate and up-to-date detailed as-built plans or record drawings and specifications for each treatment plant, pump station, and storage tank shall be maintained at the public water system until the facility is decommissioned. As-built plans of individual projects may be used to fulfill this requirement if the plans are maintained in an organized manner.

(2) An accurate and up-to-date map of the distribution system shall be available so that valves and mains can be easily located during emergencies.

(3) Copies of well completion data such as well material setting data, geological log, sealing information (pressure cementing and surface protection), disinfection information, microbiological sample results, and a chemical analysis report of a representative sample of water from the well shall be kept on file for as long as the well remains in service.

(o) Filter backwashing at surface water treatment plants. Filters must be backwashed when a loss of head differential of six to ten feet is experienced between the influent and effluent loss of head gauges or when the turbidity level at the effluent of the filter reaches 1.0 nephelometric turbidity unit (NTU).

(p) Data on water system ownership and management. The agency shall be provided with information regarding water system ownership and management.

(1) When a water system changes ownership, a written notice of the transaction must be provided to the executive director. When applicable, notification shall be in accordance with Chapter 291 of this title (relating to Utility Regulations). Those systems not subject to Chapter 291 of this title shall

notify the executive director of changes in ownership by providing the name of the current and prospective owner or responsible official, the proposed date of the transaction, and the address and phone number of the new owner or responsible official. The information listed in this paragraph and the system's public drinking water supply identification number, and any other information necessary to identify the transaction shall be provided to the executive director 120 days before the date of the transaction.

(2) On an annual basis, the owner of a public water system shall provide the executive director with a written list of all the operators and operating companies that the public water system employs. The notice shall contain the name, license number, and license class of each employed operator and the name and registration number of each employed operating company. See §290.47(g) of this title (relating to Appendices).

(q) Special precautions. Special precautions must be instituted by the water system owner or responsible official in the event of low distribution pressures (below 20 pounds per square inch (psi)), water outages, microbiological samples found to contain *E. coli* or fecal coliform organisms, failure to maintain adequate chlorine residuals, elevated finished water turbidity levels, or other conditions which indicate that the potability of the drinking water supply has been compromised.

(1) Boil water notifications must be issued to the customers within 24 hours using the prescribed notification format as specified in §290.47(e) of this title (relating to Appendices). A copy of this notice shall be provided to the executive director. Bilingual notification may be appropriate based upon local demographics. Once the boil water notification is no longer in effect, the customers must be notified in a manner similar to the original notice.

(2) The flowchart found in §290.47(h) of this title shall be used to determine if a boil water notification must be issued in the event of a loss of distribution system pressure. If a boil water notice is issued under this section, it shall remain in effect until water distribution pressures in excess of 20 psi can consistently be maintained, a minimum of 0.2 mg/L free chlorine residual or 0.5 mg/L chloramine residual (measured as total chlorine) is present throughout the system, and water samples collected for microbiological analysis are found negative for coliform organisms.

(3) A boil water notification shall be issued if the turbidity of the finished water produced by a surface water treatment plant exceeds 5.0 NTU. The boil water notice shall remain in effect until the water entering the distribution system has a turbidity level below 1.0 NTU, the distribution system has been thoroughly flushed, a minimum of 0.2 mg/L free chlorine residual or 0.5 mg/L chloramine residual (measured as total chlorine) is present throughout the system, and water samples collected for microbiological analysis are found negative for coliform organisms.

(4) Other protective measures may be required at the discretion of the executive director.

(r) Minimum pressures. All public water systems shall be operated to provide a minimum pressure of 35 psi throughout the distribution system under normal operating conditions. The system shall also be operated to maintain a minimum pressure of 20 psi during emergencies such as fire fighting.

(s) Testing equipment. Accurate testing equipment or some other means of monitoring the effectiveness of any chemical treatment or pathogen inactivation or removal processes must be used by the system.

(1) Flow measuring devices and rate-of-flow controllers that are required by §290.42(d) of this title shall be calibrated at least once every 12 months. Well meters required by §290.41(c)(3)(N) of this title shall be calibrated at least once every three years.

(2) Laboratory equipment used for compliance testing shall be properly calibrated.

(A) pH meters shall be properly calibrated.

(i) Benchtop pH meters shall be calibrated according to manufacturers specifications at least once each day.

(ii) The calibration of benchtop pH meters shall be checked with at least one buffer each time a series of samples is run, and if necessary, recalibrated according to manufacturers specifications.

(iii) On-line pH meters shall be calibrated according to manufacturer specifications at least once every 30 days.

(iv) The calibration of on-line pH meters shall be checked at least once each week with a primary standard or by comparing the results from the on-line unit with the results from a properly calibrated benchtop unit. If necessary, the on-line unit shall be recalibrated with primary standards.

(B) Turbidimeters shall be properly calibrated.

(i) Benchtop turbidimeters shall be calibrated with primary standards at least once every 90 days. Each time the turbidimeter is calibrated with primary standards, the secondary standards shall be restandardized.

(ii) The calibration of benchtop turbidimeters shall be checked with secondary standards each time a series of samples is tested, and if necessary, recalibrated with primary standards.

(iii) On-line turbidimeters shall be calibrated with primary standards at least once every 90 days.

(iv) The calibration of on-line turbidimeters shall be checked at least once each week with a primary standard, a secondary standard, or the manufacturer's proprietary calibration confirmation device or by comparing the results from the on-line unit with the results from a properly calibrated benchtop unit. If necessary, the on-line unit shall be recalibrated with primary standards.

(C) Chemical disinfectant residual analyzers shall be properly calibrated.

(i) The accuracy of manual disinfectant residual analyzers shall be verified at least once every 30 days using chlorine solutions of known concentrations.

(ii) Continuous disinfectant residual analyzers shall be calibrated at least once every 90 days using chlorine solutions of known concentrations.

(iii) The calibration of continuous disinfectant residual analyzers shall be checked at least once each month with a chlorine solution of known concentration or by comparing the results from the on-line analyzer with the result of approved benchtop amperometric, spectrophotometric, or titration method.

(D) Ultraviolet (UV) light disinfection analyzers shall be properly calibrated.

(i) The accuracy of duty UV sensors shall be verified with a reference UV sensor monthly, according to the UV sensor manufacturer.

(ii) The reference UV sensor shall be calibrated by the UV sensor manufacturer on a yearly basis, or sooner if needed.

(iii) If used, the Ultraviolet Transmittance (UVT) analyzer shall be calibrated weekly according to the UVT analyzer manufacturer specifications.

(E) Systems must verify the performance of direct integrity testing equipment in a manner and schedule approved by the executive director.

(t) System ownership. All community water systems shall post a legible sign at each of its production, treatment, and storage facilities. The sign shall be located in plain view of the public and shall provide the name of the water supply and an emergency telephone number where a responsible official can be contacted.

(u) Abandoned wells. Abandoned public water supply wells owned by the system must be plugged with cement according to 16 Texas Administrative Code (TAC) Chapter 76 (relating to Water Well Drillers and Water Well Pump Installers). Wells that are not in use and are non-deteriorated as defined in those rules must be tested every five years or as required by the executive director to prove that they are in a non-deteriorated condition. The test results shall be sent to the executive director for review and approval. Deteriorated wells must be either plugged with cement or repaired to a non-deteriorated condition.

(v) Electrical wiring. All water system electrical wiring must be securely installed in compliance with a local or national electrical code.

(w) Security. All systems shall maintain internal procedures to notify the executive director by a toll-free reporting phone number immediately of the following events, if the event may negatively impact the production or delivery of safe and adequate drinking water:

(1) an unusual or unexplained unauthorized entry at property of the public water system;

(2) an act of terrorism against the public water system;

(3) an unauthorized attempt to probe for or gain access to proprietary information that supports the key activities of the public water system;

(4) a theft of property that supports the key activities of the public water system; or

(5) a natural disaster, accident, or act that results in damage to the public water system.

§290.47. Appendices.

(a) Appendix A. Recognition as a Superior or Approved Public Water System.

Figure: 30 TAC §290.47(a)

APPENDIX A

Requirements. Public water supply systems which achieve and maintain recognition must exceed the minimum acceptable standards of the commission in these sections.

(1) To attain recognition as a "Superior Public Water System", the following additional requirements must be met:

(A) Physical facilities shall comply with the requirements in these sections.

(B) There shall be a minimum of two certified operators with additional operators required for larger systems.

(C) The system's microbiological record for the previous 24 months period shall indicate no violations (frequency, number or MCL) of the drinking water standards.

(D) The quality of the water shall comply with all primary water quality parameters listed in the drinking water standards.

(E) The chemical quality of the water shall comply with all secondary constituent levels listed in the drinking water standards.

(F) The system's operation shall comply with applicable state statutes and minimum acceptable operating practices set forth in §290.46 of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Supplies).

(G) The system's capacities shall meet or exceed minimum water system capacity requirements set forth in §290.45 of this title (relating to Minimum Water System Capacity Requirements).

(H) The system shall have at least two wells, two raw water pumps or a combination of these with enough capacity to provide average daily consumption with the largest well or pump out of service. This requirement shall also apply to treatment plant pumps necessary for operation in accordance with §290.42 of this title (relating to Water Treatment).

(I) The water system shall be well maintained and the facilities shall present a pleasing appearance to the public.

(2) To attain recognition as an "Approved Public Water System," all additional requirements listed under subsection (a)(1) of this section with exception of secondary constituents, subsection (a)(1)(E) of this section must be met. Public water systems which provide water quality that exceeds the secondary chemical standards may be excluded from this recognition program at the discretion of the executive director.

Signs. Systems which have met the requirements for recognition as a superior or approved system may erect signs denoting this honor.

Inspections. To receive or maintain recognition as a superior or approved water system, the system must be inspected and evaluated by commission personnel as to physical facilities, appearance and operation. Systems which fail to meet the above requirements in this section will be denied recognition or will have their recognition revoked. The signs shall be immediately removed on notice from the executive director.

(b) Appendix B. Sample Service Agreement.

Figure: 30 TAC §290.47(b)

SERVICE AGREEMENT

I. PURPOSE. The NAME OF WATER SYSTEM is responsible for protecting the drinking water supply from contamination or pollution which could result from improper private water distribution system construction or configuration. The purpose of this service agreement is to notify each customer of the restrictions which are in place to provide this protection. The utility enforces these restrictions to ensure the public health and welfare. Each customer must sign this agreement before the NAME OF WATER SYSTEM will begin service. In addition, when service to an existing connection has been suspended or terminated, the water system will not re-establish service unless it has a signed copy of this agreement.

II. RESTRICTIONS. The following unacceptable practices are prohibited by State regulations.

A. No direct connection between the public drinking water supply and a potential source of contamination is permitted. Potential sources of contamination shall be isolated from the public water system by an air-gap or an appropriate backflow prevention device.

B. No cross-connection between the public drinking water supply and a private water system is permitted. These potential threats to the public drinking water supply shall be eliminated at the service connection by the installation of an air-gap or a reduced pressure-zone backflow prevention device.

C. No connection which allows water to be returned to the public drinking water supply is permitted.

D. No pipe or pipe fitting which contains more than 8.0% lead may be used for the installation or repair of plumbing at any connection which provides water for human use.

E. No solder or flux which contains more than 0.2 percent lead can be used for the installation or repair of plumbing at any connection which provides water for human use.

III. SERVICE AGREEMENT. The following are the terms of the service agreement between the NAME OF WATER SYSTEM (the Water System) and NAME OF CUSTOMER (the Customer).

A. The Water System will maintain a copy of this agreement as long as the Customer and/or the premises is connected to the Water System.

B. The Customer shall allow his property to be inspected for possible cross-connections and other potential contamination hazards. These inspections shall be conducted by the Water System or its designated agent prior to initiating new water service; when there is reason to believe that cross-connections or other potential contamination hazards exist; or after any major changes to the private water distribution facilities. The inspections shall be conducted during the Water System's normal business hours.

C. The Water System shall notify the Customer in writing of any cross-connection or other potential contamination hazard which has been identified during the initial inspection or the periodic reinspection.

D. The Customer shall immediately remove or adequately isolate any potential cross-connections or other potential contamination hazards on his premises.

E. The Customer shall, at his expense, properly install, test, and maintain any backflow prevention device required by the Water System. Copies of all testing and maintenance records shall be provided to the Water System.

IV. ENFORCEMENT. If the Customer fails to comply with the terms of the Service Agreement, the Water System shall, at its option, either terminate service or properly install, test, and maintain an appropriate backflow prevention device at the service connection. Any expenses associated with the enforcement of this agreement shall be billed to the Customer.

CUSTOMER'S SIGNATURE:_____

DATE:_____

(c) Appendix C. Sample Sanitary Control Easement Document for a Public Water Well.

Figure: 30 TAC §290.47(c)

SANITARY CONTROL EASEMENT

DATE: _____, 2____

GRANTOR(S):
GRANTOR'S ADDRESS:
GRANTEE:
GRANTEE'S ADDRESS:
SANITARY CONTROL EASEMENT:

Purpose, Restrictions, and Uses of Easement:

1. The purpose of this easement is to protect the water supply of the well described and located below by means of sanitary control.

2. The construction and operation of underground petroleum and chemical storage

tanks and liquid transmission pipelines, stock pens, feedlots, dump grounds, privies, cesspools, septic tank or sewage treatment drainfields, improperly constructed water wells of any depth, and all other construction or operation that could create an unsanitary condition within, upon, or across the property subject to this easement are prohibited within this easement. For the purpose of the easement, improperly constructed water wells are those wells which do not meet the surface and subsurface construction standards for a public water supply well.

3. The construction of tile or concrete sanitary sewers, sewer appurtenances, septic tanks, storm sewers, and cemeteries is specifically prohibited within a 50-foot radius of the water well described and located below.

4. This easement permits the construction of homes or buildings upon the Grantor's property as long as all items in Restrictions Nos. 2 and 3 are recognized and followed.

5. This easement permits normal farming and ranching operations, except that livestock shall not be allowed within 50 feet of the water well.

The Grantor's property subject to this Easement is described in the documents recorded at:

Volume ___, Pages ___ of the Real Property Records of _____ County, Texas.

Property Subject to Easement:

All of that area within a 150 foot radius of the water well located ___ feet at a radial of ___ degrees from the ___ corner of Lot ___, of a Subdivision of Record in Book ___, Page ___ of the County Plat Records, _____ County, Texas.

TERM:

This easement shall run with the land and shall be binding on all parties and persons claiming under the Grantor(s) for a period of two years from the date that this easement is recorded; after which time, this easement shall be automatically extended until the use of the subject water well as a source of water for public water systems ceases.

ENFORCEMENT:

Enforcement of this easement shall be proceedings at law or in equity against any person or persons violating or attempting to violate the restrictions in this easement, either to restrain the violation or to recover damages.

INVALIDATION:

Invalidation of any one of these restrictions or uses (covenants) by a judgement or court order shall not affect any of the other provisions of this easement, which shall remain in full force and effect.

FOR AND IN CONSIDERATION, of the sum of One Dollar ($1.00) and for other good and valuable consideration paid by the Grantee to the Grantor(s), the receipt of which is hereby acknowledged, the Grantor does hereby grant and convey to Grantee and to its successors and assigns the sanitary control easement described in this easement.

GRANTOR(S)

By:

ACKNOWLEDGMENT

STATE OF TEXAS §
§
COUNTY OF §

BEFORE ME, the undersigned authority, on the day of _____, 2____, personally appeared _____ known to me to be the person(s) whose name(s) is(are) subscribed to the foregoing instrument and acknowledged to me that executed the same for the purposes and consideration therein expressed.

Notary Public in and for
THE STATE OF TEXAS
My Commission Expires:

Typed or Printed Name of Notary

Recorded in _____ Courthouse, _____ Texas on _____, 2____

(d) Appendix D. Customer Service Inspection Certification.

Figure: 30 TAC §290.47(d)

Appendix D: Customer Service Inspection Certificate

Customer Service Inspection Certificate

Name of PWS _____PWS I.D.# _____
Location of Service _____

Reason for Inspection: New construction..... ☐
Existing service where contaminant hazards are suspected ..... ☐
Major renovation or expansion of distribution facilities ..... ☐

I _____, upon inspection of the private water distribution facilities connected to the aforementioned public water supply do hereby certify that, to the best of my knowledge:

	Compliance	Non-Compliance
(1) No direct connection between the public drinking water supply and a potential source of contamination exists. Potential sources of contamination are isolated from the public water system by an air gap or an appropriate backflow prevention assembly in accordance with Commission regulations.	☐	☐
(2) No cross-connection between the public drinking water supply and a private water system exists. Where an actual air gap is not maintained between the public water supply and a private water supply, an approved reduced pressure-zone backflow prevention assembly is properly installed and a service agreement exists for annual inspection and testing by a certified backflow prevention assembly tester.	☐	☐
(3) No connection exists which would allow the return of water used for condensing, cooling or industrial processes back to the public water supply.	☐	☐
(4) No pipe or pipe fitting which contains more than 8.0% lead exists in private water distribution facilities installed on or after July 1, 1988.	☐	☐
(5) No solder or flux which contains more than 0.2% lead exists in private water distribution facilities installed on or after July 1, 1988.	☐	☐

I further certify that the following materials were used in the installation of the private water distribution facilities:

Service lines Lead ☐ Copper ☐ PVC ☐ Other ☐

Solder Lead ☐ Lead Free ☐ Solvent Weld ☐ Other ☐

(e) Appendix E. Boil Water Notification.

Figure: 30 TAC §290.47(e)

BOIL WATER NOTIFICATION

Due to conditions which have occurred recently in the water system, the Texas Commission on Environmental Quality has required the system to notify all customers to boil their water prior to consumption.

To ensure destruction of all harmful bacteria and other microbes, water for drinking, cooking, and ice making should be boiled and cooled prior to consumption. The water should be brought to a vigorous rolling boil and then boiled for two minutes. In lieu of boiling, you may purchase bottled water or obtain water from some other suitable source. When it is no longer necessary to boil the water, water system officials will notify you.

If you have questions regarding this matter you may contact (a) _____ at (b) _____.

(a) Utility Official(s) (b) Phone Number(s)

INSTRUCTIONS:

List more than one utility official and phone number. Do not list the commission as the primary contact. If a customer wishes to call the commission, please have them call (512) 239-4691.

(f) Appendix F. Sample Backflow Prevention Assembly Test and Maintenance Report.

Figure: 30 TAC §290.47(f)

The following form must be completed for each assembly tested. A signed and dated original must be submitted to the public water supplier for recordkeeping purposes:

BACKFLOW PREVENTION ASSEMBLY TEST AND MAINTENANCE REPORT

NAME OF PWS: _____
PWS I.D.: #_____
MAILING ADDRESS: _____
CONTACT PERSON: _____
LOCATION OF SERVICE: _____

The backflow prevention assembly detailed below has been tested and maintained as required by commission regulations and is certified to be operating within acceptable parameters.

TYPE OF ASSEMBLY

☐ Reduced Pressure Principle ☐ Reduced Pressure Principle-Detector
☐ Double Check Valve ☐ Double Check-Detector
☐ Pressure Vacuum Breaker ☐ Spill-Resistant Pressure Vacuum Breaker

Manufacturer_____ Size _____
Model Number_____ Located At _____
Serial Number_____

Is the assembly installed in accordance with manufacturer recommendations and/or local codes?_____

	Reduced Pressure Principle Assembly			Pressure Vacuum Breaker	
	Double Check Valve Assembly			Air Inlet	Check Valve
	1st Check	2nd Check	Relief Valve		
Initial Test	Held at ____ psid Closed Tight ☐ Leaked ☐	Held at ____ psid Closed Tight ☐ Leaked ☐	Opened at ___ psid Did not open ☐	Opened at ____ psid Did not open ☐	Held at _____ psid Leaked ☐
Repairs and Materials Used					
Test After Repair	Held at ____ psid Closed Tight ☐	Held at ____ psid Closed Tight ☐	Opened at ___ psid	Opened at ____ psid	Held at _____ psid

Test gauge used: Make/Model_____ SN:_____ Date Tested for Accuracy:_____
Remarks:_____
The above is certified to be true at the time of testing.
Firm Name _____ Certified Tester (print)_____
Firm Address _____ Certified Tester (signature)_____
Firm Phone #_____ Cert. Tester No. _____ Date_____

* TEST RECORDS MUST BE KEPT FOR AT LEAST THREE YEARS
** USE ONLY MANUFACTURER'S REPLACEMENT PARTS

(g) Appendix G. Operator and/or Employment Notice.

Figure: 30 TAC §290.47(g)

Section 290.46(p)(2), Data on water system ownership and management, requires the owner of a public water system to annually provide the executive director with a list of all the water works operators and operating companies that the public water system employs. The following form may be used to facilitate compliance with this requirement. This notice should be submitted to the Texas Commission on Environmental Quality, Water Supply Division, MC-155, P.O. Box 13087, Austin, Texas 78711-3087 or provided to the executive director during on-site inspections.

Operator and/or Employment Notice Form

Name of Operator or Operating Company	For Operators		For Companies
	License No.	Class of License	Registration No.
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

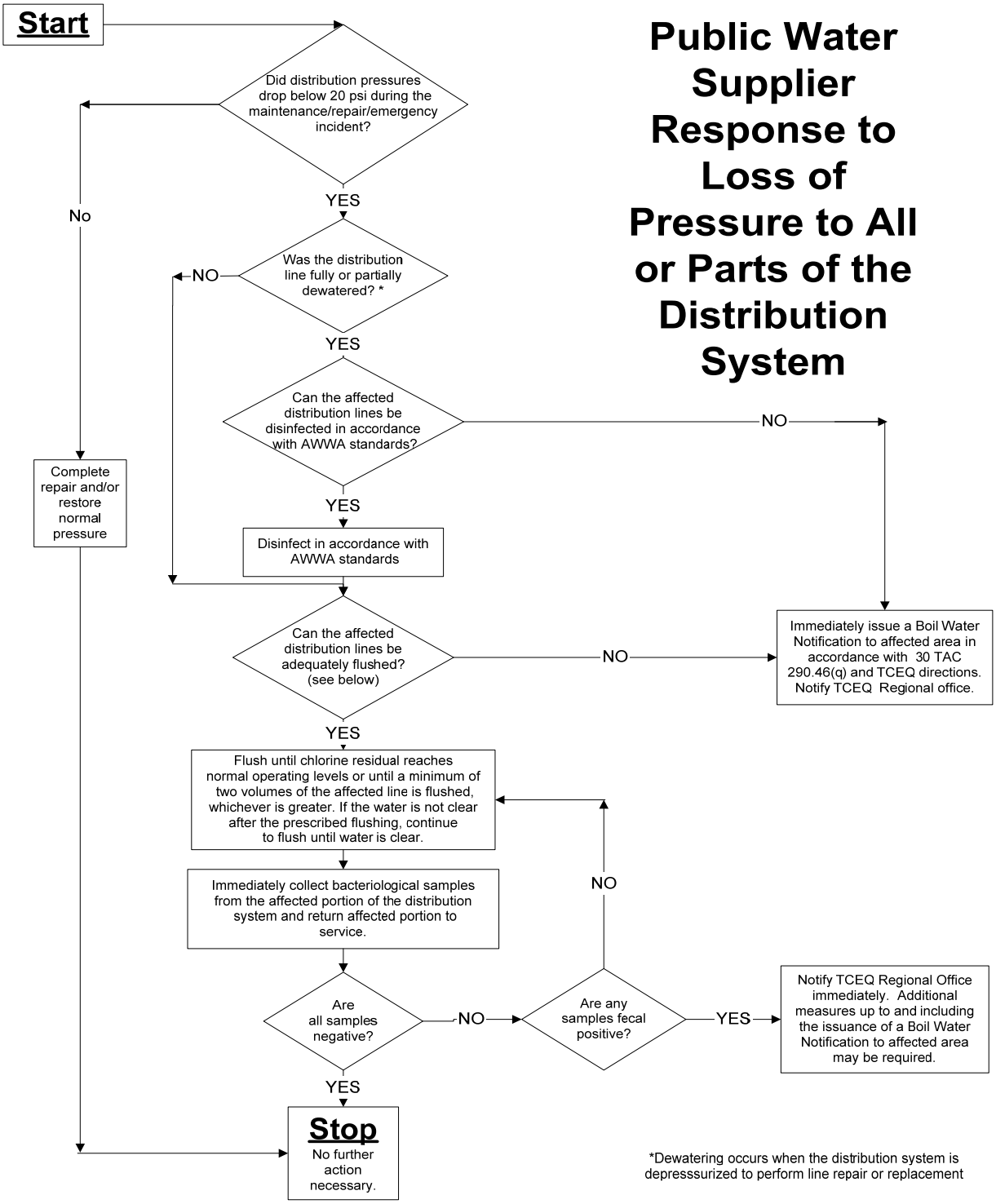
Signature of Water System Owner or Responsible Official _____ Date _____

Name of Water System Owner or Responsible Official _____ Title of Owner or Responsible Official _____

(h) Appendix H. Special Precautions.

Figure: 30 TAC §290.47(h)

Figure: 30 TAC §290.47(h)



(i) Appendix I. Assessment of Hazard and Selection of Assemblies.

Figure: 30 TAC §290.47(i)

Appendix I: Assessment of Hazards and Selection of Assemblies

The following table lists many common hazards. It is not an all-inclusive list of the hazards which may be found connected to public water systems.

Premises Isolation - Description of Premises	Assessment of Hazard	Required Assembly
Aircraft and missile plants	Health	RPBA or AG
Animal feedlots	Health	RPBA or AG
Automotive plants	Health	RPBA or AG
Breweries	Health	RPBA or AG
Canneries, packing houses and rendering plants	Health	RPBA or AG
Commercial car wash facilities	Health	RPBA or AG
Commercial laundries	Health	RPBA or AG
Cold storage facilities	Health	RPBA or AG
Connection to sewer pipe	Health	RPBA or AG
Dairies	Health	RPBA or AG
Docks and dockside facilities	Health	RPBA or AG
Dye works	Health	RPBA or AG
Food and beverage processing plants	Health	RPBA or AG
Hospitals, morgues, mortuaries, medical clinics, dental clinics, veterinary clinics, autopsy facilities, sanitariums, and medical labs	Health	RPBA or AG
Metal manufacturing, cleaning, processing, and fabrication plants	Health	RPBA or AG
Microchip fabrication facilities	Health	RPBA or AG
Paper and paper products plants	Health	RPBA or AG

Petroleum processing or storage facilities	Health	RPBA or AG
Photo and film processing labs	Health	RPBA or AG
Plants using radioactive material	Health	RPBA or AG
Plating or chemical plants	Health	RPBA or AG
Pleasure-boat marinas	Health	RPBA or AG
Private/Individual/Unmonitored Wells	Health	RPBA or AG
Reclaimed water systems	Health	RPBA or AG
Restricted, classified or other closed facilities	Health	RPBA or AG
Rubber plants	Health	RPBA or AG
Sewage lift stations	Health	RPBA or AG
Sewage treatment plants	Health	RPBA or AG
Slaughter houses	Health	RPBA or AG
Steam plants	Health	RPBA or AG
Tall buildings or elevation differences where the highest outlet is 80 feet or more above the meter	Nonhealth	DCVA
Internal Protection - Description of Cross Connection	**Assessment of Hazard**	**Required Assembly**
Aspirators	Nonhealth†	AVB
Aspirator (medical)	Health	AVB or PVB
Autoclaves	Health	RPBA
Autopsy and mortuary equipment	Health	AVB or PVB
Bedpan washers	Health	AVB or PVB
Connection to industrial fluid systems	Health	RPBA
Connection to plating tanks	Health	RPBA
Connection to salt-water cooling systems	Health	RPBA
Connection to sewer pipe	Health	AG
Cooling towers with chemical additives	Health	AG

Cuspidors	Health	AVB or PVB
Degreasing equipment	Nonhealth†	DCVA
Domestic space-heating boiler	Nonhealth†	RPBA
Dye vats or machines	Health	RPBA
Fire-fighting system (toxic liquid foam concentrates)	Health	RPBA
Flexible shower heads	Nonhealth†	AVB or PVB
Heating equipment Commercial Domestic	 Nonhealth† Nonhealth†	 RPBA DCVA
Hose bibs	Nonhealth†	AVB
Irrigation systems with chemical additives without chemical additives	 Health Nonhealth†	 RPBA DCVA, AVB, or PVB
Kitchen equipment - Commercial	Nonhealth†	AVB
Lab bench equipment	Health or Nonhealth†	AVB or PVB
Ornamental fountains	Health	AVB or PVB
Swimming pools Private Public	 Nonhealth† Nonhealth†	 PVB or AG RPBA or AG
Sewage pump	Health	AG
Sewage ejectors	Health	AG
Shampoo basins	Nonhealth†	AVB
Specimen tanks	Health	AVB or PVB
Steam generators	Nonhealth†	RPBA
Steam tables	Nonhealth†	AVB
Sterilizers	Health	RPBA
Tank vats or other vessels containing toxic substances	Health	RPBA

Trap primers	Health	AG
Vending machines	Nonhealth†	RPBA or PVB
Watering troughs	Health	AG or PVB

NOTE: AG = air gap; AVB = atmospheric vacuum breaker; DCVA = double check valve backflow prevention assembly; PVB = pressure vacuum breaker; RPBA = reduced-pressure principle backflow prevention assembly.

*AVBs and PVBs may be used to isolate health hazards under certain conditions, that is, backsiphonage situations. Additional area of premises isolation may be required.

†Where a greater hazard exists (due to toxicity or other potential health impact) additional area protection with RPBAs is required.

SUBCHAPTER F: DRINKING WATER STANDARDS GOVERNING

DRINKING WATER QUALITY AND REPORTING REQUIREMENTS

FOR PUBLIC WATER SYSTEMS

§290.101, 290.102, 290.103, 290.104, 290.106, 290.107, 290.108, 290.109, 290.110, 290.111, 290.112, 290.113, 290.114, 290.115, 290.116, 290.117, 290.118, 290.119, 290.121, 290.122

STATUTORY AUTHORITY

These amendments and new sections are adopted under Texas Water Code (TWC), §5.102, which establishes the commission's general authority necessary to carry out its jurisdiction; §5.103, which establishes the commission's general authority to adopt rules; §5.105, which establishes the commission's authority to set policy by rule; and Texas Health and Safety Code (THSC), §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 United States Code, §§300f to 300j-26; and THSC, §341.0315, which requires public water systems to comply with commission rules adopted to ensure the supply of safe drinking water.

The adopted amendments and new sections implement TWC, §5.102, §5.103, §5.105, THSC, §341.031, and §341.0315.

§290.101. Purpose.

The purpose of these standards is to assure the safety of public water supplies with respect to microbiological, chemical and radiological quality and to further efficient processing through control tests, laboratory checks, operating records and reports of public water supply systems. These standards are written to comply with the requirements of the Federal "Safe Drinking Water Act," 42 USC §300f *et*

seq., and the "Primary Drinking Water Regulations" which have been promulgated by the United States Environmental Protection Agency.

§290.102. General Applicability.

(a) General applicability. This subchapter shall apply to all public water systems as described in each section, unless the system:

(1) consists only of distribution and storage facilities (and does not have any production and treatment facilities);

(2) obtains all of its water from, but is not owned or operated by, a public water system to which such standards apply;

(3) does not sell water to any person;

(4) is not a carrier which conveys passengers in interstate commerce; and

(5) is subject to plumbing restrictions and inspections by the public water system which provides the water.

(b) Variances and exemptions. Variances and exemptions may be granted at the discretion of the executive director according to the Safe Drinking Water Act (SDWA), 42 United States Code (USC), §300g-4 and §300g-5, and according to National Primary Drinking Water Regulations, Subpart K, 40 Code of Federal Regulations (CFR) §§142.301 - 142.313. The executive director may not approve variances or exemptions from:

(1) the maximum contaminant level (MCL) for total coliforms, nitrate, nitrite, or total nitrate and nitrite;

(2) the maximum residual disinfection level (MRDL) for chlorine dioxide; or

(3) the treatment technique requirements for filtration and disinfection.

(c) Extensions. An extension to the compliance deadline for an MCL or treatment technique that becomes effective on or after January 1, 2002, may be granted at the discretion of the executive director in accordance with the SDWA, 42 USC, §300g-1(b)(10).

(1) The executive director may extend the effective date of an MCL or treatment technique for up to two years if all of the following conditions apply:

(A) there are no acute violations associated with the new MCL or treatment technique for which the extension is being granted;

(B) the executive director determines that granting the extension will not result in an unreasonable risk to public health;

(C) the extension is granted only to public water systems that were in operation on the date that the MCL or treatment technique was promulgated by the United States Environmental Protection Agency (EPA);

(D) the executive director determines that capital improvements are needed to comply with the new MCL or treatment technique;

(E) the executive director approves a schedule identifying the capital improvements necessary to bring the system into compliance with the new MCL or treatment technique; and

(F) the EPA has not already incorporated a two-year extension into the effective date for the new MCL or treatment technique requirement.

(2) An application for an extension must be submitted to the executive director in writing by the owner or responsible party of the water system. The request must include a statement identifying the new MCL or treatment technique which is not being met and a general long range plan for meeting the new requirement.

(3) The executive director may issue an extension covering a group or class of systems with a common MCL or treatment technique which is not met without individual applications.

(d) Motion to overturn. Any person may file a motion to overturn the executive director's decision to grant or deny a variance, exemption, or extension under this section according to the procedures set out in §50.139 of this title (relating to Motion to Overturn Executive Director's Decision).

(e) Monitoring schedule. All monitoring required by this chapter shall be conducted in a manner and on a schedule approved by the executive director in concurrence with the requirements of the administrator of the EPA.

(f) Modified monitoring. When a public water system supplies water to one or more other public water systems, the executive director may modify the monitoring requirements imposed by this chapter to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes. Any modified monitoring shall be conducted pursuant to a schedule specified by the executive director in concurrence with the requirements of the administrator of the EPA.

§290.103. Definitions.

The following definitions shall apply in the interpretation and enforcement of this subchapter. If a word or term used in this subchapter is not contained in the following list, its definition shall be as shown in §290.38 of this title (relating to Definitions) or in Title 40 Code of Federal Regulations (CFR) §141.2. Other technical terms used shall have the meanings or definitions listed in the latest edition of "Glossary,

Water and Wastewater Control Engineering," prepared by a joint editorial board representing the American Public Health Association, American Society of Civil Engineers, American Water Works Association, and the Water Pollution Control Federation.

(1) **Assessment source monitoring**--Raw groundwater source monitoring required by the executive director based on groundwater source susceptibility to fecal contaminants.

(2) **Combined distribution system (CDS)**--The interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive systems that receive finished water.

(A) The executive director may determine that the CDS does not include certain systems based on factors such as providing or receiving a relatively small amount of water or only on an emergency basis.

(B) A public water system may be determined to be in a different CDS for the purposes of compliance with regulations based on the Stage 2 Disinfection Byproducts Rule (DBP2) and the Long Term Stage 2 Enhanced Surface Water Treatment Rule (LT2).

(i) For the purposes of raw water monitoring under LT2, the CDS shall be based on the retail and wholesale population served by each surface water treatment plant or plant treating groundwater under the direct influence of surface water.

(ii) For the purposes of DBP2, the CDS shall be determined based on the retail population served within each individual system's distribution system.

(3) **Compliance cycle**--The nine-year (calendar year) cycle during which public water systems must monitor. Each compliance cycle consists of three, three-year compliance periods. The first compliance cycle begins January 1, 1993, and ends December 31, 2001. The second begins January 1, 2002, and ends December 31, 2010. The third begins January 1, 2011, and ends December 31, 2019. The cycle continues thereafter in a similar pattern.

(4) **Compliance period**--A three-year (calendar year) period within a compliance cycle. Each compliance cycle has three, three-year compliance periods. Within the first compliance cycle, the first compliance period is called the initial compliance period and runs from January 1, 1993, to December 31, 1995. The second period from January 1, 1996, to December 31, 1998. The third period from January 1, 1999, to December 31, 2001. Compliance periods in subsequent compliance cycles follow the same pattern.

(5) **Comprehensive performance evaluation (CPE)**--A thorough review and analysis of a treatment plant's performance-based capabilities and the associated administrative, operation and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant's capability to achieve compliance and to emphasize approaches that can be implemented without significant capital improvements. The comprehensive performance evaluation consists of the following components: assessment of plant performance; evaluation of major unit processes; identification and

prioritization of performance limiting factors; assessment of the applicability of comprehensive technical assistance; and preparation of a CPE report.

(6) **Consecutive system**--A public water system that receives some or all of its finished water from one or more other public water systems.

(7) **Disinfection profile**--A summary of daily *Cryptosporidium*, *Giardia lamblia* and viral inactivation obtained through disinfection at the treatment plant.

(8) **Disinfection by-products (DBP)**--Chemical compounds formed by the reaction of a disinfectant with the natural organic matter present in water.

(9) **DPD**--Abbreviation for N,N-diethyl-p-phenylenediamine, a reagent used in the determination of several residuals. DPD methods are available for both volumetric (titration) and colorimetric determinations, and are commonly used in the field as part of a colorimetric test kit.

(10) **Dual sample set**--A set of two samples collected at the same time and same location, with one sample analyzed for total trihalomethanes (TTHM) and the other sample analyzed for haloacetic acids-group of five (HAA5). Dual sample sets are collected for the purposes of conducting an initial distribution system evaluation and determining compliance with the TTHM and HAA5 maximum contaminant levels.

(11) **Enhanced coagulation**--The removal of disinfection by-product precursors to a specified level by conventional coagulation and sedimentation.

(12) **Enhanced softening**--The removal of disinfection by-product precursors to a specified level by softening.

(13) **Entry point**--Any point where a source of treated water first enters the distribution system. Entry points to the distribution system may include points where chlorinated well water, treated surface water, rechlorinated water from storage, or water purchased from another supplier enters the distribution system.

(14) **Entry point sampling site**--A sampling site representing the quality of the water entering the distribution system at each designated entry point.

(15) **Fecal indicators**--Microbiological organisms used to indicate the presence of fecal contamination. Examples include; fecal coliform, *E. coli*, enterococci, and coliphage.

(16) **Filter assessment**--An in-depth evaluation of an individual filter, including the analysis of historical filtered water turbidity from the filter, development of a filter profile, evaluation of media condition, identification and prioritization of factors limiting filter performance, appraisal of the applicability of corrections, and preparation of a filter self-assessment report.

(17) **Filter profile**--A graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run. The filter profile must include all the data collected from the time that the filter placed into service until the time that the backwash cycle is complete and the filter is restarted. The filter profile must also include data collected as another filter is being backwashed.

(18) **Finished water**--Water that is introduced into the distribution system of a public water system and intended for distribution and consumption without further treatment, except as necessary to maintain water quality within the distribution system (e.g., booster disinfection, addition of corrosion control chemicals).

(19) **Groundwater corrective action**--Action required when a raw groundwater source sample is found to be positive for *E. coli* or other fecal indicators as described under §290.116(b) of this title (relating to Groundwater Corrective Actions and Treatment Techniques).

(20) **Groundwater corrective action plan**--A plan approved by the executive director documenting the steps to be taken to address fecal contamination of a groundwater source as described under §290.116(b) of this title. The groundwater corrective action plan must be approved within 30 of being notified of the fecal contamination.

(21) **Groundwater system**--For the purposes of compliance with §290.109 of this title (relating to Microbial Contaminants) and with §290.116 of this title (relating to Groundwater Corrective Actions and Treatment Techniques), a public water system that provides, uses, or distributes any groundwater

except if the groundwater is combined with surface water (or with groundwater under the direct influence of surface water) prior to treatment.

(22) **Haloacetic acids (five) (HAA5)**--The sum of the monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid concentrations in milligrams per liter, rounded to two significant figures after adding the sum.

(23) **Halogen**--One of the chemical elements chlorine, bromine, or iodine.

(24) **Hydrogeologic sensitivity assessment**--A determination of whether groundwater systems obtain water from hydrogeologically sensitive sources.

(25) **Locational running annual average (LRAA)**--The average of analytical results for samples taken at a specific monitoring location during the previous four calendar quarters.

(26) **Maximum contaminant level (MCL)--**The maximum concentration of a regulated contaminant that is allowed in drinking water before the public water system is cited for a violation. Maximum contaminant levels for regulated contaminants are defined in the applicable sections of this subchapter.

(27) **Maximum residual disinfectant level (MRDL)**--The disinfectant concentration that may not be exceeded in the distribution system. There is convincing evidence that addition of a disinfectant is necessary for control of waterborne microbial contaminants.

(28) **Minimum acceptable disinfectant residual**--The lowest disinfectant concentration allowed in the distribution system for microbial control.

(29) **Operational evaluation level (OEL)**--Calculated level of TTHM or HAA5, an exceedance of which requires a system to perform an evaluation of factors in the distribution system contributing to disinfection by-product formation and submit an operation evaluation report as described in §290.115(e)(2) of this title (relating to Stage 2 Disinfection By-products (TTHM and HAA5)). The OEL at any monitoring location is the sum of the two previous quarters' results plus twice the current quarter's result, divided by 4 to determine an average.

(30) **Raw water**--Water prior to any treatment including disinfection that is intended to be used, after treatment, as drinking water.

(A) Raw groundwater is water from a groundwater source.

(B) Raw surface water is any water from a surface water source or from a groundwater under the direct influence of surface water source.

(31) **Raw groundwater source sampling**--Fecal indicator sampling at untreated groundwater sources including triggered source water and assessment source monitoring.

(32) **Specific ultraviolet absorption at 254 nanometers (nm) (SUVA)**--An indirect indicator of whether the organic carbon in water is humic or non-humic. It is calculated by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (UV254) (in inverse meters) by its concentration of dissolved organic carbon (DOC) (in milligrams per liter).

(33) **Total organic carbon (TOC)**--The concentration of total organic carbon, in milligrams per liter, measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two significant figures. TOC is a surrogate measure for precursors to formation of disinfection by-products.

(34) **Total trihalomethanes (TTHM)**--The sum of the chloroform, dibromochloromethane, bromodichloromethane, and bromoform concentrations in milligrams per liter, rounded to two significant figures after summing.

(35) **Triggered source water monitoring--**Raw groundwater source monitoring required for systems not providing at least 4-log treatment of viruses when a routine distribution coliform sample is positive.

(36) **Trihalomethane (THM)**--One of the family of organic compounds named as derivatives of methane, wherein three of the four hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure.

(37) **Wholesale system**--A public water system that delivers water to another public water system.

§290.104. Summary of Maximum Contaminant Levels, Maximum Residual Disinfectant Levels, Treatment Techniques, and Action Levels.

(a) Summary table purpose. The maximum contaminant levels (MCLs), maximum residual disinfectant levels (MRDLs), treatment techniques, and action levels are presented in this section as a reference source. Only the regulatory concentrations are shown in these tables. Compliance requirements are given in the specific section for each chemical.

(b) MCLs for inorganic compounds. The MCLs for inorganic contaminants listed in this subsection apply to public water systems as provided in §290.106 of this title (relating to Inorganic Contaminants).

Figure: 30 TAC §290.104(b)

Contaminant	MCL (mg/L)
Antimony	0.006
Arsenic	0.010
Asbestos	7 million fibers/liter (longer than 10 µm)
Barium	2
Beryllium	0.004
Cadmium	0.005
Chromium	0.1
Cyanide	0.2 (as free Cyanide)
Fluoride	4.0
Mercury	0.002

Nitrate	10 (as Nitrogen)
Nitrite	1 (as Nitrogen)
Nitrate & Nitrite (Total)	10 (as Nitrogen)
Selenium	0.05
Thallium	0.002

(c) MCLs for organic compounds. The following MCLs for synthetic organic contaminants and volatile organic contaminants apply to public water systems as provided in §290.107 of this title (relating to Organic Contaminants).

(1) The following are the MCLs for synthetic organic contaminants.

Figure: 30 TAC §290.104(c)(1)

Contaminant	MCL (mg/L)
Alachlor	0.002
Atrazine	0.003
Benzopyrene	0.0002
Carbofuran	0.04
Chlordane	0.002
Dalapon	0.2
Dibromochloropropane	0.0002
Di(2-ethylhexyl)adipate	0.4
Di(2-ethylhexyl)phthalate	0.006
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylene dibromide	0.00005
Glyphosate	0.7
Heptachlor	0.0004
Heptachlor epoxide	0.0002
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.04
Oxamyl (Vydate)	0.2
Pentachlorophenol	0.001
Picloram	0.5
Polychlorinated biphenyls (PCB)	0.0005
Simazine	0.004
Toxaphene	0.003
2,3,7,8-TCDD (Dioxin)	3×10^{-8}
2,4,5-TP	0.05
2,4-D	0.07

(2) The following are the MCLs for volatile organic contaminants.

Figure: 30 TAC §290.104(c)(2)

Contaminant	MCL (mg/L)
1,1-Dichloroethylene	0.007
1,1,1-Trichloroethane	0.2
1,1,2-Trichloroethane	0.005
1,2-Dichloroethane	0.005
1,2-Dichloropropane	0.005
1,2,4-Trichlorobenzene	0.07
Benzene	0.005
Carbon tetrachloride	0.005
cis-1,2-Dichloroethylene	0.07
Dichloromethane	0.005
Ethylbenzene	0.7
Monochlorobenzene	0.1
o-Dichlorobenzene	0.6
para-Dichlorobenzene	0.075
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1
trans-1,2-Dichloroethylene	0.1
Trichloroethylene	0.005
Vinyl chloride	0.002
Xylenes (total)	10

(d) MCLs for radionuclide contaminants. MCLs for radionuclide contaminants apply to public water systems as provided in §290.108 of this title (relating to Radionuclides Other than Radon).

(e) Microbial contaminants. The MCL for microbial or bacteriological contaminants applies to public water systems as provided in §290.109 of this title (relating to Microbial Contaminants). The MCL for microbiological contaminants is based on the presence or absence of total coliform bacteria in a sample.

(f) Minimum residual disinfectant concentrations and MRDLs. Minimum residual disinfectant concentrations and MRDLs apply to public water systems as provided in §290.110 of this title (relating to Disinfectant Residuals).

(1) The minimum residual disinfectant concentration in the water entering the distribution system is 0.2 milligrams per liter (mg/L) free chlorine or 0.5 mg/L chloramine.

(2) The minimum residual disinfectant concentration in the water within the distribution system is 0.2 mg/L free chlorine or 0.5 mg/L chloramine.

(3) The MRDL of chlorine dioxide in the water entering the distribution system is 0.8 mg/L.

(4) The MRDL of free chlorine or chloramine in the water within the distribution system is 4.0 mg/L based on a running annual average.

(g) Surface water treatment. Systems treating surface water or groundwater under the direct influence of surface water must meet the turbidity treatment technique requirements as provided in §290.111 of this title (relating to Surface Water Treatment).

(1) The turbidity level of the combined filter effluent must never exceed 1.0 nephelometric turbidity unit (NTU) and the turbidity level of the combined filter effluent must be 0.3 NTU or less in at least 95% of the samples tested each month.

(2) Systems are subject to the raw water monitoring, pathogen removal and inactivation and individual filter turbidity provisions of §290.111 of this title.

(h) Disinfection by-product precursors. The treatment technique requirements for disinfection by-product precursors apply to water systems as provided in §290.112 of this title (relating to Total Organic Carbon (TOC)).

(i) Disinfection by-products (total trihalomethanes (TTHM) and haloacetic acids (HAA5)). The MCLs for TTHM and HAA5 apply to water systems as provided in §290.113 of this title (relating to Stage 1 Disinfection By-products (TTHM and HAA5)) and in §290.115 of this title (relating to Stage 2 Disinfection By-products (TTHM and HAA5)). The MCLs for TTHM and HAA5 are:

(1) 0.080 mg/L for TTHM; and

(2) 0.060 mg/L for HAA5.

(j) Disinfection by-products other than TTHM and HAA5. The MCLs for chlorite and bromate apply to water systems as provided in §290.114 of this title (relating to Other Disinfection By-products (Chlorite and Bromate)). The MCLs for chlorite and bromate are as follows:

(1) 1.0 mg/L for chlorite; and

(2) 0.010 mg/L for bromate.

(k) Lead and copper action levels. The action levels for lead and copper apply to water systems as provided in §290.117 of this title (relating to Regulation of Lead and Copper). Action levels for lead and copper are as follows:

(1) 0.015 mg/L for lead; and

(2) 1.3 mg/L for copper.

(l) Recycle streams. The treatment technique requirements for recycle streams are specified in §290.42(c)(6) and (d)(3) of this title (relating to Water Treatment).

§290.106. Inorganic Contaminants.

(a) Applicability. All public water systems are subject to the requirements of this section.

(1) Community and nontransient, noncommunity systems shall comply with the requirements of this section regarding monitoring, reporting, and maximum contaminant levels (MCLs) for all inorganic contaminants (IOCs) listed in this section.

(2) Transient, noncommunity systems shall comply with the requirements of this section regarding monitoring, reporting, and MCL for nitrate and nitrite.

(3) For purposes of this section, systems using groundwater under the direct influence of surface water shall meet the inorganic sampling requirements given for surface water systems.

(b) Maximum contaminant levels for IOCs. The MCLs for IOCs listed in the following table apply to community and nontransient, noncommunity water systems. The MCLs for nitrate, nitrite, and total nitrate and nitrite also apply to transient, noncommunity water systems.

Figure: 30 TAC §290.106(b)

Contaminant	**MCL (mg/L)**
Antimony	0.006
Arsenic	0.010
Asbestos	7 million fibers/liter (longer than 10µm)
Barium	2
Beryllium	0.004
Cadmium	0.005
Chromium	0.1
Cyanide	0.2 (as free Cyanide)
Fluoride	4.0
Mercury	0.002
Nitrate	10 (as Nitrogen)
Nitrite	1 (as Nitrogen)
Nitrate & Nitrite (Total)	10 (as Nitrogen)
Selenium	0.05
Thallium	0.002

(c) Monitoring requirements for IOCs. Public water systems shall monitor for IOCs at the locations specified by the executive director. All monitoring conducted under the requirements of this

section must be conducted at sites designated in the public water system's monitoring plan. Each public water system shall monitor at the time designated during each compliance period.

(1) Routine monitoring locations for IOCs except asbestos. Antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nitrate, nitrite, selenium, and thallium shall be monitored at each entry point to the distribution system.

(A) If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point that is representative of all sources and during periods of normal operating conditions.

(B) Systems shall take all subsequent samples at the same entry point to the distribution system unless the executive director determines that conditions make another entry point more representative of the source or treatment plant being monitored.

(C) The executive director may approve the use of composite samples.

(i) Compositing must be done in the laboratory or in the field by persons designated by the executive director.

(ii) Compositing shall be allowed only at groundwater entry points to the distribution system.

(iii) Compositing shall be allowed only within a single system. Samples from different systems shall not be included in a composite sample.

(iv) No more than five individual samples shall be included in a composite sample.

(v) The maximum number of individual samples allowed in a composite sample shall not exceed the number obtained by dividing the MCL for the contaminant by the detection limit of the analytical method and rounding the quotient to the next lowest integer. Detection limits for each analytical method are as listed in 40 Code of Federal Regulations (CFR) §141.23(a)(4)(i).

(vi) If the concentration in the composite sample is greater than or equal to the proportional contribution of the MCL (e.g., 20% of MCL when five points are composited) for any inorganic chemical, then a follow-up sample must be collected from each sampling point included in the composite sample.

(I) Follow-up samples must be collected within 14 days of receipt of the composite sample results.

(II) If duplicates of the original sample taken from each entry point to the distribution system used in the composite are available, the system may use these instead of resampling. The duplicates must be analyzed within 14 days of the composite.

(III) The follow-up or duplicate samples must be analyzed for the contaminant(s) which were excessive in the composite sample.

(D) Initial monitoring for a new water source must be conducted at a site representative of the water quality of the new source of water. For systems with one well and one entry point, initial monitoring may be conducted at the entry point to the distribution system.

(2) Monitoring locations for asbestos. Asbestos shall be monitored at locations where asbestos contamination is most likely to occur.

(A) A system vulnerable to asbestos contamination due solely to source water shall sample at the entry point to the distribution system.

(B) A system vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe shall sample at a tap served by asbestos-cement pipe, under conditions where asbestos contamination is most likely to occur.

(C) A system vulnerable to asbestos contamination due both to its source water supply and corrosion of asbestos-cement pipe shall sample at a tap served by asbestos-cement pipe, under conditions where asbestos contamination is most likely to occur.

(D) The executive director may require additional sampling locations based on the size, length, age, and location of asbestos-cement pipe in the distribution system. The system must

provide information regarding the size, length, age, and location of asbestos-cement pipe in the distribution system to the executive director upon request.

(3) Initial monitoring frequency for IOCs except asbestos. Prior to using water as a drinking water source, public water systems shall monitor at the frequency determined by the executive director to ensure that the water distributed to customers will comply with the MCLs for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, nitrate, nitrate, nitrate and nitrite (total), mercury, selenium, and thallium.

(4) Monitoring frequency for IOCs except asbestos, nitrate, and nitrite. Community and nontransient, noncommunity public water systems shall monitor for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium at the following frequency.

(A) Routine monitoring frequency. A public water system shall routinely monitor for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium.

(i) Each groundwater entry point shall be sampled once every three years.

(ii) Each surface water entry point shall be sampled annually.

(iii) Each of the sampling frequencies listed in this paragraph constitutes one round of sampling for groundwater and surface water entry points, respectively.

(B) Reduced monitoring. The executive director may reduce the monitoring frequency for a system that has completed a minimum of three rounds of sampling by granting a waiver to the routine monitoring frequency for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium.

(i) Systems that use a new water source are not eligible for a waiver until three rounds of sampling from the new source have been completed.

(ii) To be considered for a waiver, systems shall demonstrate that all previous analytical results at that sample site were less than the MCL.

(iii) In determining the appropriate reduced monitoring frequency, the executive director shall consider:

(I) the reported contaminant concentrations from all previous samples;

(II) the degree of variation in reported concentrations; and

(III) other factors that may affect contaminant concentrations such as changes in groundwater pumping rates, changes in the system's configuration, changes in the system's operating procedures, or changes in the flow or characteristics of a reservoir or stream used as the water source.

(iv) If the executive director grants a waiver, it shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the executive director. The executive director shall review and, where appropriate, revise the waiver of monitoring frequency when other data relevant to the system becomes available.

(v) The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

(vi) A system must take a minimum of one sample during each compliance cycle while the waiver is effective.

(C) Increased monitoring. The executive director may increase the monitoring frequency for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, or thallium.

(i) If the results from a sample site exceed any of the MCLs in subsection (b) of this section, the system shall immediately begin quarterly sampling at that sample site starting in the next quarter after the exceedance occurs.

(ii) After the initiation of quarterly monitoring, the executive director may return a system to the routine monitoring frequency if monitoring shows that the sampling site is reliably and consistently below the MCL.

(I) The executive director shall not decrease the quarterly sampling requirement until a groundwater system has taken a minimum of two quarterly samples.

(II) The executive director shall not decrease the quarterly sampling requirement until a surface water system has taken a minimum of four quarterly samples.

(5) Asbestos monitoring frequency. Community and nontransient, noncommunity water systems shall monitor for asbestos at the following frequency.

(A) A public water system shall routinely monitor for asbestos once during the first three years of each compliance cycle.

(B) The executive director may waive the routine monitoring frequency requirements for asbestos.

(i) When determining if a waiver should be granted, the executive director shall consider:

(I) the potential for asbestos contamination of the water source;

(II) the use of asbestos-cement pipe for finished water distribution; and

(III) the corrosivity of the water.

(ii) If the executive director grants a waiver, it shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the executive director. The executive director shall review and, where appropriate, revise the waiver of monitoring frequency when other data relevant to the system becomes available.

(iii) The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

(C) The executive director may increase the monitoring frequency for asbestos.

(i) A system that exceeds the MCL for asbestos shall sample quarterly beginning in the next quarter after the violation occurs.

(ii) After the initiation of quarterly sampling, the executive director may return a system to the routine monitoring frequency if monitoring shows that the system is reliably and consistently below the MCL.

(I) The executive director shall not decrease the quarterly sampling requirement until a groundwater system has taken a minimum of two quarterly samples.

(II) The executive director shall not decrease the quarterly sampling requirement until a surface (or combined surface water and groundwater) water system has taken a minimum of four quarterly samples.

(6) Nitrate monitoring frequency. All public water systems shall monitor for nitrate at the following frequency.

(A) Routine nitrate monitoring frequency. All public water systems shall routinely monitor for nitrate.

(i) All public water systems shall annually sample at each groundwater entry point to the distribution system.

(ii) A community or nontransient, noncommunity water system shall sample quarterly at each surface water entry point to the distribution system.

(iii) A transient, noncommunity water system shall sample annually at each surface water entry point to the distribution system.

(B) Reduced nitrate monitoring frequency. The executive director may reduce the monitoring frequency for community or nontransient, noncommunity water systems using surface water sources by granting a waiver to the routine monitoring frequency.

(i) To be considered for a waiver, a system shall demonstrate that the nitrate concentration in each sample collected during the previous four consecutive quarters was less than 50% of the nitrate MCL.

(ii) If the executive director grants a waiver, it shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the executive director. The executive director shall review and, where appropriate, revise the waiver of monitoring frequency when other data relevant to the system becomes available.

(iii) A system that receives a waiver to the routine nitrate monitoring frequency must sample annually for nitrate. The annual sample must be collected in the quarter that previously resulted in the highest nitrate concentration.

(C) Increased nitrate monitoring frequency. The executive director may increase the nitrate monitoring frequency for community or nontransient, noncommunity water systems using groundwater sources.

(i) A system that is sampling annually shall begin quarterly nitrate sampling if the nitrate concentration in any sample is equal to or greater than 50% of the nitrate MCL. Quarterly sampling must begin the first quarter after the elevated nitrate level was detected.

(ii) After the initiation of quarterly sampling, the executive director may return a system to the routine annual nitrate monitoring frequency if quarterly sampling shows that the system is reliably and consistently below the nitrate MCL for a minimum of four consecutive quarters.

(7) Nitrite monitoring frequency. All public water systems shall monitor for nitrite at the following frequency.

(A) All public water systems shall routinely take one nitrite sample during the first three years of each compliance cycle.

(B) The executive director may reduce the monitoring frequency for nitrite by granting a waiver to the routine monitoring frequency.

(i) To be considered for a waiver, a system shall demonstrate that the nitrite concentration in the initial sample was less than 50% of the nitrite MCL.

(ii) If the executive director grants a waiver, it shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the executive

director. The executive director shall review and, where appropriate, revise the waiver of monitoring frequency when other data relevant to the system becomes available.

(iii) A system that receives a waiver to the routine nitrite monitoring frequency must sample at a frequency specified by the executive director.

(C) The executive director may increase the monitoring frequency for nitrite.

(i) A system shall sample quarterly for at least one year following any sample in which the nitrite concentration is greater than or equal to 50% of the MCL.

(ii) The executive director may allow a system to return to the routine monitoring frequency after determining the system is reliably and consistently less than the MCL.

(8) Confirmation sampling for all IOCs. The executive director may require a public water system to confirm the results of any individual sample.

(A) If a sample result exceeds the MCL, a public water system may be required to collect one additional sample to confirm the results of the initial test. If an additional sample is required:

(i) Confirmation samples must be collected at the same entry point to the distribution system as the sample that exceeded the MCL;

(ii) Confirmation samples for IOCs except nitrate and nitrite shall be collected as soon as possible after the system receives the analytical results of the first sample; and

(iii) Confirmation samples for nitrate and nitrite shall be collected within 24 hours of the system's receipt of notification of the analytical results of the first sample. Systems unable to comply with the 24-hour sampling requirement must immediately notify the consumers served by the public water system in accordance with subsection (f) of this section. Systems exercising this option must take and analyze a confirmation sample within two weeks of notification of the analytical results of the first sample.

(B) The executive director may require a confirmation sample for any sample with questionable results.

(9) More frequent monitoring. The executive director may require more frequent monitoring than specified in paragraphs (4) - (7) of this subsection.

(d) Analytical requirements for IOCs. Analytical procedures shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for inorganic contaminants shall be performed at a laboratory certified by the executive director.

(e) Reporting requirements for IOCs. Upon the request of the executive director, the owner or operator of a public water system must provide the executive director with a copy of the results of any

test, measurement, or analysis required by this subsection. The copies must be submitted within ten days of the request or within ten days of their receipt by the public water system, whichever is later. The copies must be mailed to the Texas Commission on Environmental Quality, Water Supply Division, MC 155, P.O. Box 13087, Austin, Texas 78711-3087.

(f) Compliance determination for IOCs. Compliance with this section shall be determined using the following criteria.

(1) Compliance with the MCL for each IOC shall be based on the analytical results obtained at each individual sampling point.

(2) A public water system that exceeds the levels for nitrate, nitrite, or the sum of nitrate and nitrite specified in subsection (b) of this section commits an acute MCL violation. Compliance shall be based on the results of the single sample. If a confirmation sample is collected, compliance shall be based on the average result of the original and confirmation samples.

(3) A public water system that exceeds the levels of antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, or thallium (i.e., any IOC except nitrate and nitrite) specified in subsection (b) of this section at any sampling point commits an MCL violation.

(A) For systems that are sampling annually or less frequently, compliance may be based on the results of a single sample, if a confirmation sample is not collected.

(B) For systems that are sampling annually or less frequently, if a confirmation sample is collected, compliance will be based on the average result of the original and confirmation samples.

(C) For systems that are sampling more frequently than annually, compliance is based on the running annual average for each sampling point.

(D) If a single quarterly sample would cause the running annual average to be exceeded, then the system is immediately out of compliance.

(4) Any result below the method detection limits of 40 CFR §141.23(a)(4)(i) shall be considered to be zero for the purpose of calculating compliance.

(5) The executive director may exclude the results of obvious sampling errors from the compliance calculations.

(6) Compliance with the IOC MCLs must be based on the results of all samples required by the executive director, regardless of whether that number is greater or less than the minimum required number.

(7) For purposes of determining compliance, arsenic results must be reported to the nearest 0.001 mg/L.

(8) A public water system that fails to do a required public notice or certify that the public notice has been performed commits a public notice violation.

(g) Public notice for IOCs. A public water system that violates the requirements of this section must notify the executive director and the system's customers.

(1) A public water system that violates the MCL for nitrate, nitrite, or the sum of nitrate and nitrite shall notify the executive director within 24 hours and the water system customers of this acute violation in accordance with the requirements of §290.122(a) of this title (relating to Public Notification).

(2) A public water system that violates the MCL for nitrate, nitrite, or the sum of nitrate and nitrite that is unable to comply with the 24-hour confirmation sampling requirement must immediately notify the consumers served by the public water system in accordance with §290.122(a) of this title.

(3) A public water system that fails to meet the MCL for any of the regulated IOCs except nitrate and nitrite (i.e., antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium) shall notify the executive director by the end of the next business day and the water system customers in accordance with the requirements of §290.122(b) of this title.

(4) A public water system that fails to conduct the monitoring required by this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

(5) If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the executive director may allow the system to give public notice to only the area served by that portion of the system that is out of compliance.

(h) Best available technology (BAT) for IOCs. BAT for treatment of violations of MCLs in subsection (b) of this section are listed in 40 CFR §141.62.

(i) Small system compliance technologies (SSCTs) for arsenic. SSCTs for arsenic are listed in 40 CFR §141.62(d) and may be utilized with commission approval. When point-of-use or point-of-entry devices are used for compliance, the water system must develop a program for the long-term operation, maintenance, and monitoring of the devices to ensure adequate performance.

(j) Bottled water. In accordance with 40 CFR §141.101, bottled water may be used on a temporary basis only and with approval by the commission in order to avoid unreasonable risk to health.

§290.107. Organic Contaminants.

(a) Applicability. All community and nontransient, noncommunity water systems shall comply with the requirements of this section regarding organic contaminants. For purposes of this section,

systems using groundwater under the direct influence of surface water shall meet the organic sampling requirements given for surface water systems.

(b) Maximum contaminant levels (MCLs) for organic contaminants. The concentration of synthetic and volatile organic chemicals shall not exceed the MCLs specified in this section.

(1) The following are MCLs for synthetic organic chemical (SOC) contaminants.

Figure: 30 TAC §290.107(b)(1)

Contaminant	MCL (mg/L)
Alachlor	0.002
Atrazine	0.003
Benzopyrene	0.0002
Carbofuran	0.04
Chlordane	0.002
Dalapon	0.2
Dibromochloropropane	0.0002
Di(2-ethylhexyl)adipate	0.4
Di(2-ethylhexyl)phthalate	0.006
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylene dibromide	0.00005
Glyphosate	0.7
Heptachlor	0.0004
Heptachlor epoxide	0.0002
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.04
Oxamyl (Vydate)	0.2
Pentachlorophenol	0.001
Picloram	0.5
Polychlorinated biphenyls (PCB)	0.0005
Simazine	0.004
Toxaphene	0.003
2,3,7,8-TCDD (Dioxin)	3×10^{-8}
2,4,5-TP	0.05
2,4-D	0.07

(2) The following are MCLs for volatile organic chemical (VOC) contaminants.

Figure: 30 TAC §290.107(b)(2)

Contaminant	MCL (mg/L)
1,1-Dichloroethylene	0.007
1,1,1-Trichloroethane	0.2
1,1,2-Trichloroethane	0.005
1,2-Dichloroethane	0.005
1,2-Dichloropropane	0.005
1,2,4-Trichlorobenzene	0.07
Benzene	0.005
Carbon tetrachloride	0.005
cis-1,2-Dichloroethylene	0.07
Dichloromethane	0.005
Ethylbenzene	0.7
Monochlorobenzene	0.1
o-Dichlorobenzene	0.6
para-Dichlorobenzene	0.075
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1
trans-1,2-Dichloroethylene	0.1
Trichloroethylene	0.005
Vinyl chloride	0.002
Xylenes (total)	10

(3) Each public water system must certify annually to the executive director (using third-party or manufacturer's certification) that when acrylamide or epichlorohydrin are used in drinking water systems, the combination (or product) of dose and monomer level does not exceed 0.05% dosed at 1.0 milligrams per liter (mg/L) (or equivalent) for acrylamide and 0.01% dosed at 20 mg/L (or equivalent) for epichlorohydrin.

(c) Monitoring requirements for organic contaminants. Public water systems shall monitor for organic contaminants at the locations and frequency in paragraphs (1) and (2) of this subsection. All

monitoring conducted under the requirements of this section must be conducted at sites designated in the public water system's monitoring plan. All samples must be taken during periods of normal operation.

(1) SOC monitoring requirements. Monitoring of the SOC contaminants shall be conducted at the frequency and locations given in this paragraph.

(A) SOC monitoring locations. Monitoring of the SOC contaminants shall be conducted at the following locations.

(i) Systems shall routinely sample at sample sites representative of each entry point to the distribution system.

(ii) Subsequent samples must be taken at the same sample site unless the executive director determines that a change in conditions makes a different sample site more representative of the water available to customers.

(iii) The executive director must approve any change in sampling location.

(B) Initial SOC monitoring frequency. Prior to using a new source of water as drinking water, public water systems shall monitor at the frequency established by the executive director to ensure that the water distributed to customers will comply with the MCLs for SOCs.

(C) Routine SOC monitoring frequency. Monitoring of the SOC contaminants shall be conducted at the following frequency.

(i) Community and nontransient noncommunity water systems shall take four consecutive quarterly samples for each SOC contaminant listed in subsection (b)(1) of this section during each compliance period beginning with the initial compliance period.

(ii) Community and nontransient noncommunity water systems serving more than 3,300 persons that do not detect a contaminant in the initial compliance period may reduce the sampling frequency at that sample site to a minimum of two consecutive quarterly samples in one year during each repeat compliance period.

(iii) Community and nontransient noncommunity water systems serving 3,300 persons or fewer that do not detect a contaminant in the initial compliance period may reduce the sampling frequency at that sample site to a minimum of one sample during each repeat compliance period.

(iv) Each public water system shall monitor at the time designated by the executive director within each compliance period.

(D) Increased SOC monitoring. The executive director may change the monitoring frequency for SOCs.

(i) Entry points that exceed the SOC MCLs of subsection (b)(1) of this section as determined by subsection (f) of this section must be monitored quarterly. After a minimum of four quarterly samples shows the system is in compliance and the executive director determines the system is reliably and consistently below the MCL, as determined by the methods specified in subsection (f) of this section, the executive director may allow the system to monitor annually. Systems that monitor annually must monitor during the quarter that previously yielded the highest analytical result.

(ii) The executive director may change the monitoring frequency if an organic SOC contaminant is detected in any sample.

(I) If an organic SOC contaminant is detected in any sample, the system must monitor quarterly at each entry point to the distribution system at which a detection occurs.

(II) After a system collects a minimum of two consecutive quarterly samples at a groundwater sample site, the executive director may decrease the quarterly monitoring requirement specified in subclause (I) of this clause, if the sample site is reliably and consistently below the MCL.

(III) After a system collects a minimum of four consecutive quarterly samples at a surface water sample site or a groundwater under the direct influence of surface water sample site, the executive director may decrease the quarterly monitoring requirement specified in subclause (I) of this clause, if the sample site is reliably and consistently below the MCL.

(IV) After the executive director determines that a sample site is reliably and consistently below the MCL, the executive director may allow the sample site to be monitored annually. Systems that monitor annually must monitor during the quarter that previously yielded the highest analytical result.

(V) Sample sites that have three consecutive annual samples with no detection of a contaminant may be granted a waiver at the discretion of the executive director. The executive director will consider the waiver for each compliance period.

(VI) If monitoring results in detection of one or more of certain related contaminants (i.e., heptachlor and heptachlor epoxide), then subsequent monitoring shall analyze for all related contaminants.

(iii) The executive director may increase the required SOC monitoring frequency, where necessary, to detect variations within the system (e.g., fluctuations in concentration due to seasonal use, changes in water source, etc.).

(iv) The executive director may require a confirmation sample for positive or negative results. If a confirmation sample is required by the executive director, the result must be averaged with the first sampling result and the average used for the compliance determination as specified in subsection (f) of this section. The executive director has discretion to delete results of obvious sampling errors from this calculation.

(E) Waivers for SOC monitoring. The executive director may grant a waiver to reduce the SOC monitoring frequency from the monitoring frequency requirements of subparagraphs (B) and (C) of this paragraph, based on previous use of the contaminant within the watershed or zone of influence of the water source. Examples of use of a contaminant include transport, storage, or disposal. If a determination by the executive director reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted. If the executive director cannot determine whether the contaminant has been used in the watershed or if the contaminant has been used previously, then the following factors shall be used to determine whether a waiver is granted:

(i) previous analytical results;

(ii) the proximity of the system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at drinking water sources, manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Non-point sources include the use of pesticides to control insects, weeds, or pests on agricultural areas, forest lands, home and garden property, or other land application uses;

(iii) the environmental persistence and transport of the pesticide herbicide or contaminant;

(iv) how well the water source is protected against contamination due to such factors as depth of the well, type of soil, and the integrity of well construction. Surface water systems must consider watershed vulnerability and protection;

(v) elevated nitrate levels at the water supply source; and

(vi) use of polychlorinated byphenyls (PCBs) in equipment used in the production, storage, or distribution of water (i.e., PCBs used in pumps, transformers, etc.).

(F) Compositing for SOC monitoring. The executive director may reduce the total number of samples required from a system for analysis by allowing the use of compositing. Composite samples from a maximum of five entry points to the distribution system are allowed. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.

(i) If any of the SOC contaminants listed in subsection (b)(1) of this section are detected in a composite sample, then a follow-up sample must be taken from each entry point to the distribution system included in the composite and analyzed within 14 days of collection.

(ii) If duplicates of the original SOC sample taken from each entry point to the distribution system used in the composite are available, the executive director may use these duplicates instead of resampling. The duplicate must be analyzed within 14 days of collection and the results reported to the executive director.

(iii) Compositing may only be permitted at entry points to the distribution system within a single system.

(2) VOC monitoring requirements. Monitoring of the VOC contaminants shall be conducted at the frequency and locations given in this paragraph.

(A) VOC monitoring locations. Monitoring of the VOC contaminants shall be conducted at the following locations.

(i) Systems shall routinely sample at sample sites representative of each entry point to the distribution system.

(ii) Subsequent samples must be taken at the same sample site unless the executive director determines that a change in conditions makes a different sample site more representative of the water available to customers.

(iii) The executive director must approve any change in sampling location.

(B) Initial VOC monitoring frequency. Prior to using water as a drinking water source, public water systems shall monitor at the frequency established by the executive director to ensure that the water distributed to customers will comply with the MCLs for VOCs.

(C) Routine VOC monitoring frequency. Monitoring of the VOC contaminants shall be conducted at the following frequency.

(i) Community and nontransient, noncommunity water systems shall take four consecutive quarterly samples for each VOC contaminant listed in subsection (b)(2) of this section during each compliance period, beginning with the initial compliance period.

(ii) If the initial monitoring for VOC contaminants has been completed, and the system did not detect any VOC contaminant listed in subsection (b)(2) of this section, the system shall take one sample annually beginning with the initial compliance period.

(iii) After a minimum of three years of annual sampling, the executive director may allow groundwater systems with no previous detection of any VOC contaminant listed in subsection (b)(2) of this section to take one sample during each compliance period.

(iv) Each community and nontransient, noncommunity groundwater system that does not detect a VOC contaminant listed in subsection (b)(2) of this section may be granted a waiver from the annual or triennial requirements of subsection (c)(2)(C)(ii) and (iii) of this section after completing the initial monitoring. For the purposes of this section, detection is defined as an analytical result of 0.0005 mg/L or greater. A waiver shall be effective for no more than six years (two compliance periods).

(v) Each public water system shall monitor at the time designated by the executive director within each compliance period.

(D) Increased VOC monitoring. The executive director may change the monitoring frequency for VOCs.

(i) Sample sites that exceed the VOC MCLs of subsection (b)(2) of this section, as determined by subsection (f) of this section, must be monitored quarterly. After a minimum of four consecutive quarterly samples that show the system is in compliance as specified in subsection (f) of this section and after the executive director determines that the system is reliably and consistently below the MCL, the executive director may allow the system to monitor annually during the quarter that previously yielded the highest analytical result.

(ii) The executive director may require a confirmation sample for positive or negative results. If a confirmation sample is required by the executive director, the result must be averaged with the first sampling result and the average is used for the compliance determination as specified by subsection (f) of this section. The executive director has discretion to delete results of obvious sampling errors from this calculation.

(iii) If a VOC contaminant listed in subsection (b)(2) of this section is detected at a level exceeding 0.0005 mg/L in any sample, then:

(I) the system must monitor quarterly at each entry point to the distribution system that resulted in a detection;

(II) the executive director may decrease the quarterly monitoring requirement specified in subsection (c)(2)(D)(iii)(I) of this section provided that the executive director has determined that the system is reliably and consistently below the MCL. In no case shall the executive director make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples;

(III) if the executive director determines that the system is reliably and consistently below the MCL, the executive director may allow the system to monitor annually. Systems that monitor annually must monitor during the quarter that previously yielded the highest analytical result;

(IV) systems which have three consecutive annual samples with no detection of a contaminant may be granted a waiver as specified in subparagraph (E) of this paragraph; and

(V) groundwater systems that have detected one or more of the following two-carbon organic compounds: trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene shall monitor quarterly for vinyl chloride. A vinyl chloride sample shall be taken at each entry point to the distribution system at which one or more of the two-carbon organic compounds was detected. If the result

of the first analysis does not detect vinyl chloride, the executive director may reduce the quarterly monitoring frequency for vinyl chloride to one sample during each compliance period. Surface water systems are required to monitor for vinyl chloride as specified by the executive director.

(iv) The executive director may increase the required VOC monitoring frequency, where necessary, to detect variations within the system (e.g., fluctuations in concentration due to seasonal use, changes in water source, etc.).

(E) Waivers for VOC monitoring. The executive director may grant a waiver after evaluating the previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the water sources. If a determination by the executive director reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted. If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted:

(i) previous analytical results;

(ii) the proximity of the system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at drinking water sources manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities;

(iii) the environmental persistence and transport of the contaminants;

(iv) the number of persons served by the public water system and the proximity of a smaller system to a larger system;

(v) how well the water source is protected against contamination (e.g., is it a surface or groundwater system). Groundwater systems must consider factors such as depth of the well, the type of soil, and well construction. Surface water systems must consider watershed protection;

(vi) as a condition of the waiver, a groundwater system must take one sample at each entry point to the distribution system during the time the waiver is effective (i.e., one sample during two compliance periods or six years) and update its vulnerability assessment considering the factors listed in this paragraph. Based on this updated vulnerability assessment, the executive director must reconfirm that the system is not vulnerable. If the executive director does not make this reconfirmation within three years of the initial determination, then the waiver is invalid and the system is required to sample annually; and

(vii) community and nontransient surface water systems that do not detect a VOC contaminant listed in subsection (b)(2) of this section may be considered by the executive director for a waiver from the annual sampling requirements of subparagraph (C)(ii) of this paragraph after completing the initial monitoring. Systems meeting this criteria must be determined by the executive director to be non-vulnerable based on a vulnerability assessment during each compliance period. Each system receiving a waiver shall sample at the frequency specified by the executive director (if any).

(F) Compositing for VOC monitoring. The executive director may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of entry points to the distribution system are allowed. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.

(i) If the VOC concentration in the composite sample is 0.0005 mg/L or greater for any contaminant listed in subsection (b)(2) of this section, then a follow-up sample must be taken and analyzed within 14 days from each entry point to the distribution system included in the composite.

(ii) If duplicates of the original sample taken from each entry point to the distribution system used in the composite are available, the system may use these instead of resampling. The duplicate must be analyzed within 14 days of collection.

(iii) Compositing may only be permitted by the executive director at entry points to the distribution system within a single system.

(iv) Procedures for compositing VOC samples are as stated in 40 Code of Federal Regulations (CFR) §141.24(f)(14)(iv).

(d) Analytical requirements for organic contaminants. Analytical procedures shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for organic contaminants shall be performed at a laboratory certified by the executive director.

(e) Reporting requirements for organic contaminants. Upon the request of the executive director, the owner or operator of a public water system must provide the executive director with a copy of the results of any test, measurement, or analysis required by this subsection. The copies must be submitted within ten days of the request or within ten days of their receipt by the public water system, whichever is later. The copies must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(f) Compliance determination for organic contaminants. Compliance with the MCLs of subsection (b)(1) and (2) of this section shall be determined based on the analytical results obtained at each entry point to the distribution system.

(1) If one sampling point is in violation of any MCL in subsection (b) of this section, then the system is in violation of the MCL for that contaminant.

(A) For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point.

(B) Systems monitoring annually or less frequently whose sample result exceeds the MCL must begin quarterly sampling; systems will not be considered in violation of the MCL until they have completed one year of quarterly sampling.

(C) If any sample result will cause the running annual average to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately.

(D) If a system fails to collect the required number of samples, compliance will be based on the total number of samples collected.

(E) If a sample result is less than the detection limit, zero will be used to calculate the annual average.

(2) The executive director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by sanctioned representatives and agencies.

(3) A public water system that fails to do a required public notice or certify that the public notice has been performed commits a public notice violation.

(g) Public notification requirements for organic contaminants. A public water system that violates the requirements of this section must notify the executive director and the system's customers. If a public water system has a distribution system separate from other parts of the distribution system with no interconnections, the executive director may allow the system to give public notice to only that portion of the system that is out of compliance.

(1) A system that violates an MCL given in subsection (b) of this section, shall report to the executive director and notify the public as provided under §290.122(b) of this title (relating to Public Notification).

(2) A public water system that fails to conduct the monitoring required by this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

(h) Best available technology for organic contaminants. Best available technology for treatment of violations of MCLs in subsection (b) of this section are listed in 40 CFR §141.61. Copies are available for review in the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

§290.108. Radionuclides Other than Radon.

(a) Applicability. All community water systems shall comply with the requirements of this section regarding radionuclide contaminants. Public water systems treating groundwater under the direct influence of surface water must comply with the radionuclide requirements for surface water systems. Public water systems shall comply with the initial monitoring requirements.

(b) Maximum contaminant levels (MCL). The concentration of radionuclide contaminants in the water entering the distribution system shall not exceed the following MCLs.

(1) MCLs for naturally occurring radionuclides are as follows:

(A) 5 picoCuries per liter (pCi/L) for combined radium-226 and radium-228, as calculated by the summation of the results for radium-226 and radium-228;

(B) 15 pCi/L for gross alpha particle activity (including radium-226 but excluding radon and uranium); and

(C) 30 micrograms per liter (µg/L) for uranium.

(2) MCLs for beta particle and photon radioactivity from man-made radionuclides in drinking water in community water systems are equivalent to the MCLs under 40 Code of Federal Regulations (CFR) §141.66(d), as amended and adopted in the CFR through December 7, 2000 (65 FR 76708), which is adopted by reference.

(c) Monitoring requirements. Public water systems shall measure the concentration of radionuclides at locations and frequencies specified in the system's monitoring plan. All samples must be collected during normal operating conditions.

(1) Monitoring frequency for naturally occurring radionuclides. The monitoring frequency requirements for gross alpha particle activity, combined radium-226 and radium-228, and uranium are as follows.

(A) Initial monitoring frequency. All systems that use a new source of water must begin to conduct initial monitoring of the new source within 90 days after initiating use of the source.

(i) If the initial monitoring results are at or above an MCL, the system must perform quarterly monitoring as described in subparagraph (C) of this paragraph.

(ii) If the initial monitoring results are below all of MCLs given in subsection (b)(1) of this section, the system shall perform routine monitoring as described in subparagraph (B) of this paragraph.

(B) Routine monitoring. The results of samples collected during initial and routine monitoring periods will be used to determine the monitoring frequency for subsequent monitoring periods.

(i) If the results for all contaminants (gross alpha particle activity, combined radium-226 and radium-228, and uranium) are below the detection limits specified in Table A of this clause, the system must collect and analyze at least one sample at that sampling point once every nine years.

Figure: 30 TAC §290.108(c)(1)(B)(i)

Table A: Detection Limits for Radionuclides

Contaminant	Detection Limit
Gross alpha particle activity	3 picoCuries per liter (pCi/L)
Radium 226	1 pCi/L
Radium 228	1 pCi/L
Uranium	1 microgram per liter

(ii) If the result for any contaminant is at or above the detection limit but at or below one-half the MCLs given in subsection (b) of this section, the system must collect and analyze at least one sample at that sampling point every six years.

(iii) If the result for any contaminant is above one-half the MCLs given in subsection (b) of this section but below the MCL, the system must collect and analyze at least one sample at that sampling point every three years.

(iv) If the result for any contaminant is at or above any of the MCLs given in subsection (b) of this section, monitoring must be performed at the frequency given in subparagraph (C) of this paragraph.

(C) Increased monitoring. A system must perform increased monitoring if any results at a sampling point are at or above the MCLs, or at the direction of the executive director.

(i) If the results for any contaminant are at or above any of the MCLs given in subsection (b) of this section, consecutive quarterly monitoring must be performed at that sample point.

(ii) If the average of quarterly monitoring results is less than the MCLs in subsection (b) of this section, the sample point may be returned to the routine sampling frequency given in subparagraph (B) of this paragraph.

(iii) To fulfill quarterly monitoring requirements a system may composite up to four consecutive quarterly samples from a single entry point if analysis is done within a year of the first sample.

(iv) The analytical results from a composite sample will be treated as the annual average to determine compliance with the MCLs and future monitoring frequency requirements.

(v) When required by the executive director, more frequent monitoring must be conducted in the vicinity of mining or other operations that may contribute alpha particle radioactivity to either surface or groundwater sources of drinking water, or when changes in the distribution system or treatment processing occur that may increase the concentration of radionuclide in the finished water.

(vi) Community public water systems shall conduct monitoring when required by the executive director.

(D) Historical data. A system may use historical data to comply with the initial monitoring requirement, if approved by the executive director.

(i) A system having only one entry point to the distribution system may use the monitoring data from the previous entry point or distribution system compliance monitoring to satisfy initial monitoring requirements.

(ii) A system with multiple entry points that has appropriate historical monitoring data for each entry point to the distribution system may use previous compliance monitoring data to satisfy initial monitoring requirements.

(iii) To satisfy initial monitoring requirements, a community water system with appropriate historical data for a representative point in the distribution system may use the monitoring data from the distribution system, provided that the executive director finds that the historical data satisfactorily demonstrates that each entry point to the distribution system is expected to be in compliance based upon the historical data and reasonable assumptions about the variability of contaminant levels between entry points.

(E) Sample invalidation. The executive director may invalidate the results of obvious sampling or analytic errors.

(F) Confirmation samples. The executive director may require more frequent monitoring or may require confirmation samples at the executive director's discretion.

(G) Sampling scheduling. Systems shall monitor at the time designated by the executive director.

(2) Monitoring and compliance for man-made radionuclides. The monitoring and compliance requirements for man-made radionuclide under 40 CFR §141.26(b), as amended and adopted in the CFR through December 7, 2000 (65 FR 76708), are adopted by reference.

(3) Monitoring locations for radionuclide contaminants. Systems must monitor at sample sites described in the system's monitoring plan.

(A) Initial monitoring for a new water source must be conducted at a site representative of the water quality of the new source of water.

(B) Routine compliance monitoring for the radionuclide covered by this section must be performed at sampling points representing each entry point to the distribution system. If results from an entry point exceed one-half the MCL, the executive director may require the system to sample all water sources providing water to that entry point.

(d) Analytical requirements for radionuclide contaminants. Analytical procedures shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for radionuclide contaminants shall be performed at a laboratory certified by the executive director.

(e) Reporting requirements. Upon the request of the executive director, the owner or operator of a public water system must provide the executive director with a copy of the results of any test, measurement, or analysis required by this section. The copies must be submitted within ten days of the request or within ten days of their receipt by the public water system, whichever is later. The copies must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(f) Compliance determination. Compliance with the requirements of this section shall be determined as follows.

(1) If the running average annual MCL for gross alpha particle activity, combined radium-226 and radium-228, or uranium as set forth in subsection (b) of this section is exceeded, based on quarterly monitoring results, the system has committed an MCL violation.

(A) A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analysis provided that the measured gross alpha particle activity does not exceed 5 pCi/L at a confidence level of 95% (1.65 theta where theta is the standard deviation of the net counting rate of the sample).

(B) When the gross alpha particle activity exceeds 5 pCi/L, the same or an equivalent sample shall be analyzed for radium-226 and radium-228.

(C) If a sample result is less than the detection limit, zero will be used to calculate the annual average, unless a gross alpha particle activity is being used in lieu of radium-226 and/or uranium. If the gross alpha particle activity result is less than detection, one-half the detection limit will be used to calculate the annual average.

(D) The results of all samples taken and analyzed under the provisions of this section will be used in determining compliance, even if that number is greater or less than the minimum required.

(E) If a system fails to complete required increased monitoring, the executive director may base compliance on all available sample results.

(F) If the results at one sample site are in violation, the public water system is in violation.

(G) When confirmation samples are collected, the average of an initial sample and its confirmation sample must be averaged for the purposes of determining compliance.

(H) To judge compliance with the MCLs, sample results must be rounded to the same number of significant figures as the MCL for the substance in question.

(2) If the average annual maximum contaminant level for man-made radionuclide set forth in subsection (b) of this section is exceeded, the system has committed an MCL violation.

(3) A public water system that fails to conduct the monitoring tests required by this subsection commits a monitoring violation.

(4) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation.

(5) A public water system that fails to do a required public notice or certify that the public notice has been performed commits a public notice violation.

(g) Public notification. A public water system that violates the requirements of this section must notify the executive director and the system's customers, as follows.

(1) A public water system that violates the MCL for gross alpha particle activity, combined radium-226 and radium-228, or uranium shall give notice to the executive director and notify the public as required by §290.122(b) of this title (relating to Public Notification).

(2) The operator of a community water system that violates the MCL for man-made radionuclide shall give notice to the executive director and to the public as required by §290.122(b) of this title.

(3) A public water system that fails to conduct the monitoring required by this subsection must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

(h) Best available technology for radionuclides other than radon. Best available technology for treatment of violations of MCLs in subsection (b) of this section are listed in 40 CFR §141.66(g).

(i) Small system compliance technologies (SSCTs) for radionuclides. SSCTs for radionuclides are listed in 40 CFR §141.66(h) and may be utilized with commission approval. When point-of-use or point-of-entry devices are used for compliance, the water system must develop a program for the long-term operation, maintenance, and monitoring of the devices to ensure adequate performance.

(j) Bottled water. In accordance with 40 CFR §141.101, bottled water may be used on a temporary basis only and with approval by the commission in order to avoid unreasonable risk to health.

§290.109. Microbial Contaminants.

(a) Applicability. All public water systems must produce and distribute water that meets the provisions of this section regarding microbial contaminants.

(b) Maximum contaminant levels (MCL) for microbial contaminants. Treatment techniques and MCL requirements for microbial contaminants are based on detection of those contaminants or fecal indicator organisms.

(1) The MCL for microbial contaminants in the distribution system is based on the presence of total or fecal coliform bacteria in routine, repeat, and increased monitoring distribution samples.

(A) For a system which collects at least 40 routine distribution samples per month, the MCL is defined as when more than 5.0% of samples collected in a month are coliform positive.

(B) For a system which collects fewer than 40 routine distribution samples per month, the MCL is defined as when more than one sample is coliform positive.

(C) The acute MCL is defined as when a repeat sample is fecal coliform or *E. coli* positive; or a total coliform positive repeat sample follows a fecal coliform or *E. coli* positive routine sample.

(2) For systems required to collect raw groundwater samples, the standard is no detection of fecal indicators in a raw groundwater samples.

(c) Monitoring requirements for microbial contaminants. Public water systems shall collect samples for total coliform, fecal coliform, *E. coli*, or other fecal indicator organisms at locations and frequency as directed by the executive director. All compliance samples must be collected during normal operating conditions.

(1) Routine microbial sampling locations. Public water systems shall routinely monitor for microbial contaminants at the following locations.

(A) Public water systems must collect routine distribution coliform samples at active service connections which are representative of water quality throughout the distribution system. Other sampling sites may be used if located adjacent to active service connections.

(B) Public water systems shall collect distribution coliform samples at locations specified in the system's monitoring plan.

(2) Routine distribution coliform sampling frequency. Public water systems must sample for distribution coliform at the following frequency:

(A) Community and noncommunity public water systems must collect routine distribution coliform samples at a frequency based on the population served by the system.

(i) the population for noncommunity systems will be based on the maximum number of persons served on any given day during the month;

(ii) the population of community systems will be based on the data reported during the most recent sanitary survey of the public water system; and

(iii) the minimum sampling frequency for public water systems is shown in the following table.

Figure: 30 TAC §290.109(c)(2)(A)(iii)

Population Served	Minimum Number of Samples per Month
1 to 1,000	1
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

(B) A public water system which uses surface water or groundwater under the direct influence of surface water must collect routine distribution coliform samples at regular time intervals throughout the month.

(C) A public water system which uses only uses only purchased water or groundwater not under the direct influence of surface water and serves more than 4,900 persons must collect routine distribution coliform samples at regular time intervals throughout the month.

(D) A public water system which uses only purchased water or groundwater not under the direct influence of surface water and serves 4,900 persons or fewer may collect all required routine distribution coliform samples on a single day if they are taken from different sites.

(E) A total coliform-positive sample invalidated under this subsection does not count towards meeting the minimum routine monitoring requirements of this subsection.

(F) If a system collecting fewer than five routine distribution coliform samples per month has one or more total coliform-positive samples and the executive director does not invalidate the sample(s) in accordance with subsection (c)(4) of this section, it must collect at least five routine distribution coliform samples during the next month the system provides water to the public.

(3) Repeat distribution coliform sampling requirements. Systems shall conduct repeat monitoring if one or more of the routine samples is found to contain coliform organisms.

(A) If a routine distribution coliform sample is coliform-positive, the public water system must collect a set of repeat distribution coliform samples within 24 hours of being notified of the positive result, or as soon as possible if the local laboratory is closed.

(i) A system which collects more than one routine distribution coliform sample per month must collect no fewer than three repeat samples for each coliform-positive sample found.

(ii) A system which collects one routine distribution coliform sample per month must collect no fewer than four repeat samples for each coliform-positive sample found.

(B) The system must collect all repeat samples on the same day, except a system with a single service connection may collect daily repeat samples until the required number of repeat samples has been collected.

(C) The system must collect at least one repeat sample from the sampling tap where the original 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 fourth repeat sample is required, it must be collected within five service connections upstream or downstream. If the positive routine sample was collected at the end of the distribution line, one repeat sample must be collected at that point and all other samples must be collected within five connections upstream of that point.

(D) If one or more repeat samples in the set is total coliform-positive, the public water system must collect an additional set of repeat samples in the manner specified in subparagraphs (A) - (C) of this paragraph. The additional samples must be collected within 24 hours of being notified of

the positive result or as soon as possible if the local laboratory is closed. The system must repeat this process until either total coliforms are not detected in one complete set of repeat samples or the system determines that the MCL for total coliforms has been exceeded.

(E) 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 is found to contain total coliform bacteria, then the system may count the subsequent sample(s) as a repeat sample instead of as a routine sample.

(4) Raw groundwater source monitoring. Any raw groundwater source sample required under this paragraph must be collected at a location prior to any treatment of the groundwater source.

(A) General requirements. A groundwater system must conduct triggered source water monitoring for *E. coli* or other fecal indicators, if both of the following conditions exist.

(i) The system does not provide at least 4-log treatment of viruses before or at the first customer for each groundwater source; and

(ii) The system is notified that a routine distribution coliform sample is positive and the sample is not invalidated under paragraph (5) of this subsection.

(B) Sampling requirements. A groundwater system must collect, within 24 hours of notification of the distribution total coliform positive sample, at least one raw groundwater source *E.*

coli sample from each groundwater source in use at the time the distribution coliform-positive sample was collected.

(i) The executive director may extend the 24-hour time limit on a case-by case basis if the system cannot collect the raw groundwater source sample within 24 hours due to circumstances beyond its control.

(ii) If approved by the executive director and documented in the system's monitoring plan, systems with more than one groundwater source may be allowed to sample a representative groundwater source or sources. Systems must modify their current monitoring plan to identify one or more groundwater sources that are representative of each distribution coliform sampling site and is intended to be used for representative source sampling.

(iii) A groundwater system serving 1,000 people or fewer may use one of the four required repeat samples collected from a raw groundwater source to meet both the repeat requirements of subparagraph (A)(ii) of this paragraph and the triggered raw source monitoring requirements in this paragraph. If a required repeat sample is used to meet both requirements and found to be *E. coli* positive, the system will have achieved an acute MCL as defined in subsection (b)(1)(C) of this section and corrective action will be required for the groundwater source were the sample was found to be *E. coli* positive.

(C) Consecutive and wholesale systems. Consecutive groundwater systems receiving drinking water from a wholesaler must notify the wholesale system(s) within 24 hours of being

notified of the positive coliform distribution sample. The wholesale groundwater system(s) must comply with the following:

(i) A wholesale groundwater system that receives notice of a distribution coliform sample positive from a consecutive system it serves must collect a sample from each of its groundwater sources within 24 hours of the notification and analyze each sample for the presence of *E. coli*.

(ii) If any raw source sample is *E. coli* positive, the wholesale groundwater system must notify all consecutive systems served by that groundwater source of the fecal indicator positive within 24 hours of being notified.

(D) Exceptions to the triggered source monitoring requirements. A groundwater system is not required to comply with the triggered source monitoring requirements if any of the following conditions exist.

(i) The executive director determines and documents in writing, that the distribution coliform positive sample is caused by a distribution system deficiency; or

(ii) The distribution coliform positive sample is collected at a location that meets the distribution coliform sample invalidation criteria as specified in paragraph (5) of this subsection.

(E) Assessment source monitoring. The executive director may require monthly source assessment raw monitoring without the presence of a positive total coliform distribution sample if well conditions exist that indicate the groundwater may be susceptible to fecal contamination.

(5) Culture analysis. If any routine or repeat sample is total coliform-positive, that total coliform-positive culture medium will be analyzed to determine if fecal coliforms or bacteria are present. If fecal coliforms or *E. coli* are present, the system must notify the executive director by the end of the day in accordance with subsection (g) of this section.

(d) Analytical and invalidation requirements for microbial contaminants. Analytical procedures shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for microbial contaminants shall be performed at a laboratory certified by the executive director.

(1) Distribution coliform sample invalidation. The executive director may invalidate a distribution total coliform-positive sample if one of the following conditions is met.

(A) The executive director may invalidate a sample if the laboratory provides written notice that improper sample analysis caused the total coliform-positive result.

(B) The executive director may invalidate a sample if the results of repeat samples collected as required by this section determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem. The executive director 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 within five service connections of the original tap are total coliform-negative. Under those circumstances, the system may cease resampling and request that the executive director invalidate the sample. The system must provide copies of the routine positive and all repeat samples.

(C) The executive director may invalidate a sample if there are substantial grounds to believe that the total coliform-positive result is due to a circumstance or condition which does not reflect water quality in the distribution system. In this case, the system must still collect all repeat samples required by this section, and use them to determine compliance with the MCL for total coliforms in subsection (f) of this section. The system must provide written documentation which must state the specific cause of the total coliform-positive sample, and the action the system has taken, or will take, to correct this problem. The executive director may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

(D) The executive director may invalidate a sample if the laboratory provides written notice that the sample was unsuitable for analysis.

(E) If a sample is invalidated by the laboratory, the system must collect another sample from the same location as the original sample within 24 hours of being notified, or as soon as possible if the laboratory is closed, and have it analyzed for the presence of total coliform. The system must continue to resample within 24 hours and have the samples analyzed until it obtains a valid result.

(2) A groundwater system may obtain invalidation of a fecal indicator positive groundwater source sample if the conditions of subparagraphs (A) and (B) of this paragraph apply. If the executive director invalidates a fecal indicator positive groundwater source sample, the system must collect another source sample as specified in subsection (c)(4) of this section within 24 hours of being notified of the invalidation.

(A) Notice from the laboratory must document that improper sample analysis occurred. If a laboratory invalidates a sample, the system must collect another sample from the same location as the original sample within 24 hours of being notified of the invalidated sample, and have it analyzed for the presence of *E. coli*. The system must continue to re-sample within 24 hours and have the samples analyzed until it obtains a valid result. If approved by the executive director, the 24-hour time limit may be extended.

(B) The executive director may invalidate the sample if the system provides written documentation that there is substantial evidence that a fecal indicator positive groundwater source sample is not related to source water quality. If the executive director invalidates a sample, the system must collect another sample from the same location as the original sample within 24 hours of being notified of the invalidated sample, and have it analyzed for the presence of *E. coli.*

(e) Reporting requirements for microbial contaminants. Upon the request of the executive director, the owner or operator of a public water system must provide the executive director with a copy of the results of any test, measurement, or analysis required by this subsection. The copies must be submitted within ten days of the request or within ten days of their receipt by the public water system,

whichever is later. The copies must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(f) Compliance determination for microbial contaminants. Compliance with the requirements of this section shall be determined using the following criteria each month that the system is in operation.

(1) A system commits an acute MCL violation if:

(A) A repeat distribution system sample is fecal coliform-positive or *E. coli* -positive; or

(B) A total coliform-positive repeat distribution system sample follows a fecal coliform-positive or *E. coli* -positive routine distribution system sample.

(2) A system that collects at least 40 routine distribution coliform samples per month commits a nonacute MCL violation if more than 5.0 % of the samples collected during a month are total coliform-positive, but none of the initial or repeat samples are fecal coliform-positive or *E. coli* -positive.

(3) A system that collects fewer than 40 routine distribution coliform samples per month commits a nonacute MCL violation if more than one sample collected during a month is total coliform-positive, but none of the initial or repeat samples are fecal coliform-positive or *E. coli* -positive.

(4) A public groundwater system that is required to collect raw source samples, commits a treatment technique violation if any source sample is found to be positive for *E. coli* or other approved fecal indicator. A public groundwater system is required to conduct corrective action as described in §290.116 of this title (relating to Groundwater Corrective Actions and Treatment Techniques) if a source sample is confirmed positive for *E. coli* or other fecal indicators.

(5) A public water system that fails to provide the required number of suitable distribution coliform samples commits a monitoring violation.

(6) A public water system that fails to provide the required number of suitable raw source samples commits a monitoring violation.

(7) A public water system that fails to report the results of the monitoring tests required by this section commits a reporting violation.

(8) A public water system that fails to do a required public notice or certify that notification has been performed commits a public notice reporting violation.

(9) Results of all routine and repeat distribution coliform samples not invalidated by the executive director must be included in determining compliance with the MCL for total coliforms.

(10) Distribution coliform samples invalidated by the executive director shall not be included in determining compliance with the MCL for total coliforms.

(11) Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, shall not be used to determine compliance with the MCL for microbiological contaminants.

(g) Public notification for microbial contaminants. A system that is out of compliance with the requirements described in this section must notify the public using the procedures described in §290.122 of this title (relating to Public Notification) for microbial contamination.

(1) A public water system that commits an acute MCL violation for microbial contaminants must notify the water system customers in accordance with the boil water notice requirements of §290.46(q) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems) and the public notice requirements of §290.122(a) of this title.

(2) A public groundwater system that receives a *E. coli* or other fecal indicator positive source sample that has not been invalidated must notify the water system customers within 24-hours in accordance with the requirements of §290.122(a)(1)(F) of this title. The system must continue to notify the public annually until the fecal contamination in the source water is determined by the executive director to be corrected as specified under §290.116 of this title.

(3) A public water system that has fecal coliforms or *E. coli* present must notify the executive director 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 commission's office is closed, in which case the system must notify the executive director before the end of the next business day.

(4) A public water system which commits an MCL violation must report the violation to the executive director immediately after it learns of the violation, but no later than the end of the next business day, and notify the public in accordance with §290.122(b) of this title.

(5) A public water system which has failed to comply with a coliform monitoring requirement must report the monitoring violation to the executive director within ten days after the system discovers the violation and notify the public in accordance with §290.122(c) of this title.

§290.110. Disinfectant Residuals.

(a) Applicability. All public water systems shall properly disinfect water before it is distributed to any customer and shall maintain acceptable disinfectant residuals within the distribution system.

(b) Minimum and maximum acceptable disinfectant concentrations. Public water systems shall provide the minimum levels of disinfectants in accordance with the provisions of this section. Public water systems shall not exceed the maximum residual disinfectant levels (MRDLs) provided in this section.

(1) The disinfection process used by public water systems must ensure that water has been adequately disinfected before it enters the distribution system.

(A) The disinfection process used by public water systems treating surface water sources or groundwater sources that are under the direct influence of surface water must meet the requirements of §290.111(d) of this title (relating to Surface Water Treatment).

(B) The executive director may require the disinfection process used by public water systems treating groundwater sources that are not under the direct influence of surface water to meet the requirements of §290.116 of this title (relating to Groundwater Corrective Actions and Treatment Techniques).

(C) The disinfection process at other types of treatment plants shall provide the level of disinfection required by the executive director.

(2) The residual disinfectant concentration in the water entering the distribution system shall be at least 0.2 milligram per liter (mg/L) free chlorine or 0.5 mg/L chloramine.

(3) The chlorine dioxide residual of the water entering the distribution system shall not exceed an MRDL of 0.8 mg/L.

(4) The residual disinfectant concentration in the water within the distribution system shall be at least 0.2 mg/L free chlorine or 0.5 mg/L chloramine.

(5) The running annual average of the free chlorine or chloramine residual of the water within the distribution system shall not exceed an MRDL of 4.0 mg/L.

(c) Monitoring requirements. Public water systems shall monitor the performance of the disinfection facilities to ensure that appropriate disinfectant levels are maintained. All monitoring conducted pursuant to the requirements of this section must be conducted at sites designated in the public water system's monitoring plan.

(1) Public water systems that treat surface water or groundwater under the direct influence of surface water must verify that they meet the disinfection requirements of subsection (b)(2) of this section.

(A) Public water systems that treat surface water or groundwater under the direct influence of surface water and sell treated water on a wholesale basis or serve more than 3,300 people must continuously monitor and record the disinfectant residual of the water entering the distribution system. If there is a failure in the continuous monitoring equipment, grab sampling every four hours may be conducted in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment.

(B) Public water systems that treat surface water or groundwater under the direct influence of surface water, serve 3,300 or fewer people and do not sell treated water on a wholesale basis must monitor and record the disinfectant residual of the water entering the distribution system with either continuous monitors or grab samples.

(i) If a system uses grab samples, the samples must be collected on an ongoing basis at the frequency prescribed in the following table.

Figure: 30 TAC §290.110(c)(1)(B)(i)

Entry Point Disinfectant Residual Monitoring Frequency for Grab Samples

System Size by Population	**Samples/day**
500	1
501 to 1,000	2
1,001 to 2,500	3
2,501 to 3,300	4

(ii) The grab samples cannot be taken at the same time and the sampling interval is subject to the executive director's review and approval.

(iii) Treatment plants that use grab samples and fail to detect an appropriate disinfectant residual must repeat the test at four-hour or shorter intervals until compliance has been reestablished.

(2) Public water systems that treat groundwater or that purchase and resell treated water must, upon the request of the executive director, verify that they meet the disinfection requirements of subsection (b)(2) of this section.

(3) Each treatment plant using chlorine dioxide must monitor and record the chlorine dioxide residual of the water entering the distribution system at least once each day. If the chlorine dioxide residual in the water entering the distribution system exceeds the MRDL contained in subsection (b)(3) of this section, the treatment plant must conduct additional tests.

(A) If the public water system does not have additional chlorination facilities in the distribution system, it must conduct three additional tests at the service connection nearest the treatment plant where an elevated chlorine dioxide residual was detected. The first additional test must be conducted within two hours after detecting an elevated chlorine dioxide residual at the entry point to the distribution system. The two subsequent tests must be conducted at six-hour to eight-hour intervals thereafter.

(B) If the public water system has additional chlorination facilities in the distribution system, it must conduct an additional test at the service connection nearest the treatment plant where an elevated chlorine dioxide residual was detected, an additional test at the first service connection after the point where the water is rechlorinated, and an additional test at a location in the far reaches of the distribution system. The additional test at the location nearest the treatment plant must be conducted within two hours after detecting an elevated chlorine dioxide residual at the entry point to the distribution system. The two other tests must be conducted at six-hour to eight-hour intervals thereafter.

(4) Public water systems shall monitor the disinfectant residual at various locations throughout the distribution system.

(A) Public water systems that use groundwater or purchased water sources only and serve fewer than 250 connections and fewer than 750 people daily, must monitor the disinfectant residual at representative locations in the distribution system at least once every seven days.

(B) Public water systems that serve at least 250 connections or at least 750 people daily, and use only groundwater or purchased water sources must monitor the disinfectant residual at representative locations in the distribution system at least once per day.

(C) Public water systems using surface water sources or groundwater under the direct influence of surface water must monitor the disinfectant residual tests at least once per day at representative locations in the distribution system.

(D) All public water systems must monitor the residual disinfectant concentration each time that a bacteriological sample is collected, as specified in §290.109 of this title (relating to Microbial Contaminants).

(d) Analytical requirements. All monitoring required by this section must be conducted at a facility approved by the executive director and using methods that conform to the requirements of §290.119 of this title (relating to Analytical Procedures).

(1) The free chlorine residual must be measured to a minimum accuracy of plus or minus 0.1 mg/L using one of the following methods:

(A) Amperometric titration;

(B) N,N-diethyl-*p*-phenylenediamine (DPD) Ferrous titration;

(C) DPD colorimetric; or

(i) The free chlorine residual within the treatment plant and at the point where the treated water enters the distribution system must be measured with a colorimeter or spectrophotometer.

(ii) The free chlorine residual within the distribution system must be measured with a colorimeter, spectrophotometer, or color comparator test kit.

(D) Springaldizine (FACTS).

(2) The chloramine residual must be measured to a minimum accuracy of plus or minus 0.1 mg/L using one of the following methods:

(A) Amperometric titration;

(B) DPD Ferrous titration; or

(C) DPD colorimetric.

(i) The chloramine residual within the treatment plant and at the point where the treated water enters the distribution system must be measured with a colorimeter or spectrophotometer.

(ii) The chloramine residual within the distribution system must be measured with a colorimeter, spectrophotometer, or color comparator test kit.

(3) The chlorine dioxide residual must be measured to a minimum accuracy of plus or minus 0.05 mg/L using one of the following methods:

(A) the amperometric titration method using a titrator with platinum-platinum electrodes;

(B) the spectrophotometric Lissamine Green B method, or

(C) with the written permission of the executive director, the DPD-glycine method using a colorimeter or spectrophotometer.

(e) Reporting requirements. Any owner or operator of a public water system subject to the provisions of this section is required to report to the executive director the results of any test, measurement, or analysis required by this section.

(1) Systems exceeding the MRDL for chlorine dioxide in subsection (b)(3) of this section must report the exceedance to the executive director within 24 hours of the event.

(2) Public water systems that use surface water sources or groundwater sources under the direct influence of surface water must submit a Surface Water Monthly Operating Report (commission Form 0102C) or a Surface Water Monthly Operating Report for 2-Filter Plants (commission Form 0103) each month.

(3) Public water systems that use chlorine dioxide must submit a Chlorine Dioxide Monthly Operating Report (commission Form 0690) each month.

(4) Public water systems that use purchased water or groundwater sources only must complete a Disinfection Level Quarterly Operating Report (DLQOR, commission Form 20067) each quarter.

(A) Community and nontransient noncommunity public water systems must submit the Disinfection Level Quarterly Operating Report each quarter, by the tenth day of the month following the end of the quarter.

(B) Transient noncommunity public water systems must retain the Disinfection Level Quarterly Operating Reports and must provide a copy if requested by the executive director.

(5) Monthly and quarterly reports required by this section must be submitted to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087 by the tenth day of the month following the end of the reporting period.

(f) Compliance determinations. Compliance with the requirements of this section shall be determined using the following criteria.

(1) All samples used for compliance must be obtained at sampling sites designated in the monitoring plan.

(A) All samples collected at sites designated in the monitoring plan as microbiological and disinfectant residual monitoring sites shall be included in the compliance determination calculations.

(B) Samples collected at sites in the distribution system not designated in the monitoring plan shall not be included in the compliance determination calculations.

(2) A public water system that fails to conduct the monitoring tests required by this section commits a monitoring violation.

(3) A public water system that fails to report the results of the monitoring tests required by this section commits a reporting violation.

(4) A public water system that uses surface water sources or groundwater sources under the direct influence of surface water and fails to meet the requirements of subsection (b)(2) of this section for a period longer than four consecutive hours commits a nonacute treatment technique violation. A public water system that fails to conduct the additional testing required by subsection (c)(1)(B)(iii) of this section also commits a nonacute treatment technique violation.

(5) A public water system that uses chlorine dioxide and exceeds the level specified in subsection (b)(3) of this section violates the MRDL for chlorine dioxide.

(A) If a public water system violates the MRDL for chlorine dioxide and any of the three additional distribution samples exceeds the MRDL, the system commits an acute MRDL violation for chlorine dioxide.

(B) If a public water system violates the MRDL for chlorine dioxide and fails to collect each of the three additional distribution samples required by subsection (c)(3) of this section, the system commits an acute MRDL violation for chlorine dioxide.

(C) If a public water system violates the MRDL for chlorine dioxide but none of the three additional distribution samples violates the MRDL, the system commits a nonacute MRDL violation for chlorine dioxide.

(6) A public water system that fails to meet the requirements of subsection (b)(4) of this section, in more than 5.0% of the samples collected each month, for any two consecutive months, commits a nonacute treatment technique violation. Specifically, the system commits a nonacute violation if the value "V" in the following formula exceeds 5.0% per month for any two consecutive months:

Figure: 30 TAC §290.110(f)(6)

$$V = \frac{b \times 100}{a}$$

Where:
a = number of instances where the residual disinfectant concentration is measured during the month;
b = number of instances during the month where the residual disinfectant concentration is measured but is detected at less than 0.2 mg/L free chlorine or less than 0.5 mg/L chloramine.

(7) A public water system violates the MRDL for chlorine or chloramine if, at the end of any quarter, the running annual average of monthly averages exceeds the level specified in subsection (b)(5) of this section.

(8) Notwithstanding the MRDLs listed in subsection (b) of this section, operators shall increase residual disinfectant levels of chlorine or chloramines (but not chlorine dioxide) in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems caused by circumstances such as distribution line breaks, storm runoff events, source water contamination, or cross-connections.

(9) If a public water system's failure to monitor makes it impossible to determine compliance with the MRDL for chlorine or chloramines, the system commits an MRDL violation for the entire period covered by the annual average.

(10) A public water system that fails to issue a required public notice or certify that it has issued that notice commits a violation.

(g) Public notification requirements. The owner or operator of a public water system that violates the requirements of this section must notify the executive director and the people served by the system.

(1) A public water system that fails to meet the requirements of subsection (b)(3) of this section, shall notify the executive director within 24 hours of the event and the customers in accordance with the requirements of §290.122 of this title (relating to Public Notification).

(A) A public water system that has an acute violation of the MRDL for chlorine dioxide must notify the customers in accordance with the requirements of §290.122(a) of this title.

(B) A public water system that has a non-acute violation of the MRDL for chlorine dioxide must notify the customers in accordance with the requirements of §290.122(b) of this title.

(2) A public water system that uses surface water sources or groundwater sources under the direct influence of surface water and fails to meet the minimum disinfection requirements of

subsection (b)(2) of this section shall notify the executive director by the end of the next business day and the customers in accordance with the requirements of §290.122(b) of this title.

(3) A public water system that fails to meet the requirements of subsection (b)(4) of this section in more than 5.0% of the samples collected each month for two consecutive months must notify its customers.

(A) A public water system that uses surface water or groundwater under the direct influence of surface water must notify its customers in accordance with the requirements of §290.122(b) of this title.

(B) A public water system that uses only groundwater or purchased water must notify its customers when it issues its annual consumer confidence report.

(4) A public water system that fails to meet the requirements of subsection (b)(5) of this section shall notify the executive director by the end of the next business day and the customers in accordance with the requirements of §290.122(b) of this title.

(5) A public water system which fails to conduct the monitoring required by this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

§290.111. Surface Water Treatment.

(a) Applicability. A public water system that treats surface water or groundwater under the direct influence of surface water must comply with the requirements of this section.

(1) A public water system that treats surface water must comply with the requirements of this section beginning on the effective date of the rule.

(2) A public water system that treats groundwater under the direct influence of surface water must comply with the requirements of this section beginning on a date specified by the executive director. This compliance date shall not exceed 18 months from the date that the executive director first notifies the system that the groundwater source is under the direct influence of surface water.

(3) A public water system that treats both surface water and groundwater under the direct influence of surface water must meet the compliance date in paragraph (1) of this subsection at plants that treat any surface water and must meet the compliance date in paragraph (2) of this subsection at plants that treat only groundwater under the direct influence of surface water.

(b) Raw surface water monitoring. A public water system that treats surface water or groundwater under the direct influence of surface water must conduct two rounds of special raw surface water monitoring at each surface water intake and at each well producing groundwater under the direct influence of surface water for the purpose of establishing minimum treatment technique requirements for *Cryptosporidium* and other pathogens. The executive director may waive the raw surface water monitoring requirements for an intake or a well if the combination of pathogen removal and disinfection

processes used to treat the raw water achieves at least a 5.5-log total removal and inactivation of *Cryptosporidium parvum*.

(1) Raw water monitoring plans. A system must submit a proposed raw surface water monitoring plan when requested by the executive director. The proposed plan must identify all of the system's intakes and wells; provide the location of each raw water sampling point; include the parameters that will be monitored and the frequency and dates that samples will be collected; and specify the laboratories that will perform the analyses. Raw surface water monitoring must be conducted in accordance with a monitoring plan that has been approved by the executive director. The executive director shall not approve a raw surface water monitoring plan unless it indicates that the system will meet the requirements of 40 Code of Federal Regulations (CFR) §§141.701 – 141.707.

(2) Sampling location. A system must collect each raw water sample at a location approved by the executive director. Samples must be collected from the raw water line prior to any treatment and before the first point where a recycled stream is returned to the treatment process.

(3) Sampling parameters and frequency. A system must collect raw water samples at a frequency approved by the executive director.

(A) Unless the executive director approves an alternate sampling regimen, a system must monitor turbidity, *E. coli*, and *Cryptosporidium* levels in the raw water at least once each month for a period of not less than 24 consecutive months if the system:

(i) serves at least 10,000 people; or

(ii) is part of combined distribution system in which one or more systems serve at least 10,000 people and the system with the well or intake regularly provides water to another public water supply.

(B) A system that is not required to monitor under subparagraph (A) of this paragraph must either monitor in accordance with the requirements of subparagraph (A) of this paragraph or monitor *E. coli* levels in their raw water at least once every two weeks for a period of not less than 12 consecutive months. A system that does not initially monitor for *Cryptosporidium* and has elevated *E. coli* levels must conduct additional raw water monitoring.

(i) A system must conduct additional monitoring if the average *E. coli* level exceeds 50 colony-forming units per 100 milliliters in the raw water produced by a surface water intake located on a river or flowing stream or the raw water from a well producing groundwater under the direct influence of surface water located closest to a river or flowing stream.

(ii) A system must conduct additional monitoring if the average *E.coli* level exceeds 10 colony-forming units per 100 milliliters in the raw water from a surface water intake not located on a river or flowing stream or the raw water produced by a well producing groundwater under the direct influence of surface water not located on a river or flowing stream.

(iii) A system that must conduct additional monitoring must monitor *Cryptosporidium* levels in the raw water at least twice each month for a period of not less than 12 consecutive months, or at least once each month for a period of not less than 24 consecutive months.

(C) The executive director may approve an alternate sampling frequency for intakes and wells that operate only part of the year.

(4) Sampling schedule and dates. A system must collect raw water samples in accordance with a schedule approved by the executive director.

(A) Except as provided in paragraph (B), a system must begin each round of raw source water monitoring no later than the date shown in the following table titled "Raw Source Water Monitoring Schedule."

Figure: 30 TAC §290.111(b)(4)(A)

Raw Source Water Monitoring Schedule

Systems that are not part of a combined distribution system[(1)] and serve . . .	must begin the first round of source water monitoring no later than the month beginning . . .	and must begin the second round of source water monitoring no later than the month beginning . . .
At least 100,000 people	October 1, 2006	April 1, 2015
From 50,000 to 99,999 people	April 1, 2007	October 1, 2015
From 10,000 to 49,999 people	April 1, 2008	October 1, 2016
Fewer than 10,000 people and monitor for *E. coli*	October 1, 2008	October 1, 2017
Fewer than 10,000 and monitor for *Cryptosporidium*	April 1, 2010	April1, 2019
[(1)] Systems that provide treated surface water to another system and are part of a combined distribution system must begin monitoring at the same time as the system in the combined distribution system that has the earliest compliance date.		

(B) If a system installs a new well or intake after the date the first round of raw source water monitoring must begin, the system must submit a proposed monitoring schedule for the first round of special raw surface water monitoring no later than three months after first placing the new source in operation.

(C) A system must collect a raw water sample no sooner than two days before the date approved by the executive director and no later than two days after the approved date, unless an extreme condition or situation exists that poses a danger to the sample collector.

(D) A system which is unable to collect a sample within this five-day period must collect the sample as close as possible to the approved date and must notify the executive director in writing why the sample was not collected on the approved date.

(5) Replacement samples. If, for any reason, the laboratory is unable to report a valid analytical result for a scheduled sample, the system must submit a replacement sample on a date approved by the executive director.

(6) Analytical requirements. Raw water samples collected pursuant to this subsection must be analyzed at an approved or certified laboratory.

(A) *Cryptosporidium* samples must be analyzed using one of the methods approved in Title 40 Code of Federal Regulations (CFR) §141.704(a) and by a laboratory that is approved under Environmental Protection Agency's (EPA) Laboratory Quality Assurance Evaluation Program for Analysis of *Cryptosporidium* in Water.

(B) *E. coli* samples must be analyzed using one of the methods approved in 40 CFR §136.3(a) for the enumeration of *E. coli* in source water and by a laboratory that is certified or accredited by the executive director.

(i) Systems must ensure that samples are maintained between 0°C and 10°C during storage and transportation to the laboratory.

(ii) The time between sample collection and the initiation of the analysis may not exceed 30 hours without the prior approval of the executive director.

(iii) The executive director may allow up to 48 hours between sample collection and the initiation of the analysis if the analysis is conducted by the Colilert reagent version of Standard Method 9223B.

(C) Turbidity samples must be analyzed using a method and at a laboratory approved by the executive director.

(7) Reporting requirements for raw surface water sample results. The owner or operator of a public water system must provide to the executive director with a copy of the results of any test, measurement, or analysis required by this subsection.

(A) Results must be submitted using the Raw Surface Water Sampling Report (commission Form 20358) or in another format that is approved by the executive director and contains the information required by 40 CFR §141.706(e).

(i) If the sample was not collected within the 5-day window described in paragraph (4)(A) of this subsection, the result must be accompanied by the information required in paragraph (4)(B) of this subsection.

(ii) If the laboratory report indicates that a valid analytical result could not be reported, the laboratory report must be accompanied by a request to collect a replacement sample.

(B) The results must be submitted within ten days of their receipt by the public water system and no later than 10 days after the end of the first month following the month that the sample was collected.

(C) The results and any additional information must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(c) Treatment technique requirements. A system that treats surface water or groundwater under the direct influence of surface water must meet minimum treatment technique requirements before the water reaches the entry point to the distribution system.

(1) The combination of pathogen removal and disinfection processes used by a public water system must achieve at least a 4.0-log removal/inactivation of viruses.

(2) The combination of pathogen removal and disinfection processes used by a public water system must achieve at least a 3.0-log removal/inactivation of *Giardia lamblia*.

(3) A public water system that is required by subsection (b) of this section to conduct raw surface water monitoring must comply with the requirements of this paragraph.

(A) The average *Cryptosporidium* level and Bin Classification shall be determined in accordance with the requirements established by 40 CFR §141.710.

(i) For systems that collect a total of at least 48 *Cryptosporidium* samples, the average concentration is equal to the arithmetic mean of all sample concentrations.

(ii) For systems that collect a total of at least 24 samples, but not more than 47 *Cryptosporidium* samples, the average concentration is equal to the highest arithmetic mean of all sample concentrations in any 12 consecutive months during which *Cryptosporidium* samples were collected.

(iii) For systems that serve fewer than 10,000 people and monitor for *Cryptosporidium* for only one year (i.e., collect 24 samples in 12 months), the average concentration is equal to the arithmetic mean of all sample concentrations.

(iv) For systems with plants operating only part of the year that monitor fewer than 12 months per year under 40 CFR §141.701(e), the bin concentration is equal to the highest arithmetic mean of all sample concentrations during any year of *Cryptosporidium* monitoring.

(v) If the monthly *Cryptosporidium* sampling frequency varies, systems must first calculate a monthly average for each month of monitoring. Systems must then use these monthly average concentrations, rather than individual sample concentrations, in the applicable calculation for bin classification in paragraphs.

(B) Unless otherwise specified in this paragraph, the combination of pathogen removal and disinfection processes must achieve the removal/inactivation of *Cryptosporidium parvum* specified in the following table titled "Treatment Technique Requirements for *Cryptosporidium*," beginning 36 months after being assigned a Bin Classification by the executive director.

Figure: 30 TAC §290.111(c)(3)(B)

Treatment Technique Requirements for *Cryptosporidium* [(1)]

Average *Cryptosporidium* Level in the Raw Water	Bin Classification	Minimum Removal/Inactivation Requirement
Cryptosporidium < 0.075 oocyst/L	in 1	.0-log
0.075 oocysts/L ≤ *Cryptosporidium* < 1.0 ocysts/L	in 2	.0-log
1.0 oocysts/L ≤ *Cryptosporidium* < 3.0 oocysts/L	in 3	.0-log
Cryptosporidium ≥ 3.0 oocysts/L	in 4	.5-log

[1]The executive director will assign *Cryptosporidium* removal credit based on the treatment processes used at the plant:

a) Treatment plants utilizing coagulation, flocculation, and granular media filtration will receive a 2.5-log *Cryptosporidium* removal credit.

b) Treatment plants utilizing coagulation, flocculation, and granular media filtration will receive a 3.0-log *Cryptosporidium* removal credit.

c) The executive director will assign *Cryptosporidium* removal credit to treatment plants utilizing bag, cartridge, or membrane filters on an individual basis.

(i) A system that conducts the first round of special raw surface water monitoring according to the schedule contained in §291.114(b)(4)(A) of this title must comply with the requirements of this paragraph no later than the date shown in the following table, titled "Compliance Date for Existing Sources."

Figure: 30 TAC §290.111(c)(3)(B)(i)

Compliance Date for Existing Sources

A system that serves . . .	Must comply with the requirements of this paragraph no later than . . .
At least 100,000 people	April 1, 2012
From 50,000 to 99,999 people	October 1, 2012
From 10,000 to 49,999 people	October 1, 2013
Fewer than 10,000 people	October 1, 2014

(ii) A system that conducts the first round of special raw surface water monitoring according to the schedule contained in §291.114(b)(4)(B) of this title must comply with the requirements of this paragraph no later than six years after beginning the first round of monitoring on the new source.

(iii) The executive director may allow a system making capital improvements an additional two years to comply with the treatment requirement of this paragraph.

(C) A system that has been assigned to Bin 3 or Bin 4 must achieve at least 1.0-log removal/inactivation of *Cryptosporidium* using one or a combination of the following: bag filters, cartridge filters, chlorine dioxide, membranes, ozone, or ultraviolet light.

(D) Prior to the effective date of subparagraph (B) of this paragraph, the combination of disinfection and filtration processes used by a public water system to treat for *Cryptosporidium* must achieve at least a 2.0-log removal/inactivation of *Cryptosporidium parvum*.

(4) The combination of disinfection and filtration processes at plants that do not monitor each source in accordance with the requirements of subsection (b) of this section must achieve at least a 5.5-log removal /inactivation of *Cryptosporidium parvum.*

(5) The executive director may require additional levels of treatment in cases of poor source water quality.

(6) The executive director may establish minimum design, operational, and reporting requirements for watershed control programs and treatment processes used to meet the treatment technique requirements of this subsection.

(d) Microbial inactivation requirements. A system that treats surface water or groundwater under the direct influence of surface water must meet minimum disinfection requirements before the water is supplied to any consumer.

(1) Inactivation table. The disinfection process must achieve the minimum microbial inactivation levels shown in the following table.

Figure: 30 TAC §290.111(d)(1)

Microbial Inactivation Requirements

	Filter Technology Used			
	Conventional Filters [1]		Membrane Filters and Cartridge Filters [2]	
Pretreatment Provided	*Giardia*	Virus	*Giardia*	Virus
No coagulation	NA	NA	0.0-log[3]	4.0-log
Coagulation and flocculation	1.0-log	3.0-log	0.0-log	3.0-log
Coagulation, flocculation, and clarification	0.5-log	2.0-log	0.0-log	2.0-log

1 Filters in which water passes through a porous granular media and which utilize depth filtration processes.
2 Filters in which particulate matter larger than 1 micrometer is rejected by an engineered barrier, primarily through a size-exclusion mechanism.
3 The executive director will determine the required *Giardia* inactivation on a case-by-case basis.

(A) The disinfection process at treatment plants not described in the Microbial Inactivation Requirements table must provide the level of disinfection required by the executive director.

(B) The executive director may require additional levels of treatment in cases of poor source water quality.

(C) The executive director may reduce the inactivation requirement for plants that meet the individual filter effluent performance criteria contained in subsection (g)(1) of this section and have been assigned a Bin 1 classification under the provisions of subsection (c)(3) of this section.

(D) A system that fails to meet the inactivation requirements of this section for a period of longer than four consecutive hours commits a nonacute treatment technique violation. A system that fails to conduct the additional testing required by subsection (d)(2)(C) of this section also commits a nonacute treatment technique violation.

(E) A system that has a plant assigned a Bin 2, 3, or 4 classification under the provisions of subsection (c)(3) of this section and uses ultraviolet light (UV) disinfection facilities to meet the treatment technique requirements for *Cryptosporidium* must meet the inactivation requirements of this subsection in at least 95% of the water treated each month.

(2) Monitoring requirements for chemical disinfectants. Public water systems must monitor the performance of the disinfection facilities to ensure that appropriate disinfectant levels are maintained. All monitoring conducted pursuant to the requirements of this subsection must be conducted at sites designated in the public water system's monitoring plan.

(A) The disinfectant residual, pH, temperature, and flow rate of the water in each disinfection zone must be measured at least once each day during a time when peak hourly raw water flow rates are occurring.

(B) Disinfection contact time will be based on tracer study data or a theoretical analysis submitted by the system owner or their designated agent and approved by the executive director and the actual flow rate that is occurring at the time that monitoring occurs.

(C) Treatment plants that fail to demonstrate an appropriate level of treatment must repeat these tests at four-hour or shorter intervals until compliance has been reestablished.

(3) Monitoring requirements for UV disinfection facilities. Public water systems must monitor the performance of the UV disinfection facilities.

(A) A system must continuously monitor and record UV intensity as measured by a UV sensor, lamp status, the flow rate through the unit, and other parameters prescribed by the executive director to ensure that the units are operating within validated conditions.

(B) A system with a plant that has been assigned a Bin 2, 3, or 4 classification under the provisions of subsection (c)(3) of this section must also monitor and record the amount of water treated by each UV unit each month and the amount of water produced each month when the unit was not operating within validated conditions.

(4) Analytical requirements. All monitoring required by this subsection must be conducted at a facility approved by the executive director and using methods that conform to the requirements of §290.119 of this title (relating to Analytical Procedures).

(A) The pH analysis must be conducted using a pH meter with a minimum accuracy of plus or minus 0.1 pH units.

(B) The temperature of the water must be measured using a thermometer or thermocouple with a minimum accuracy of plus or minus 0.5 degrees Celsius.

(C) The free chlorine residual must be measured to a minimum accuracy of plus or minus 0.1 milligrams per liter (mg/L) using one of the following methods:

(i) Amperometric titration;

(ii) DPD Ferrous titration;

(iii) a DPD method that uses a colorimeter or spectrophotometer; or

(iv) Springaldizine (FACTS).

(D) The chloramine residual must be measured to a minimum accuracy of plus or minus 0.1 mg/L using one of the following methods:

(i) Amperometric titration;

(ii) DPD Ferrous titration; or

(iii) a DPD method that uses a colorimeter or spectrophotometer.

(E) The chlorine dioxide residual must be measured to a minimum accuracy of plus or minus 0.05 mg/L using one of the following methods:

(i) Amperometric titrator with platinum-platinum electrodes; or

(ii) Lissamine Green B.

(F) The ozone residual must be measured to a minimum accuracy of plus or minus 0.05 mg/L using the Indigo Method and using a colorimeter or spectrophotometer.

(G) The UV dose must be measured by a calibrated sensor approved by the executive director.

(e) Filtration requirements for conventional filters. A system that uses granular media filters to treat surface water or groundwater under the direct influence of surface water must meet minimum filtration requirements before the water is supplied to any consumer.

(1) Treatment technique requirements for combined filter effluent. Treatment plants using conventional media filtration must meet the following turbidity requirements.

(A) The turbidity level of the combined filter effluent must never exceed 1.0 nephelometric turbidity unit (NTU).

(B) The turbidity level of the combined filter effluent must be 0.3 NTU or less in at least 95% of the samples tested each month.

(2) Performance criteria for individual filter effluent. The filtration techniques must ensure the public water system meets the following performance criteria.

(A) The turbidity from each individual filter effluent should never exceed 1.0 NTU.

(B) At a public water system that serves 10,000 people or more, the turbidity from each individual filter effluent should not exceed 0.5 NTU at four hours after the individual filter is returned to service after backwash or shutdown.

(3) Routine turbidity monitoring requirements. A system must monitor the performance of its filtration facilities.

(A) A system that serves fewer than 500 people and continuously monitors the turbidity level of each individual filter must measure and record the turbidity level of the combined filter effluent at least once each day that the plant is in operation.

(B) A system that serves at least 500 people and continuously monitors the turbidity level of each individual filter must measure and record the turbidity level of the combined filter effluent at least every four hours that the system serves water to the public.

(C) Except as provided in subparagraph (D) of this paragraph, a system must continuously monitor the filtered water turbidity at the effluent of each individual filter and record the turbidity value every 15 minutes.

(D) A system that serves fewer than 10,000 people and monitors combined filter effluent turbidity in lieu of individual filter effluent turbidity under the provisions of §290.42(d)(11)(E)(ii) of this title (relating to Water Treatment) must:

(i) continuously monitor the turbidity of the combined filter effluent and record the turbidity value every 15 minutes; and

(ii) measure and record the turbidity level at the effluent of each filter at least once each day the plant is in operation.

(4) Special investigation requirements. A system which fails to produce water with acceptable turbidity levels must investigate the cause of the problem and take appropriate corrective action. The executive director can waive these special monitoring requirements for systems that have a corrective action schedule approved by the executive director.

(A) A public water system that fails to meet the turbidity criteria specified in subsection (e)(2) of this section must conduct additional monitoring.

(i) Each time a filter exceeds an applicable filtered water turbidity level specified in subsection (e)(2) of this section for two consecutive 15-minute readings, the public water system must either identify the cause of the exceedance or produce a filter profile on the filter within seven days of the exceedance.

(ii) Each time a filter exceeds the filtered turbidity level specified in subsection (e)(2)(A) of this section for two consecutive 15-minute readings on three separate occasions during any consecutive three-month period, the public water system must conduct a filter assessment on the filter within 14 days of the third exceedance.

(iii) Each time the filtered water turbidity level for a specific filter or any combination of individual filters exceeds 2.0 NTU on two consecutive 15-minute readings during two consecutive months, the public water system must participate in a third-party comprehensive performance evaluation (CPE). If the system serves at least 10,000 people, the CPE must be conducted within 90 days of the first exceedance in the second month. If the system serves fewer than 10,000 people, the CPE must be conducted within 120 days of the first exceedance in the second month.

(B) A system that serves fewer than 10,000 people, monitors combined filter effluent turbidity in lieu of individual filter effluent turbidity, and fails to meet the turbidity criteria in subsection (e)(1)(A) of this section must conduct additional monitoring. The executive director may waive these special monitoring requirements for systems that have a corrective action schedule approved by the executive director.

(i) Each time the combined filter effluent turbidity level exceeds 1.0 NTU for two consecutive 15-minute readings, the public water system must either identify the cause of the exceedance or complete a filter profile on the combined filter effluent within seven days of the exceedance.

(ii) Each time the combined filter effluent turbidity level exceeds 1.0 NTU for two consecutive 15-minute readings on three separate occasions during any consecutive three-month period, the public water system must conduct a filter assessment on each filter within 14 days of the third exceedance.

(iii) Each time the combined filter effluent turbidity level exceeds 2.0 NTU on two consecutive 15-minute readings during two consecutive months, the public water system must participate in a third-party comprehensive performance evaluation within 120 days of the first exceedance in the second month.

(5) Analytical requirements for turbidity. All monitoring required by this subsection must be conducted by a facility approved by the executive director and using methods that conform to the requirements of §290.119 of this title (relating to Analytical Procedures). Equipment used for compliance measurements must be maintained and calibrated in accordance with §290.46(s) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems).

(A) Turbidity must be measured with turbidimeters that use one of the following methods:

(i) EPA Method 180.1 and Standard Method 2130B;

(ii) Great Lakes Instruments Method 2; or

(iii) Hach FilterTrak Method 10133.

(B) A system monitoring the performance of individual filters with on-line turbidimeters and recorders may monitor combined filter effluent turbidity levels by either continuously monitoring turbidity levels with an on-line turbidimeter or measuring the turbidity level in grab samples with a bench-top turbidimeter.

(C) Continuous turbidity monitoring must be conducted using a continuous, on-line turbidimeter and a device that records the turbidity level reading at least once every 15 minutes.

(i) Turbidity data may be recorded electronically by a supervisory control and data acquisition system (SCADA) or on a strip chart. The recorder must be designed so that the operator can accurately determine the turbidity level readings at 15-minute intervals.

(ii) If there is a failure in the continuous turbidity monitoring equipment at a system serving 10,000 people or more, the system must conduct grab sampling every four hours in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment.

(iii) If the continuous turbidity monitoring equipment at a system serving fewer than 10,000 people malfunctions, the system must conduct grab sampling every four hours in lieu of continuous monitoring, but for no more than 14 working days following the failure of the equipment.

(D) A system that monitors combined filter effluent turbidity in lieu of individual filter effluent turbidity under §290.42(d)(11)(E)(ii) of this title must monitor the performance of individual filters using a bench-top turbidimeter.

(f) Filtration requirements for other filters. A system that uses cartridge filters, membrane filters, or other unconventional filtration systems to treat surface water or groundwater under the direct influence of surface water must meet minimum filtration requirements before the water is supplied to any consumer.

(1) Treatment technique requirements. A system that uses unconventional filtration technologies such as membrane filters or cartridge filters must meet treatment technique requirements prescribed by the executive director.

(A) The filtration facilities must meet turbidity limits established by the executive director.

(B) The filtration facilities must be operated and maintained in accordance with requirements that the executive director determines are needed to demonstrate the amount of *Giardia* and *Cryptosporidium* removal achieved.

(2) Monitoring requirements. A system must monitor the performance of its filtration facilities.

(A) A system that serves fewer than 500 people and continuously monitors the turbidity level of each individual cartridge or membrane unit must measure and record the turbidity level of the combined effluent at least once each day that the plant is in operation.

(B) A system that serves at least 500 people and continuously monitors the turbidity level of each individual cartridge or membrane unit must measure and record the turbidity level of the combined effluent at least every four hours that the system serves water to the public.

(C) A system using membranes must use a method approved by the executive director to continuously monitor the quality of the water produced by each membrane unit and record the monitoring results at least once every five minutes. The executive director may approve monitoring parameters other than turbidity and decrease the frequency to once every 15 minutes if the approved operating parameters will allow consecutive readings to be obtained between backwash or backflush cycles.

(D) A system using membranes must conduct direct integrity testing on each membrane unit using a procedure approved by the executive director.

(i) Direct integrity tests must be conducted in a manner that will detect a membrane defect of 3 microns or smaller and demonstrates a removal efficiency equal to or greater than the removal credit awarded to the membrane filtration process by the executive director.

(ii) Direct integrity test method must calculate the log removal value for a 3-micron size particle and establish an upper control limit which assures that the unit is capable of meeting the removal credit approved by the executive director.

(iii) A system that has been assigned a Bin 1 classification under the provisions of subsection (c)(3)(B) of this section must conduct direct integrity tests at least once every seven days. The executive directed may reduce the testing requirements for other membrane units.

(iv) A system that has been assigned a Bin 2, 3, or 4 classification under the provisions of subsection (c)(3)(B) of this section must conduct direct integrity tests at least once each day that the membrane unit is used for filtration. The executive director may approve less frequent testing, based on demonstrated process reliability, the use of multiple barriers effective for *Cryptosporidium* removal or inactivation, or reliable process safeguards.

(v) A system must immediately conduct a direct integrity test on any membrane unit that produces filtered water with turbidity level above 0.15 NTU on two consecutive

readings. The executive director must establish alternate site-specific control limits for systems that use other approved technology in lieu of turbidimeters to continuously monitor the performance of membrane units.

(vi) A system must immediately remove any membrane unit that fails a direct integrity test from service until the membrane modules in that unit are inspected and, if necessary, repaired. A membrane unit that has been removed from service may not be returned to service until it has passed a direct integrity test.

(E) A system that uses cartridge filters must continuously monitor the performance of the filtration process in a manner approved by the executive director.

(3) Analytical requirements. All monitoring required by this subsection must be conducted by a facility approved by the executive director and using methods that conform to the requirements of §290.119 of this title. Equipment used for compliance measurements must be maintained and calibrated in accordance with §290.46(s) of this title.

(A) Turbidity of the combined effluent must be measured with turbidimeters that meet the requirements of subsection (e)(5)(A) of this section.

(B) The turbidity of the water produced by each membrane unit must be measured using the Hach FilterTrak Method 10133. The executive director may approve the use of alternative technology to monitor the quality of the water produced by each membrane unit.

(C) A system continuously monitoring the performance of individual cartridges or membrane units may monitor combined effluent turbidity levels by either continuously monitoring turbidity levels with an on-line turbidimeter, or by measuring the turbidity level in grab samples with a bench-top turbidimeter.

(D) Data collected from on-line instruments may be recorded electronically by a SCADA system or on a strip chart recorder. The recorder must be designed so that the operator can accurately determine the value of readings at the monitoring interval approved by the executive director.

(i) If there is a failure in the continuous monitoring equipment at a system serving 10,000 people or more, the system must conduct grab sampling every four hours in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment.

(ii) If there is a failure in the continuous monitoring equipment at a system serving fewer than 10,000 people, the system must conduct grab sampling every four hours in lieu of continuous monitoring, but for no more than 14 working days following the failure of the equipment.

(E) A system that uses cartridge filters and does not continuously monitor the turbidity of each filter unit must monitor the performance of individual filters at least once each day using a bench-top turbidimeter.

(g) Other treatment credits for systems in Bins 2 through 4. The executive director may grant additional pathogen removal and inactivation credit to systems that meet enhanced design, operational, maintenance, and reporting requirements.

(1) Individual filter effluent. The executive director may approve an additional 1.0-log removal credit for *Giardia* and *Cryptosporidium* to a treatment plant that uses conventional granular media filters.

(A) The executive director will approve the additional credit for a plant if:

(i) the system continuously monitored the filtered water turbidity at the effluent of each individual filter and recorded the turbidity value every 15 minutes that the filter was sending water to the clearwell;

(ii) the turbidity level at each individual filter effluent is less than or equal to 0.15 NTU in at least 95% of the measurements recorded during the month; and

(iii) no individual filter produced water with turbidity level above 0.3 NTU in two consecutive 15-minute readings.

(B) The executive director may also approve the additional credit for a plant that does not meet the requirements of subparagraph (A) of this paragraph if:

(i) the executive director determines that the failure to meet the requirements of subparagraph (A) of this paragraph could not have been prevented through optimizing plant operations, design, or maintenance; and

(ii) the system has experienced no more than two such failures within the most recent 12 months.

(2) Combined filter effluent. The executive director may approve an additional 0.5-log removal credit for *Cryptosporidium* to a treatment plant that uses conventional granular media filters if:

(A) the system continuously monitored the filtered water turbidity at the effluent of each individual filter and recorded the turbidity value every 15 minutes that the filter was sending water to the clearwell;

(B) the turbidity level at the combined filter effluent is less than or equal to 0.15 NTU in at least 95% of the measurements recorded during the month; and

(C) the plant does not receive additional treatment credit under paragraph (1) of this subsection.

(3) Second stage filtration. The executive director will approve an additional 0.5-log removal credit for *Giardia* and *Cryptosporidium* to a treatment plant that uses a second, separate stage of conventional granular media filters if:

(A) the filters in both stages meet minimum design criteria approved by the executive director;

(B) all of the water produced by the plant passes through both stages of filtration;

(C) the system continuously monitored the filtered water turbidity at the effluent of each individual filter in the first stage of filtration and recorded the turbidity value every 15 minutes that the filter was sending water to the clearwell; and

(D) no individual filter in the first stage of filtration produced water with turbidity level above 1.0 NTU in two consecutive 15-minute readings.

(4) Other pathogen control strategies. The executive director may approve an additional removal or inactivation credit for other pre-filtration, filtration, or post-filtration strategies that can demonstrate effective, consistent levels of enhanced pathogen control.

(A) The alternative strategy must achieve a quantifiable reduction in the risk of waterborne disease in all of the treated water produced by the plant.

(B) The alternative strategy must conform to any applicable requirement of 40 CFR §§141.715 – 141.720.

(C) The executive director may establish minimum site-specific design, operational, maintenance, and reporting requirements for any alternative strategy used to meet minimum treatment technique requirements of subsection (c) of this section.

(D) The executive director may not approve additional removal credit under the provisions of this paragraph to any strategy that includes a treatment process has been assigned additional removal or inactivation credit under any other provision of this subsection.

(h) Reporting requirements. Public water systems must properly complete and submit periodic reports to demonstrate compliance with this section.

(1) A system that has a turbidity level exceeding 1.0 NTU in the combined filter effluent must consult with the executive director within 24 hours.

(2) A system that continuously monitors the performance of individual filters must submit a Surface Water Monthly Operating Report (commission Form 0102C) each month for each plant that treats surface water sources or groundwater sources under the direct influence of surface water.

(3) A system that monitors combined filter effluent turbidity in lieu of individual filter effluent turbidity under §290.42(d)(11)(E)(ii) of this title must submit a Surface Water Monthly Operating Report for 2-Filter Plants (commission Form 0103) each month for each plant that treats surface water or groundwater under the direct influence of surface water.

(4) A system that must complete the additional monitoring required by subsection (e)(4)(A)(i) or (e)(4)(B)(i) of this section must submit a Filter Profile Report for Individual Filters (commission Form 10276) with its Surface Water Monthly Operating Report.

(5) A system that must complete the additional monitoring required by subsection (e)(4)(A)(ii) or (e)(4)(B)(ii) of this section must submit a Filter Assessment Report for Individual Filters (commission Form 10277) with its Surface Water Monthly Operating Report.

(6) A system that must complete the additional monitoring required by subsection (e)(4)(A)(iii) or (e)(4)(B)(iii) of this section must submit a Comprehensive Performance Evaluation Request Form (commission Form 10278) with its Surface Water Monthly Operating Report.

(7) A system that uses membranes must submit a Membrane Monthly Operating Report (commission Form 20356) for each plant that treats surface water or groundwater under the direct influence of surface water. The report must accompany the plant's Surface Water Monthly Operating Report.

(8) A system that uses UV disinfection to meet the minimum treatment technique requirements for surface water or groundwater under the direct influence of surface water must submit a UV Monthly Operating Report (commission Form 20357) with its Surface Water Monthly Operating Report. The report must accompany the plant's Surface Water Monthly Operating Report.

(9) A system must submit any additional reports required by the executive director to verify the level of pathogen removal or inactivation achieved by the system's treatment plants.

(10) A system must submit its *Cryptosporidium* bin classification.

(11) Periodic reports required by this section must be submitted to the Water Supply Division, Texas Commission on Environmental Quality, MC 155, P.O. Box 13087, Austin, Texas 78711-3087 by the tenth day of the month following the end of the reporting period.

(i) Compliance determination. Compliance with the requirements of this section must be determined using the criteria of this subsection.

(1) A public water system that fails to complete source water monitoring or conduct the routine monitoring tests and any applicable special investigations required by this section commits a monitoring violation.

(2) A public water system that fails to submit a report required by subsection (h) of this section commits a reporting violation.

(3) A public water system using conventional filters that has a turbidity level exceeding 5.0 NTU in the combined filter effluent commits an acute treatment technique violation.

(4) A public water system using membrane filters that has a turbidity level exceeding 1.0 NTU in the combined filter effluent commits an acute treatment technique violation.

(5) Except as provided in paragraphs (3) and (4) of this subsection, a public water system that violates the requirements of subsections (c), (d)(1), (e)(1), and (f)(1) of this section commits a nonacute treatment technique violation.

(6) A system that fails to request a Bin Classification within six months of completing a round of source water monitoring commits a treatment technique violation.

(7) A system that fails to correct the performance-limiting factors identified in a comprehensive performance evaluation conducted under the requirements of subsection (e)(4)(A)(iii) or (e)(4)(B)(iii) of this section commits a violation.

(8) A system that fails to properly issue a public notice required by subsection (j) of this section commits a violation.

(j) Public notification. The owner or operator of a public water system that violates the requirements of this section must notify the executive director and the people served by the system.

(1) A public water system that commits an acute treatment technique violation must notify the executive director and the water system customers of the acute violation within 24 hours in

accordance with the requirements of §290.46(q) of this title and §290.122(a) of this title (relating to Public Notification).

(2) A public water system that has a turbidity level exceeding 1.0 NTU in the combined filter effluent must consult with the executive director within 24 hours of the violation.

(A) Based on the results of the consultation, the executive director will determine whether the water system must notify its customers in accordance with the requirements of §290.122(a) or (b) of this title.

(B) A water system that fails to consult with the executive director as required by this paragraph must notify its customers in accordance with the requirements of §290.122(a) of this title.

(3) Except as provided in paragraphs (1) and (2) of this subsection, a public water system that fails to meet the treatment technique requirements of subsections (c),(d)(1), (e)(1), or (f)(1) must notify the executive director by the end of the next business day and the water system customers in accordance with the requirements of §290.122(b) of this title.

(4) A public water system that fails to conduct the monitoring required by this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

§290.112. Total Organic Carbon (TOC).

(a) Applicability. All community and nontransient, noncommunity public water systems that treat surface water or groundwater under the direct influence of surface water and use sedimentation or clarification facilities as part of the treatment process must meet the provisions of this section.

(b) Treatment technique. Systems must achieve the Step 1 removal requirements in paragraph (1) of this subsection, meet one of the alternative compliance criteria described in paragraph (2) of this subsection, or apply for the alternative Step 2 removal requirements described in paragraph (3) of this subsection.

(1) Systems must determine their ability to meet the Step 1 removal requirements given in the following table. A water treatment plant's Step 1 total organic carbon (TOC) required percent removal is based upon plant's source water TOC and alkalinity. Step 1 TOC percent removal requirements are indicated in the following table. Systems practicing softening are evaluated based on the Step 1 TOC removal in the far-right column (Source water alkalinity >120 milligrams per liter (mg/L)) for the specified source water TOC.

Figure: 30 TAC §290.112(b)(1)

Step 1 TOC Removal Requirement

Source-water TOC (mg/L)	Source-water alkalinity (mg/L as $CaCO_3$) Less than or Equal to…		
	0 – 60	≥ 60 to 120	≥ 120
≥ 2.0 to 4.0	35.0% Removal	25.0% Removal	15.0% Removal
≥ 4.0 to 8.0	45.0% Removal	35.0% Removal	25.0% Removal
≥ 8.0	50.0% Removal	40.0% Removal	30.0% Removal

(2) Systems may determine their ability to meet one of the eight alternative compliance criteria listed in this paragraph.

(A) A system meets alternative compliance criteria Number 1 if the system's source water TOC level is less than 2.0 mg/L, calculated quarterly as a running annual average.

(B) A system meets alternative compliance criteria Number 2 if the system's treated water TOC level is less than 2.0 mg/L, calculated quarterly as a running annual average.

(C) A system meets alternative compliance criteria Number 3 if: the system's source water TOC level is less than 4.0 mg/L, calculated quarterly as a running annual average; the source water alkalinity is greater than 60 mg/L (as calcium carbonate (CaCO3), calculated quarterly as a running annual average; and the total trihalomethanes (TTHM) and haloacetic acid-group of five (HAA5) running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively.

(D) The system meets alternative compliance criteria Number 4 if the TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively, and the system uses only chlorine for primary disinfection and maintenance of a residual in the distribution system.

(E) The system meets alternative compliance criteria Number 5 if the system's source water specific ultraviolet absorbance (SUVA), prior to any treatment, measured monthly, is less

than or equal to 2.0 liters per milligram-meter (L/mg-m), calculated quarterly as a running annual average.

(F) The system meets alternative compliance criteria Number 6 if the system's finished water SUVA, measured monthly at a point prior to any disinfection, is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

(G) The system meets alternative compliance criteria Number 7 if the system practices softening, cannot achieve the Step 1 TOC removals required by paragraph (1) of this subsection, and has treated water alkalinity less than 60 mg/L (as CaCO3) and calculated quarterly as a running annual average.

(H) The system meets alternative compliance criteria Number 8 if the system practices softening, cannot achieve the Step 1 TOC removals required by paragraph (1) of this subsection, and has magnesium hardness removal greater than or equal to 10 mg/L (as CaCO3), measured monthly calculated quarterly as a running annual average.

(3) If a system fails to meet the Step 1 TOC removal requirement required by paragraph (1) of this subsection and does not meet one of eight alternative compliance criteria described in paragraph (2) of this subsection, the system must apply to the executive director for approval of Step 2 removal requirements.

(A) The plant must perform Step 2 jar testing to determine the coagulant dose at which the removal of TOC is less than 0.3 mg/L for an increase in coagulant of 10 mg/L alum or its equivalent. This dose is referred to as the point of diminishing returns (PODR).

(B) The system must submit the results of the Step 2 jar testing to the executive director for approval of the alternative removal requirements at least 15 days before the end of the applicable quarter.

(C) The executive director may approve Step 2 alternative removal requirements.

(i) If approved, the removal achieved at the PODR becomes the alternative full-scale TOC removal requirement for the plant.

(ii) The alternate removal requirements may be applied to the quarter in which the jar test results are received and for the following quarter.

(c) TOC monitoring requirements. Systems must conduct required TOC monitoring during normal operating conditions at sites and at the frequency designated in the system's monitoring plan.

(1) Systems must monitor for TOC and alkalinity in the source water prior to any treatment. Between one and eight hours after taking the source water sample, systems must measure each treatment plant TOC after filtration in the combined filter effluent stream. These samples (source water alkalinity, source water TOC, and treated water TOC) are referred to as a TOC sample set.

(2) Systems must take one TOC sample set monthly (every 30 days) at a time representative of normal operating conditions and influent water quality.

(A) Systems with a running annual average treated water TOC of less than 2.0 mg/L for two consecutive years may reduce monitoring to one TOC sample set per plant per quarter (every 90 days). The system must revert to routine monitoring in the month following the quarter when the running annual average treated water TOC is greater than or equal to 2.0 mg/L.

(B) Systems with a running annual average treated water TOC of less than 1.0 mg/L for one year may reduce monitoring to one TOC sample set per plant per quarter (every 90 days). The system must revert to routine monitoring in the month following the quarter when the running annual average treated water TOC is greater than or equal to 2.0 mg/L.

(C) Systems with a running annual average source water TOC of less than or equal to 4.0 mg/L based on the running annual average of the most recent four quarters of monitoring may reduce TOC monitoring to one TOC sample set per quarter (every 90 days) if they also meet criteria for reduced disinfection by-product monitoring. In order to remain on quarterly TOC monitoring, the system must also meet the criteria for reduced trihalomethane and haloacetic acid monitoring given in §290.113(c)(4) of this title (relating to Stage 1 Disinfection By-products (Trihalomethanes and Haloacetic Acids)) until the date shown in table §290.113(a)(2) of this title. After the date shown in §290.115(a)(2) of this title (relating to Stage 2 Disinfection By-products (Trihalomethanes and Haloacetic Acids)), the system must also meet the criteria for reduced trihalomethane and haloacetic acid monitoring in

§290.115(c)(3) of this title in order to remain on quarterly TOC monitoring. The system must revert to routine monitoring in the first month following the quarter when the running annual average source water TOC is greater than 4.0 mg/L, or the system no longer meets the reduced monitoring criteria for disinfection by-products.

(3) A public water system attempting to meet the treatment technique requirements for TOC using alternative compliance criteria Number 5 (as defined in subsection (b)(2)(E) of this section) must monitor for SUVA in the source water prior to any treatment at least once each month.

(4) A public water system attempting to meet the treatment technique requirements for TOC using alternative compliance criteria Number 7 (as defined in subsection (b)(2)(G) of this section) must monitor for alkalinity in the treated water at any point prior to distribution system at least once each month.

(5) A public water system attempting to meet the treatment technique requirements for TOC using alternative compliance criteria Number 8 (as defined in subsection (b)(2)(H) of this section) must monitor for magnesium in both the source water prior to any treatment at and the treated water at any point prior to the distribution system least once each month.

(d) Analytical requirements for TOC treatment. Analytical procedures required by this section must be conducted at a facility approved by the executive director and using methods that conform to the requirements of §290.119 of this title (relating to Analytical Procedures).

(e) Reporting requirements for TOC. Systems treating surface water or groundwater under the direct influence of surface water shall properly complete and submit periodic reports to demonstrate compliance with this section.

(1) The reports must be submitted to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087 by the tenth day of the month following the end of the reporting period.

(2) Public water systems must submit a Monthly Operational Report for Total Organic Carbon (commission Form 0879) each month.

(3) A system that does not meet the Step 1 removal requirements must submit a Request for Alternate TOC Requirements at least 15 days before the end of the quarter.

(A) If the system meets alternative compliance criterion Number 3, subsection (b)(2)(C) of this section, the system must report the running annual average TTHM and HAA5 concentrations as determined under the requirements of §290.113 of this title (relating to Stage 1 Disinfection By-products (TTHM and HAA5)) or §290.115 of this title (relating to Stage 2 Disinfection By-products (TTHM and HAA5)).

(B) If the system meets alternative compliance criterion Number 4, subsection (b)(2)(D) of this section, the system must report the running annual average TTHM and HAA5

concentrations as determined under the requirements of §290.113 of this title or §290.115 of this title, and report all disinfectants used by the system during last 12 months.

(C) If the system meets alternative compliance criterion Number 5, subsection (b)(2)(E) of this section, the system must report the average source water SUVA for each of the preceding 12 months.

(D) If the system meets alternative compliance criterion Number 6, subsection (b)(2)(F) of this section, the system must report the average treated water SUVA for each of the preceding 12 months.

(E) If the system practices softening and meets alternative compliance criterion Number 8, subsection (b)(2)(H) of this section, the system must report the source water and treated water magnesium concentrations and the average percent removal of magnesium obtained during each of the preceding 12 months.

(F) A system that does not meet any of the alternative compliance criteria must apply for the Step 2 alternative removal requirements and must submit the results of Step 2 jar testing.

(f) Compliance determination. Compliance with the requirements of this section shall be based on the following criteria:

(1) A system that fails to conduct the monitoring tests required by this section commits a monitoring violation. Failure to monitor will be treated as a violation for the entire period covered by the annual average.

(2) A system that fails to report the results of monitoring tests required by this section commits a reporting violation. Systems may use only data collected under the provisions of this section to qualify for reduced monitoring.

(3) A system that does not meet any of the alternative compliance criteria and does not achieve the required TOC removal commits a treatment technique violation. Compliance shall be determined quarterly by determining an annual average removal ratio using the following method:

(A) The actual monthly TOC percent removal must be determined for each month. The actual removal for a TOC sample set is equal to (1 - treated water TOC/source water TOC). The actual monthly percent removal is calculated by taking average removal for all TOC sample sets collected in the month, and expressing that value as a percent.

(B) The required monthly Step 1 or Step 2 TOC percent removal must be determined as provided in subsection (b) of this section. The executive director will approve or disapprove Step 2 requirements based on jar or pilot data. Until the executive director approves the Step 2 TOC removal requirements, the system must meet the Step 1 TOC removals contained in subsection (b)(1) of this section.

(C) The monthly removal ratio must be determined. The monthly removal ratio is determined by dividing the actual monthly TOC percent removal for each month by the required monthly Step 1 or approved Step 2 TOC percent removal for the month. The alternative compliance criteria may be used on a monthly basis as described in clauses (i) - (iv) of this subparagraph.

(i) If the monthly average source or treated water TOC is less than 2.0 mg/L, a monthly removal ratio value of 1.0 may be assigned (in lieu of the value calculated in subsection (f)(3)(C) of this section) when calculating compliance under the provisions of this section.

(ii) If the monthly average water source or treated SUVA level is less than 2.0 L/mg-m, a monthly removal ratio value of 1.0 may be assigned (in lieu of the value calculated in subsection (f)(3)(C) of this section) when calculating compliance under the provisions of this section.

(iii) In any month that a softening system lowers alkalinity below 60 mg/L (as CaCO3), a monthly removal ratio value of 1.0 may be assigned (in lieu of the value calculated in subsection (f)(3)(C) of this section) when calculating compliance under the provisions of this section.

(iv) In any month that a softening system removes at least 10 mg/L of magnesium hardness (as CaCO3) a monthly value of 1.0 may be assigned (in lieu of the value calculated in subsection (f)(3)(C) of this section) when calculating compliance under the provisions of this section.

(D) The yearly removal ratio must be determined. The yearly removal ratio is the running annual average of the quarterly averages of the monthly averages. To determine this value, for

each quarter in the compliance year, determine the monthly removal ratio, add the removal ratios and divide by three. Then, add the quarterly removal ratio and divide by four.

(E) If the yearly removal ratio is less than 1.00, the system commits a treatment technique violation.

(4) A public water system that fails to do a required public notice or certify that the public notice has been performed commits a public notice violation.

(g) Public Notification. A public water system that violates the treatment technique requirements of this section must notify the executive director and the system's customers.

(1) A public water system that commits a TOC treatment technique violation shall notify the executive director and the water system customers in accordance with the requirements of §290.122(b) of this title (relating to Public Notification).

(2) A public water system which fails to conduct the monitoring required by this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

§290.113. Stage 1 Disinfection By-products (TTHM and HAA5).

(a) Applicability for TTHM and HAA5. All community and nontransient, noncommunity water systems shall comply with the requirements of this section.

(1) Systems must comply with the Stage 1 requirements in this section until the date shown in the table entitled "Date to Start Stage 2 Compliance."

(2) Until the date shown in the table in paragraph (1) of this subsection, systems must continue to monitor according to this section.

Figure: 30 TAC §290.113(a)(2)

Date to Start Stage 2 Compliance

This type of system:	**Must comply with Stage 2 starting:**
Systems that are not part of a combined distribution system and systems that serve the largest population in the combined distribution system	
System serving 100,000 or more population	April 1, 2012
System serving 50,000 to 99,999 population	October 1, 2012
System serving 10,000 to 49,999 population	October 1, 2013
System serving fewer than 10,000 population if the system distributes only treated groundwater or potable water purchased from another system	October 1, 2013
System serving fewer than 10,000 population that treats surface water (or groundwater under the direct influence of surface water) if no *Cryptosporidium* monitoring is required under §290.111(b)(3)(B)	October 1, 2013
System serving fewer than 10,000 population that treats surface water (or groundwater under the direct influence of surface water) if *Cryptosporidium* monitoring is required under §290.111(b)(3)(B)	October 1, 2014
Systems that are part of a combined distribution system	
Consecutive system or wholesale system that is part of a combined distribution system	-at the same time as the system with the earliest compliance date in the combined distribution system

(b) Maximum contaminant level (MCL) for TTHM and HAA5. The running annual average concentration of total trihalomethanes (TTHM) and haloacetic acids (five) (HAA5) shall not exceed the maximum contaminant levels.

(1) The MCL for TTHM is 0.080 milligrams/liter (mg/L).

(2) The MCL for HAA5 is 0.060 milligrams/liter.

(c) Monitoring requirements for TTHM and HAA5. Systems must take all TTHM and HAA5 samples during normal operating conditions. Monitoring shall be performed at locations and frequency specified in the system's monitoring plan.

(1) The minimum number of samples required to be taken shall be based on the number of treatment plants used by the system, except that multiple wells drawing raw water from a single aquifer shall be considered as one treatment plant for determining the minimum number of samples.

(2) All samples taken within one sampling period shall be collected within a 24-hour period.

(3) Systems must routinely sample at the frequency and locations given in the following table entitled "Stage 1 Routine Monitoring Frequency and Locations for TTHM and HAA5."

Figure: 30 TAC §290.113(c)(3)

STAGE 1
ROUTINE MONITORING FREQUENCY AND LOCATIONS FOR TTHM AND HAA5

Type of system	Minimum Monitoring Frequency	Sample Location in the distribution system
Surface water or groundwater under the direct influence of	four water samples per quarter per	At least 25 % of all samples collected each quarter at locations representing maximum

surface water system serving at least 10,000 persons	treatment plant	residence time. Remaining samples taken at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods[1].
Surface water or groundwater under the direct influence of surface water system serving from 500 to 9,999 persons	one water sample per quarter per treatment plant	Locations representing maximum residence time[1].
Surface water or groundwater under the direct influence of surface water system serving fewer than 500 persons	one sample per year per treatment plant during month of warmest water temperature	Locations representing maximum residence time[1]. If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets reduced monitoring criteria in subsection (c) of this section.
System using only groundwater not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons	one water sample per quarter per treatment plant [2]	Locations representing maximum residence time[1] .
System using only groundwater not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons	one sample per year per treatment plant[2] during month of warmest water temperature	Locations representing maximum residence time[1]. If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets criteria in subsection (c) of this section for reduced monitoring.

1 If a system elects to sample more frequently than the minimum required, at least 25 % of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.

2 With approval of the executive director, multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required.

(4) The executive director may reduce the monitoring frequency for TTHM and HAA5 as indicated in the following table entitled " Stage 1 Reduced Monitoring Frequency and Locations for TTHM and HAA5."

Figure: 30 TAC §290.113(c)(4)

STAGE 1
REDUCED MONITORING FREQUENCY AND LOCATIONS FOR TTHM AND HAA5

IF YOU ARE A...	**YOU MAY REDUCE MONITORING IF YOU HAVE MONITORED AT LEAST ONE YEAR AND YOUR...**	**TO THIS LEVEL**
Surface water or groundwater under the direct influence of surface water system serving at least 10,000 persons which has a source water annual average TOC level, before any treatment, less than or equal to 4.0 mg/L[1]	TTHM annual average less than or equal to 0.040 mg/L and HAA5 annual average less than or equal to 0.030mg/L	one sample per treatment plant per quarter at distribution system location reflecting maximum residence time
Surface water or groundwater under the direct influence of surface water system serving from 500 to 9,999 people which has a source water annual average TOC level, before any treatment, less than or equal to 4.0 mg/L[1]	TTHM annual average less than or equal to 0.040 mg/L and HAA5 annual average less than or equal to 0.030mg/L	one sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature.
Surface water or groundwater under the direct influence of surface water system serving fewer than 500 people		Any surface water or groundwater under the direct influence of surface water system serving fewer than 500 persons may not reduce its monitoring to less than one sample per treatment plant per year.

System using only groundwater not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons	TTHM annual average less than or equal to 0.040 mg/L and HAA5 annual average less than or equal to 0.030mg/L	one sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature
System using only groundwater not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons	TTHM annual average less than or equal to 0.040 mg/L and HAA5 annual average less than or equal to 0.030mg/L for two consecutive years OR TTHM annual average less than or equal to 0.020 mg/L and HAA5 annual average less than or equal to 0.015mg/L for one year	one sample per treatment plant per three year monitoring cycle at distribution system location reflecting maximum residence time during month of warmest water temperature, with the three-year cycle beginning on January 1 following quarter in which system qualifies for reduced monitoring.
[1] TOC sampling must be performed in accordance with §290.112(c)(2)(C) of this title (relating to Total Organic Carbon (TOC))		

(A) The executive director may not reduce the routine monitoring requirements for TTHM and HAA5 until a system has completed one year of routine monitoring in accordance with the provisions of paragraph (3) of this subsection.

(B) A system that is on reduced monitoring and collects quarterly samples for TTHM and HAA5 may remain on reduced monitoring as long as the running annual average of quarterly averages for TTHM and HAA5 is no greater than 0.060 mg/L and 0.045 mg/L, respectively.

(C) A system that is on a reduced monitoring and monitors no more frequently than once each year may remain on reduced monitoring as long as TTHM and HAA5 concentrations are no greater than 0.060 mg/L and 0.045 mg/L, respectively.

(5) The executive director may require a system to return to the routine monitoring frequency described in paragraph (3) of this subsection.

(A) A system that does not meet the requirements of paragraph (4)(B) or (C) of this subsection must return to routine monitoring in the quarter immediately following the quarter in which the results exceed 0.060 mg/L or 0.045 mg/L for TTHMs and HAA5, respectively.

(B) A system that is on reduced monitoring and makes any significant change to its source of water or treatment program shall return to routine monitoring in the quarter immediately following the quarter when the change was made.

(C) If a system is returned to routine monitoring, routine monitoring shall continue for at least one year before a reduction in monitoring frequency may be considered.

(d) Analytical requirements for TTHM and HAA5. Analytical procedures required by this section shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for TTHM and HAA5 shall be performed at a laboratory certified by the executive director.

(e) Reporting requirements for TTHM and HAA5. Upon the request of the executive director, the owner or operator of a public water system must provide the executive director with a copy of the results of any test, measurement, or analysis required by this subsection. The copies must be submitted within ten days of the request or within ten days of their receipt by the public water system, whichever is later. The

copies must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(f) Compliance determination for TTHM and HAA5. Compliance with the provisions of this section shall be determined as follows.

(1) A system that fails to monitor in accordance with this section commits a monitoring violation. Failure to monitor will be treated as a violation for the entire period covered by the annual average.

(2) A public water system that fails to report the results of the monitoring tests required by subsection (e) of this section commits a reporting violation.

(3) Compliance with the MCLs for TTHM and HAA5 shall be based on the running annual average of all samples collected during the preceding 12 months.

(A) A public water system that samples for TTHM and HAA5 each quarter must calculate the running annual average of the quarterly averages.

(B) A public water system that samples for TTHM and HAA5 no more frequently than once each year must calculate the annual average of all samples collected during the year.

(C) All samples collected at the sampling sites designated in the public water system's shall be used to compute the quarterly and annual averages unless the analytical results are invalidated by the executive director for technical reasons.

(4) A public water system violates the MCL for TTHM if the running annual average for TTHM exceeds the MCL specified in subsection (b)(1) of this section.

(5) A public water system violates the MCL for HAA5 if the running annual average for HAA5 exceeds the MCL specified in subsection (b)(2) of this section.

(6) If a public water system is routinely sampling in accordance with the requirements of subsection (c)(3) of this section and an individual sample or quarterly average will cause the system to exceed the MCL for TTHM or HAA5, the system is in violation of the respective MCL at the end of that quarter.

(7) If a public water system's failure to monitor makes it impossible to determine compliance with the MCL for TTHM or HAA5, the system commits an MCL violation for the entire period covered by the annual average.

(g) Public Notification Requirements for TTHM and HAA5. A public water system that violates the treatment technique requirements of this section must notify the executive director and the system's customers.

(1) A public water system that violates an MCL given in subsection (b)(1) or (2) of this section shall report to the executive director and the water system customers in accordance with the requirements of §290.122(b) of this title (relating to Public Notification).

(2) A public water system which fails to conduct the monitoring required by subsection (c) of this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

§290.114. Other Disinfection By-products (Chlorite and Bromate).

(a) Chlorite. All community and nontransient noncommunity public water systems that use chlorine dioxide must comply with the requirements of this subsection.

(1) Maximum contaminant level (MCL) for chlorite. The chlorite concentration in the water in the distribution system shall not exceed an MCL of 1.0 milligrams per liter (mg/L).

(2) Monitoring requirements for chlorite. Public water systems shall measure the chlorite concentration at locations and intervals specified in the system's monitoring plan. All samples must be collected during normal operating conditions.

(A) Each plant using chlorine dioxide must monitor the chlorite concentration in the water entering the distribution system at least once each day. The monitoring frequency at the entry point to the distribution system may not be reduced.

(B) Each plant using chlorine dioxide must monitor the chlorite concentration in the water within the distribution system at each of the following three locations: at a location near the first customer of a plant using chlorine dioxide; at a location representative of the average residence time in the distribution system; and at a location reflecting maximum residence time in the distribution system. The group of three samples must be collected on the same day and is called a "three-sample set."

(i) Each system must collect at least one three-sample set each month.

(ii) If the chlorite concentration entering the distribution system exceeds 1.0 mg/L, the system must collect a three-sample set within 24 hours.

(iii) The frequency of chlorite monitoring in the distribution system may be reduced to one three-sample set per quarter if none of the entry point or distribution system samples tested during the preceding 12 months contained a chlorite concentration above 1.0 mg/L. A system must revert to the monthly monitoring frequency if the chlorite concentration exceeds 1.0 mg/L in any sample.

(3) Analytical requirements for chlorite. Analytical procedures required by this section shall be performed in accordance with the requirements of §290.119 of this title (relating to Analytical Procedures).

(A) The chlorite concentration of the water entering the distribution system must be analyzed at a facility approved by the executive director. The analysis must have a minimum accuracy of 0.05 mg/L and use one of the following methods:

(i) amperometric titration using a unit with platinum-platinum electrodes; or

(ii) ion chromatography.

(B) The chlorite concentration of the water within the distribution system must be analyzed using ion chromatography at a facility certified by the executive director.

(4) Reporting requirements for chlorite. Public water systems that are subject to the provisions of this subsection must provide the executive director with the results of any test, measurement, or analysis required by this section.

(A) Systems using chlorine dioxide must submit a Chlorine Dioxide Monthly Operating Report (commission Form 0690) by the tenth day of the month following the end of the reporting period.

(B) Upon the request of the executive director, systems shall provide the executive director with a copy of the results of any chlorite test, measurement, or analysis required by

subsection (a)(2)(B) of this section within ten days following receipt of the results of such test, measurement, or analysis.

(C) Reports and analytical results must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(5) Compliance determination for chlorite. Compliance with the requirements of this subsection shall be based on the following criteria.

(A) A public water system that fails to conduct the monitoring tests required by this subsection commits a monitoring violation.

(B) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation.

(C) A public water system commits an MCL violation if the arithmetic average of any three-sample set collected in the distribution system exceeds the MCL for chlorite.

(D) A public water system that fails to do a required public notice or certify that the public notice has been performed commits a public notice violation.

(6) Public notification requirements for chlorite. A public water system that violates the requirements of this subsection must notify the executive director and the system's customers.

(A) A public water system that violates the MCL for chlorite shall notify the executive director by the end of the next business day and the customers in accordance with the requirements of §290.122(b) of this title (relating to Public Notification).

(B) A public water system which fails to conduct the monitoring required by this subsection must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

(b) Bromate. Community and nontransient, noncommunity public water systems that use ozone must comply with the requirements of this subsection beginning on January 1, 2002.

(1) Maximum contaminant level for bromate. The concentration of bromate at the entry point to the distribution system shall not exceed an MCL of 0.010 mg/L.

(2) Monitoring requirements for bromate. Each plant using ozone must measure the bromate concentration in the water entering the distribution system at least once each month. The monitoring frequency at the entry point to the distribution system may not be reduced. Samples shall be collected when the ozonation system is operating under normal conditions and at locations and intervals specified in the system's monitoring plan.

(3) Analytical requirements for bromate. Analytical procedures required by this section shall be performed in accordance with §290.119 of this title. Testing for bromate shall be performed at a laboratory certified by the executive.

(4) Reporting requirements for bromate. Upon the request of the executive director, the owner or operator of a public water system must provide the executive director with a copy of the results of any test, measurement, or analysis required by this subsection. The copies must be submitted within ten days of the request or within ten days of their receipt by the public water system, whichever is later. The copies must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(5) Compliance determination for bromate. Compliance with the requirements of this subsection shall be determined using the following criteria.

(A) A system that fails to monitor in accordance with this section commits a monitoring violation. Failure to monitor will be treated as a violation for the entire period covered by the annual average.

(B) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation.

(C) A public water system violates the MCL for bromate if, at the end of any quarter, the running annual average of monthly averages, computed quarterly, exceeds the maximum contaminant level specified in paragraph (1) of this subsection.

(D) A public water system that fails to do a required public notice or certify that the public notice has been performed commits a public notice violation.

(6) Public notification requirements for bromate. A public water system that violates the requirements of this subsection must notify the water system's customers and the executive director.

(A) A public water system that violates the MCL for bromate shall notify the customers in accordance with the requirements of §290.122(b) of this title.

(B) A public water system which fails to conduct the monitoring required by this subsection must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

§290.115. Stage 2 Disinfection By-products (TTHM and HAA5).

(a) Applicability for TTHM and HAA5. All community and nontransient, noncommunity water systems shall comply with the requirements of this section for total trihalomethanes (TTHM) and haloacetic acids (group of five) (HAA5).

(1) Systems must comply with the initial monitoring requirements starting on the dates given in subsection (c) of this section.

(2) Systems must comply with all of the additional requirements in this section starting on the date shown in the table entitled "Date to Start Stage 2 Compliance."

Figure: 30 TAC §290.115(a)(2)

Date to Start Stage 2 Compliance[1]

This type of system:	**Must comply with Stage 2 starting:**
Systems that are not part of a combined distribution system and systems that serve the largest population in the combined distribution system	
System serving 100,000 or more population	April 1, 2012
System serving 50,000 to 99,999 population	October 1, 2012
System serving 10,000 to 49,999 population	October 1, 2013
System serving fewer than 10,000 population if the system distributes only treated groundwater or potable water purchased from another system	October 1, 2013
System serving fewer than 10,000 population that treats surface water (or groundwater under the direct influence of surface water) if no *Cryptosporidium* monitoring is required under §290.111(b)(3)(B) of this title (relating to Surface Water Treatment)	October 1, 2013
System serving fewer than 10,000 population that treats surface water (or groundwater under the direct influence of surface water) if *Cryptosporidium* monitoring is required under §290.111(b)(3)(B) of this title	October 1, 2014
Systems that are part of a combined distribution system	
Consecutive system or wholesale system that is part of a combined distribution system	At the same time as the system with the earliest compliance date in the combined distribution system
[1] The executive director may grant a two-year extension to the compliance dates shown in this table in accordance with 40 CFR §141.620(c)(5).	

(A) Systems required to conduct quarterly monitoring, must begin monitoring in the first full calendar quarter that includes the compliance date in the table titled "Date to Start Stage 2 Compliance."

(B) Systems required to conduct routine monitoring less frequently than quarterly must begin monitoring in the calendar month approved by the executive director in their IDSE report or revised monitoring plan identifying Stage 2 sample sites.

(b) Maximum contaminant levels (MCL) and operational evaluation levels (OELs) for TTHM and HAA5. Systems shall comply with MCLs and OELs.

(1) The locational running annual average (LRAA) concentration of TTHM and HAA5 shall not exceed the maximum contaminant levels. A public water system that exceeds a MCL shall determine compliance as described in subsection (f) of this section.

(A) The MCL for TTHM is 0.080 milligrams/liter (mg/L).

(B) The MCL for HAA5 is 0.060 mg/L.

(2) The OEL at any monitoring location is the sum of the two previous quarters' results plus twice the current quarter's result, divided by 4 to determine an average. A public water system that exceeds an OEL shall perform operation evaluation monitoring and reporting described in subsection (e) of this section.

(A) The OEL for TTHM is 0.080 mg/L.

(B) The OEL for HAA5 is 0.060 mg/L.

(c) Monitoring requirements for TTHM and HAA5. Monitoring shall be performed at locations and frequency specified in the system's monitoring plan as approved by the executive director.

(1) Monitoring locations. Systems must establish Stage 2 compliance monitoring sites throughout the distribution system at locations with the potential for relatively high disinfection by-product formation. Systems must determine Stage 2 compliance monitoring locations by the dates shown in the table titled "Date to Establish Stage 2 Sites."

Figure: 30 TAC §290.115(c)(1)

Date to Establish Stage 2 Sites

This type of system:	Must Establish Stage 2 sites by:
Systems that are not in a combined distribution system:	
System serving 100,000 or more people	January 1, 2009
System serving 50,000 to 99,999 people	July 1, 2009
System serving 10,000 to 49,999 people	January 1, 2010
System serving fewer than 10,000 people	July 1, 2010
Systems in a combined distribution system	
Consecutive or wholesale system of any population	at the same time as the largest system in the combined distribution system

(A) Systems that perform initial distribution system evaluation (IDSE) sampling in accordance with subsection (c)(5) of this section must use the results to set Stage 2 compliance monitoring sites.

(B) Systems that do not perform IDSE sampling must set Stage 2 compliance monitoring sites through consultation with the executive director in accordance with this subparagraph.

(i) Systems required to sample at the same number of sites under Stage 1 and Stage 2, can use the Stage 1 sites for Stage 2 compliance monitoring.

(ii) Systems required to sample at more sites under Stage 2 than Stage 1 must identify Stage 2 sites in addition to the existing Stage 1 sites. Systems must identify additional sites representing areas of the distribution system with potentially high TTHM or HAA5 levels and provide the rationale for identifying these locations as having high levels of TTHM or HAA5. The required number of compliance monitoring locations must be identified.

(iii) Systems required to sample at fewer sites under Stage 2 than Stage 1 must identify which locations will be used for Stage 2. Stage 2 sites will be selected by alternating selection of Stage 1 locations representing the highest TTHM levels and highest HAA5 levels until the required number of compliance monitoring locations have been identified.

(C) The protocol given in Title 40 Code of Federal Regulations (40 CFR) §141.605(c) for selecting Stage 2 sample sites is hereby adopted by reference.

(D) To change monitoring locations, a system must replace existing compliance monitoring locations with the lowest LRAA with new locations that reflect the current distribution system locations with expected high TTHM or HAA5 levels. Changes must be approved by the executive director and included in the monitoring plan.

(2) Routine sampling frequency and number of sample sites are given in the following table, titled "Routine Stage 2 Monitoring Frequency and Number of Sites." Systems must take all routine compliance TTHM and HAA5 samples during normal operating conditions.

Figure: 30 TAC §290.115(c)(2)

Routine Stage 2 Monitoring Frequency and Number of Sites

Water Type	Retail Population	Routine Frequency [1]	Routine Number of Sites [5]
Surface Water (or Groundwater Under the Direct Influence of Surface Water) [2]	fewer than 500	annual	1 or 2 [3]
	500 to 3,300	quarterly	1 or 2 [3]
	3,301 to 9,999	quarterly [4]	2
	10,000 to 49,999	quarterly [4]	4
	50,000 to 249,999	quarterly [4]	8
	250,000 to 999,999	quarterly [4]	12
	1,000,000 to 4,999,999	quarterly [4]	16
	5,000,000 or more	quarterly [4]	20
Groundwater	fewer than 500	Annual	2 [3]
	500 to 9,999	Annual	2 [3]
	10,000 to 99,999	quarterly [4]	4
	100,000 to 499,999	quarterly [4]	6
	500,000 or more	quarterly [4]	8

1 All systems must monitor during month of highest disinfection by-product concentrations.
2 A system that uses any treated surface water or groundwater under the direct influence of surface water shall be considered a surface water system for purposes of this section.
3 Systems on annual monitoring and surface water systems serving 500 to 3,300 people must identify two (2) sample sites in accordance with 40 CFR §141.605(b). Systems on annual monitoring and surface water systems serving 500 to 3,300 people will use a single site if the highest TTHM and HAA5 concentrations occur at the same time and place. If highest TTHM and HAA5 concentrations occur at the same time and location, one dual sample set must be collected at that location. If highest TTHM and HAA5 concentrations occur at different locations, then a single TTHM sample must be collected at the location with higher historical TTHM, and a single HAA5 sample must be collected at the location with higher historical HAA5.
4 Systems on quarterly monitoring must take dual sample sets every 90 days.
5 Monitoring locations must be approved by the executive director.

(3) Monitoring may be reduced when the LRAA is less than or equal to 0.040 mg/L for TTHM and less than or equal to 0.030 mg/L for HAA5 at all Stage 2 compliance monitoring locations. The Stage 2 reduced sampling frequency and number of sample sites are given in the following table, titled “Reduced Stage 2 Monitoring Frequency and Number of Sites.”

Figure: 30 TAC §290.115(c)(3)

Reduced Stage 2 Monitoring Frequency and Number of Sites

Source Water Type	Population Size Category	Monitoring Frequency [1]	Distribution System Monitoring Location Total per Monitoring Period
Surface or GUI	less than 500	Annual	Monitoring may not be reduced.
	500 to 3,300	Annual	1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter. [2]
	3,301 to 9,999	Annual	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement.
	10,000 to 49,999	quarterly	2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs
	50,000 to 249,999	quarterly	4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs
	250,000 to 999,999	quarterly	6 dual sample sets at the locations with the three highest TTHM and three highest HAA5 LRAAs
	1,000,000 to 4,999,999	quarterly	8 dual sample sets at the locations with the four highest TTHM and four highest HAA5 LRAAs
	5,000,000 or more	quarterly	10 dual sample sets at the locations with the five highest TTHM and five highest HAA5 LRAAs
Ground-water	less than 500	every third year (triennial)	1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter. [2]
	500 to 9,999	Annual	1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter. [2]
	10,000 to 99,999	Annual	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement
	100,000 to 499,999	quarterly	2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs
	500,000 or more	quarterly	4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs

1 Systems on quarterly monitoring must take dual sample sets every 90 days.
2 Systems on annual monitoring and surface water systems serving 500 to 3,300 people will use a single site if the highest TTHM and HAA5 concentrations occur at the same time and place. Any such system may be required to take individual TTHM and HAA5 samples (instead of a dual sample set) at sites identified as the highest TTHM and HAA5 sites, respectively. If separate sites for individual TTHM and HAA5 samples are used, then the TTHM sample must be collected during the quarter with highest historical TTHM levels and the HAA5 sample must be collected during the quarter with the highest historical HAA5 level.

(A) Only data collected under the provisions of §290.113 of this title (relating to Stage 1 Disinfection By-products (TTHM and HAA5)) and under this section may be used to qualify for reduced monitoring.

(B) In order to qualify for reduced monitoring, a system must meet the applicable conditions of this subparagraph.

(i) Systems with annual or less frequent routine monitoring qualify to remain on reduced monitoring as long as each TTHM sample is less than or equal to 0.060 mg/L and each HAA5 sample is less than or equal to 0.045 mg/L.

(ii) Systems on quarterly reduced monitoring qualify to remain on reduced monitoring as long as the TTHM LRAA is less than or equal to 0.040 mg/L and the HAA5 LRAA is less than or equal to 0.030 mg/L at each monitoring location.

(iii) To qualify for reduced monitoring, the source water annual average TOC level, before any treatment, must be less than or equal to 4.0 mg/L at each treatment plant treating surface water or groundwater under the direct influence of surface water, based on monitoring conducted under §290.112(c)(2)(C) of this title (relating to Total Organic Carbon (TOC)).

(C) Systems will be returned to routine monitoring:

(i) if the LRAA at any monitoring location exceeds either 0.040 mg/L for TTHM or 0.030 mg/L for HAA5 based on quarterly monitoring, or

(ii) if the annual (or triennial) sample at any location exceeds either 0.060 mg/L for TTHM or 0.045 mg/L for HAA5, or

(iii) if the source water annual average TOC level, before any treatment, exceeds 4.0 mg/L at any treatment plant treating surface water or groundwater under the direct influence of surface water.

(D) The executive director may return a system on reduced monitoring to routine monitoring at any time.

(E) A system that is on reduced Stage 1 monitoring in accordance with §290.113(c)(4) of this title that has monitoring locations for Stage 2 different from those under Stage 1 must initiate routine monitoring in accordance with subsection (c)(2) of this section on the schedule given in subsection (a) of this section.

(F) A system that is on reduced monitoring in accordance with §290.113(c)(4) of this title may remain on reduced monitoring after the dates identified in subsection (a)(2) of this section only if the system:

(i) received a very small system (VSS) Initial Distribution System Evaluation (IDSE) waiver under subsection (c)(5)(A) of this section or received a 40/30 IDSE waiver under subsection (c)(5)(B) of this section, and

(ii) meets the reduced monitoring criteria in (c)(3)(B), and

(iii) is approved to use the same monitoring locations under Stage 1 and Stage 2.

(G) The executive director may choose to perform calculations and determine whether the system is eligible for reduced monitoring in lieu of having the system report that information.

(4) The executive director may increase monitoring in accordance with this paragraph.

(A) A system required to routinely monitor at a particular location annually or less frequently than annually under subsection (c)(2) of this section must increase monitoring to quarterly dual sample sets (every 90 days) at all locations if any TTHM compliance sample is greater than 0.080 mg/L or if any HAA5 compliance sample is greater than 0.060 mg/L at any location.

(B) The executive director may return a system on increased quarterly monitoring to routine monitoring after at least four consecutive quarters if the LRAA for every monitoring location is less than or equal to 0.060 mg/L for TTHM and less than or equal to 0.045 mg/L for HAA5.

(C) A system that is on increased monitoring under §290.113 of this title must remain on increased monitoring until the system qualifies for a return to routine monitoring under subsection (c)(4)(B) of this section. The increased monitoring schedule must be conducted at the Stage 2 monitoring locations approved under subsection (c)(1) of this section, beginning on the date identified in subsection (a)(2) of this section.

(5) All community systems and nontransient noncommunity systems that serve at least 10,000 people must comply with these Initial Distribution System Evaluation (IDSE) requirements.

(A)The executive director may grant a VSS IDSE monitoring waiver to systems that serve fewer than 500 people. Systems that receive a VSS IDSE monitoring waiver are not required to do IDSE monitoring. Systems must be compliant with all of the Stage 1 monitoring requirements of §290.113 of this title to be eligible for a VSS IDSE waiver.

(B) The executive director may grant a 40/30 IDSE monitoring waiver to IDSE monitoring to systems with levels for TTHM less than 0.040 mg/L and levels for HAA5 less than 0.030 mg/L. Systems that receive a 40/30 IDSE monitoring waiver are not required to do IDSE monitoring. Systems must be compliant with all of the Stage 1 monitoring requirements of §290.113 of this title to be eligible for a 40/30 IDSE waiver. The timing of samples that all need to be less than 0.040 mg/L and 0.030 mg/L respectively for TTHM and HAA5 are given in the following table, titled “Timing of Stage 1 Samples Evaluated for 40/30 Waiver.”

Figure: 30 TAC §290.115(c)(5)(B)

Timing of Stage 1 Samples Evaluated for 40/30 IDSE Waiver

This type of system:	40/30 certification is based on eight consecutive calendar quarters of Stage 1 compliance monitoring results beginning no earlier than [1]
Systems that are not in a combined distribution system:	
System serving 100,000 or more people	January 2004
System serving 50,000 to 99,999 people	
System serving 10,000 to 49,999 people	January 2005
System serving fewer than 10,000 people	
Systems in a combined distribution system	
Consecutive or wholesale system of any population	at the same time as the largest system in the combined distribution system

1 A system that did not monitor during the specified period must base eligibility on compliance samples taken during the 12 months preceding the specified period.

(i) To qualify for a 40/30 IDSE waiver a system must certify to the executive director that every individual sample taken under §290.113 of this title were less than 0.040 mg/L for TTHM and less than 0.030 mg/L for HAA5, and must have not had any TTHM or HAA5 monitoring violations during the period specified in subsection (a) of this section.

(ii) To qualify for a 40/30 IDSE waiver, a system must submit compliance monitoring results, distribution system schematics, and recommended Stage 2 compliance

monitoring locations to the executive director upon request. The executive director may require a system that fails to submit the requested information to perform IDSE sampling.

(iii) The executive director may still require a system that meets the 40/30 IDSE waiver requirements to do IDSE sampling under subparagraph (C) of this paragraph.

(C) Systems that must perform IDSE sampling must submit any needed documentation for waivers, produce an IDSE Plan, do IDSE sampling, and report the IDSE results to the executive director on the schedule in the following table titled "IDSE Schedule."

Figure: 30 TAC §290.115(c)(5)(C)

IDSE Schedule

Retail population	**Submit IDSE plan or waiver documentation by** [1, 2]**:**	**Complete IDSE by:**	**Submit IDSE report by:** [3]
Systems that are not part of a combined distribution system and systems that serve the largest population in the combined distribution system			
100,000 or more	October 1, 2006	September 30, 2008	January 1, 2009
50,000 through 99,999	April 1, 2007	March 31, 2009	July 1, 2009
10,000 through 49,999	October 1, 2007	September 30, 2009	January 1, 2010
less than 10,000 (Community Only)	April 1, 2008	March 31, 2010	July 1, 2010
Other systems that are part of a combined distribution system:			
Any population	At the same time as the system with the earliest compliance date in the combined distribution system		

1 If, within 12 months after the date identified in this column, the executive director does not approve a system's IDSE plan or notify the system that review is incomplete, the IDSE plan will be considered approved. The system must implement that plan and must complete standard IDSE monitoring or a system specific study no later than the date identified in the third column.

2 Waiver documentation must be submitted by the date indicated.

3 If the executive director does not approve an IDSE report or notify a system that review is incomplete within three months after the IDSE report is due to be submitted, or within nine months of the date that waiver documentation must be submitted for systems receiving waivers, the submitted report or waiver documentation will be considered approved and must be implemented

(i) The IDSE plan has required elements.

(I) The IDSE plan must include a schematic of the distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating locations and dates of all projected standard monitoring, and also Stage 1 compliance monitoring under §290.113 of this title.

(II) The IDSE plan must include justification of IDSE monitoring location selection and a summary of data used to justify IDSE monitoring location selection.

(III) The IDSE plan must include the system type and population served by the system.

(ii) Systems must do required IDSE sampling in accordance with this clause.

(I) Systems must monitor at the number and type of sites indicated in the following table titled "Number and Type of IDSE Sample Sites:"

Figure: 30 TAC §290.115(c)(5)(C)(ii)(I)

Number and Type of IDSE Sample Sites [1]

Population and water type	IDSE Site Type				
	Near Entry Points	Average Residence Time	Potential High TTHM Locations	Potential High HAA5 Locations	Total Number of Sites
Systems distributing surface water or groundwater under the direct influence of surface water (GUI)					
less than 500 that purchase treated surface water or GUI	1	-	1	-	2
less than 500 with no purchased water source	-	-	1	1	2
500 to 3,300 that purchase treated surface water or GUI	1	-	1	-	2
500 to 3,300 with no purchased water source	-	-	1	1	2
3,301 to 9,999	-	1	2	1	4
10,000 to 49,999	1	2	3	2	8
50,000 to 249,999	3	4	5	4	16
250,000 to 999,999	4	6	8	6	24
1,000,000 to 4,999,999	6	8	10	8	32
5,000,000 or more	8	10	12	10	40
Systems that only use groundwater not under the direct influence of surface water					
less than 500 that purchase treated groundwater	1	-	1	-	2
less than 500 with no purchased water source nonconsecutive systems	-	-	1	1	2
500 to 9,999	-	-	1	1	2

10,000 to 99,999	1	1	2	2	6
100,000 to 499,999	1	1	3	3	8
500,000 or more	2	2	4	4	12

1 If the number of entry points to the distribution system is fewer than the specified number of entry point monitoring locations, excess entry point samples must be replaced equally at high TTHM and HAA5 locations. If there is an odd extra location number, the system must take a sample at a high TTHM location. If the number of entry points to the distribution system is more than the specified number of entry point monitoring locations, the system must take samples at entry points to the distribution system having the highest annual water flows.

(II) Systems must collect dual sample sets at each monitoring location. One sample in the dual sample set must be analyzed for TTHM. The other sample in the dual sample set must be analyzed for HAA5.

(III) IDSE sample locations must be different than the existing Stage 1 monitoring locations established under §290.113 of this title.

(IV) IDSE sample locations must be distributed throughout the distribution system.

(V) Systems must monitor at the frequency indicated in the following table titled “Frequency of IDSE Monitoring:”

Figure: 30 TAC §290.115(c)(5)(C)(ii)(V)

Frequency of IDSE Monitoring

Population and Type of Water	Sampling Frequency and Timing
Systems distributing surface water or groundwater under the direct influence of surface water (GUI)	
less than 500 that purchase treated surface water or GUI	one (during peak historical month)
less than 500 with no purchased water source	
500 to 3,300 that purchase treated surface water or GUI	four (every 90 days)
500 to 3,300 with no purchased water source	
3,301 to 9,999	
10,000 to 49,999	six (every 60 days)
50,000 to 249,999	
250,000 to 999,999	
1,000,000 to 4,999,999	
5,000,000 or more	
Systems that only use groundwater not under the direct influence of surface water	
less than 500 that purchase treated groundwater	one (during hottest month)
less than 500 with no purchased water source nonconsecutive systems	
500 to 9,999	four (every 90 days)
10,000 to 99,999	
100,000 to 499,999	
500,000 or more	

1 A dual sample set with both a TTHM and an HAA5 sample must be taken at each monitoring location during each monitoring period.

2 The hottest month is the historical month is the month with the highest TTHM or HAA5 levels or the warmest water temperature. Monitoring must be conducted during the peak historical month for TTHM levels or HAA5 levels or the month of warmest water temperature. Available compliance, study, or operational data must be reviewed to determine the peak historical month for TTHM or HAA5 levels or warmest water temperature.

(VI) The IDSE monitoring frequency and locations may not be reduced.

(iii) The IDSE report must comply with the elements in this clause.

(I) The IDSE report must include all TTHM and HAA5 analytical results from Stage 1 compliance monitoring under §290.113 of this title and all IDSE sample results and locational running annual averages presented in a tabular or spreadsheet format acceptable as described in TCEQ regulatory guidance number 384: "How to Develop a Monitoring Plan for a Public Water System."

(II) If changed from the IDSE plan submitted under clause (ii) of this subparagraph, the IDSE report must also include an updated distribution system map, documentation verifying the population served, and an updated list of sources including their water type.

(III) The IDSE report must include an explanation of any deviations from the approved IDSE plan.

(IV) The IDSE report must recommend and justify Stage 2 compliance monitoring locations consistent with subsection (c)(1) of this section. The recommended Stage 2 compliance monitoring locations must be listed in a Stage 2 sample plan as part of the system's monitoring plan.

(iv) The executive director may approve a system specific study that meets the requirements in 40 CFR §141.602 to comply with IDSE sampling requirements. The commission hereby adopts the requirements of 40 CFR §141.602 by reference.

(D) The executive director may require a system to perform IDSE sampling or a system specific study. The executive director may require a system to perform IDSE sampling or a system specific study even if the system meets the criteria for an IDSE waiver. The executive director may require new systems and systems with a change in population or system type to perform IDSE sampling or a system specific study.

(d) Analytical requirements for TTHM and HAA5. Analytical procedures required by this section shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for TTHM and HAA5 shall be performed at a laboratory certified by the executive director.

(e) Reporting requirements for TTHM and HAA5. Public water systems must submit reports related to TTHM and HAA5 to the executive director. Reports must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(1) Upon the request of the executive director, the owner or operator of a public water system must provide the executive director with a copy of the results of any test, measurement, or analysis required by this subsection. The copies must be submitted within ten days of the request or within ten days of their receipt by the public water system, whichever is later.

(A) The owner or operator of a public water system is responsible for reporting the following information for each monitoring location to the executive director within ten days of the end of any quarter in which monitoring is required:

(i) number of samples taken during the last quarter,

(ii) date and results of each sample taken during the last quarter,

(iii) arithmetic average of quarterly results for the last four quarters for each monitoring location (LRAA), beginning at the end of the fourth calendar quarter that follows the compliance date and at the end of each subsequent quarter,

(iv) whether the MCL was violated at any monitoring location, and

(v) any OELs that were exceeded during the quarter and, if so, the location and date, and the calculated TTHM and HAA5 levels.

(B) If the LRAA based on fewer than four quarters would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters, the system must report a potential MCL violation as part of the first report due following the compliance date or anytime thereafter that this determination is made.

(C) A system that treats surface water or groundwater under the direct influence of surface water that seeks to qualify for or remain on reduced TTHM and HAA5 monitoring must measure and report TOC monthly in accordance with §290.112 of this title (relating to Total Organic

Carbon) and distribution system disinfection levels in accordance with §290.110 of this title (relating to Disinfection).

(2) A system that exceeds an OEL described in subsection (b)(2) of this section must conduct an operation evaluation and submit a written operation evaluation report that meets the requirements of this paragraph.

(A) The operation evaluation report must be submitted to the executive director no later than 90 days after being notified of the analytical result that causes the exceedance of the OEL.

(B) The operation evaluation report must document an examination of system treatment and distribution operation practices that may contribute to TTHM and HAA5 formation, including:

(i) storage tank operations;

(ii) excess storage capacity;

(iii) distribution system flushing;

(iv) changes in sources or source water quality;

(v) treatment changes or problems; and

(vi) what steps could be considered to minimize future exceedances.

(C) If the cause of the OEL exceedance is identifiable the scope of the report may be limited with the approval of the executive director. A request to limit the scope of the evaluation does not extend the schedule in paragraph (2)(A) of this subsection for submitting the written report. The executive director's approval to limit the scope of the operation evaluation report must be in writing. The system must keep a copy of the executive director's approval with the completed operation evaluation report.

(D) The operation evaluation report must be submitted and approved in writing.

(f) Compliance determination for TTHM and HAA5. Compliance with the provisions of this section shall be determined as follows.

(1) A public water system violates the MCL for TTHM if any locational running annual average for TTHM exceeds an MCL specified in subsection (b)(1)(A) of this section. A public water system violates the MCL for HAA5 if any locational running annual average for HAA5 exceeds the MCL specified in subsection (b)(1)(B) of this section.

(A) Compliance with the MCLs for TTHM and HAA5 shall be based on the LRAA of all samples collected during four consecutive quarters of monitoring. If a single quarterly sample would cause an LRAA exceedance regardless of the results of subsequent quarters, compliance

may be based on fewer than four quarters of data. Should a system fail to collect all required samples, compliance will be based on the available data. All samples collected at the sampling sites designated in the public water system's monitoring plan shall be used to compute the quarterly and annual averages unless the analytical results are invalidated by the executive director for technical reasons.

(B) Stage 2 MCL compliance determination with LRAAs will start after Stage 2 samples are collected.

(i) For systems required to conduct routine quarterly monitoring, compliance calculations will be made starting at the end of the fourth calendar quarter that follows the compliance date in subsection (a)(2) of this section and at the end of each subsequent quarter.

(ii) For systems on quarterly monitoring, where the LRAA based on fewer than four quarters would exceed the MCL regardless of the monitoring results of subsequent quarters, compliance will be calculated beginning with the first sample that causes that exceedance.

(iii) For systems that are required to monitor less frequently than quarterly, compliance shall be calculated beginning with the first compliance sample taken after the compliance date.

(iv) For systems monitoring annually or triennially that start monitoring quarterly in the quarter following an LRAA exceedance, compliance shall be calculated based on the results of all available samples.

(C) If a public water system's failure to monitor makes it impossible to determine compliance with the MCL for TTHM or HAA5, the system commits an MCL violation for the entire period covered by the annual average.

(D) The executive director may choose to perform calculations and determine MCL exceedances in lieu of having the system report that information.

(E) IDSE results will not be used for the purpose of determining compliance with MCLs.

(2) A system that fails to monitor in accordance with this section commits a monitoring violation. A system on a quarterly monitoring schedule is in violation of the monitoring requirements for each quarter that it fails to monitor.

(3) A system that fails to perform a required operation evaluation under subsection (e)(2) of this section commits a monitoring violation.

(4) A public water system that fails to report the results of the monitoring tests required by subsection (e) of this section commits a reporting violation.

(5) A system that fails to submit an operation evaluation report as required under subsection (e)(2) of this section commits a reporting violation.

(6) A system that fails to perform a required public notification commits a public notification violation.

(g) Public Notification Requirements for TTHM and HAA5. A public water system that violates the treatment technique requirements of this section must notify the executive director and the system's customers.

(1) A public water system that commits an MCL violation described in subsection (f)(1) of this section shall report to the executive director and the water system customers in accordance with the requirements of §290.122(b) of this title (relating to Public Notification).

(2) A public water system which fails to conduct the monitoring required by subsection (c) of this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

(3) Any IDSE compliance documents required under subsection (c)(5) of this section must be made available to the executive director or the public upon request.

(4) Any operation evaluation report required under subsection (e)(2) of this section must be made available to the executive director or the public upon request.

§290.116. Groundwater Corrective Actions and Treatment Techniques.

(a) Applicability. All groundwater public water systems must comply with the treatment techniques and corrective actions of this section if a raw groundwater source sample was positive for fecal indicators or if the system is not required to conduct raw groundwater source monitoring because it provides at least 4-log treatment of viruses.

(1) A groundwater system must provide written notification to the executive director before December 1, 2009, that it is not required to meet the raw groundwater source monitoring requirements under §290.109(c)(4) of this title (relating to Microbial Contaminants) because it provides at least 4-log treatment of viruses and begin compliance monitoring in accordance with subsection (c) this section. The notification must include engineering, operational, and other information required by the executive director to evaluate the submission. If the system discontinues 4-log treatment of viruses before the first customer for any groundwater source, the system must conduct raw groundwater source sampling as required under §290.109(c)(4) of this title.

(2) A groundwater system that places a groundwater source in service after November 30, 2009, that is not required to meet the raw source monitoring requirements under §290.109(c)(4) of this title because the system provides at least 4-log treatment of viruses must begin compliance monitoring within 30 days of placing the source in service in accordance with subsection (c) of this section. The system must provide written notification to the executive director that it provides at least 4-log treatment of viruses at or before the first customer. The notification must include engineering, operational, and other information required by the executive director to evaluate the submission. If the system discontinues 4-log treatment of viruses before or at the first customer for a groundwater source, the system must conduct raw groundwater source sampling as required under subsection (c)(4) of this section.

(b) Groundwater corrective action plan. All public water systems using groundwater must submit a corrective action plan and implement corrective action if a raw groundwater source sample was positive for fecal indicators.

(1) If a groundwater source sample was found to be fecal indicator positive, the system must consult with the executive director regarding appropriate corrective action and have an approved corrective action plan in place within 30 days of receiving written notification from a laboratory of the fecal indicator positive source sample collected under subsection (c)(4) of this section.

(2) Within 120 days of receiving written notification from a laboratory of the fecal indicator positive source sample, the system must have completed corrective action or be in compliance with an approved corrective action plan and schedule.

(3) Any changes to the approved corrective action plan or schedule must be approved by the executive director.

(4) The executive director may require interim measures for the protection of public health pending approval of the corrective action plan. The system must comply with these interim measures as well as with any schedules specified by the executive director.

(5) Systems that are required to complete corrective action must implement one or more of the procedures in this paragraph and the details of the implementation must be specified in the approved corrective action plan.

(A) The system may disinfect the groundwater source where the fecal indicator positive source sample was collected following the American Water Works Association (AWWA) standards for well disinfection and start monthly fecal indicator sampling at that source within 30 days after well disinfection. The executive director may discontinue the monthly source sampling requirement if corrective action is sufficient.

(B) The system may eliminate the source that was found to be fecal indicator positive and provide an alternate source if necessary. Eliminated sources must be disconnected from the distribution system.

(C) The system may identify and eliminate the source of fecal contamination followed by well disinfection according to AWWA well disinfection standards and begin monthly fecal indicator sampling within 30 days after well disinfection. The executive director may allow the system to discontinue the monthly source sampling requirement after making a determination that corrective action is sufficient.

(D) The system may provide treatment that reliably achieves at least 4-log treatment of viruses using inactivation, removal or an executive director-approved combination of inactivation and removal before the first customer of the groundwater source.

(c) Microbial inactivation requirements. A system that treats groundwater in response to a fecal indicator positive source sample or in lieu of the raw groundwater source monitoring shall meet minimum disinfection requirements demonstrating at least 4-log treatment of viruses before the water is distributed.

(1) Monitoring requirements for chemical disinfectants. Groundwater systems shall monitor the performance of the disinfection facilities to ensure that appropriate disinfectant levels are maintained. All monitoring conducted pursuant to the requirements of this section must be conducted at sites designated in the system's monitoring plan.

(A) Groundwater systems serving a population greater than 3,300 must continuously monitor the residual disinfectant concentration at a location approved by the executive director and must record the lowest residual disinfectant concentration every day the groundwater source serves the public.

(B) Groundwater systems serving a population less than 3,300 must monitor the disinfectant residual in each disinfection zone at least once each day during a time when peak hourly raw water flow rates are occurring.

(C) Disinfection contact time will be based on tracer study data or a theoretical analysis submitted by the system owner or their designated agent and approved by the executive director.

(D) Groundwater treatment plants that fail to demonstrate an appropriate level of treatment must repeat these tests at four-hour or shorter intervals until compliance has been reestablished.

(2) Monitoring requirements for ultraviolet light (UV) disinfection facilities. Public water systems shall monitor the UV intensity as measured by a UV sensor, lamp status, the flow rate through the unit, and other parameters prescribed by the executive director to ensure that the units are operating within validated conditions.

(3) Analytical requirements. All monitoring required by this section must be conducted at a facility approved by the executive director and using methods that conform to the requirements of §290.119 of this title (relating to Analytical Procedures).

(A) The pH analysis must be conducted using a pH meter with a minimum accuracy of plus or minus 0.1 pH units.

(B) The temperature of the water must be measured using a thermometer or thermocouple with a minimum accuracy of plus or minus 0.5 degrees Celsius.

(C) The free chlorine residual must be measured to a minimum accuracy of plus or minus 0.1 mg/L using one of the following methods:

(i) Amperometric titration;

(ii) DPD Ferrous titration;

(iii) a DPD method that uses a colorimeter or spectrophotometer; or

(iv) Springaldizine (FACTS)

(D) The chloramine residual must be measured to a minimum accuracy of plus or minus 0.1 mg/L using one of the following methods:

(i) Amperometric titration;

(ii) DPD Ferrous titration; or

(iii) a DPD method that uses a colorimeter or spectrophotometer.

(E) The chlorine dioxide residual must be measured to a minimum accuracy of plus or minus 0.05 mg/L using one of the following methods:

(i) Amperometric titrator with platinum-platinum electrodes; or

(ii) Lissamine Green B.

(F) The ozone residual must be measured to a minimum accuracy of plus or minus 0.05 mg/L using an indigo method that uses a colorimeter or spectrophotometer.

(d) Reporting requirements. Groundwater systems required to conduct corrective action in response to a fecal indicator positive source sample or in lieu of the raw groundwater source monitoring must report to the executive director in accordance with this subsection.

(1) A groundwater system required to conduct compliance monitoring for chemical disinfectants must submit a Groundwater Treatment Monthly Operating Report (commission Form 20362) for groundwater disinfection facilities monthly. Groundwater systems must submit the first form starting before the month of December 2009, to avoid raw groundwater source monitoring.

(2) A groundwater system must provide written notification to the executive director before December 1, 2009, that it is not required to meet the raw groundwater source monitoring requirements under paragraph §290.109(c)(4) of this title (relating to Microbial Contaminants) because it provides at least 4-log treatment of viruses and begin compliance monitoring in accordance with subsection §290.116(c) of this section. The notification must include engineering, operational, and other information required by the executive director to evaluate the submission.

(3) A groundwater system required to complete corrective action under subsection (b) of this section must notify the executive director within 30 days of completing the corrective action.

(4) If a groundwater system is subject to the triggered source monitoring requirements of §290.109(c)(4)(A) of this title and does not conduct source monitoring, the system must provide written documentation that it was providing 4-log treatment of viruses within 30 days of the positive distribution coliform sample.

(e) Compliance determination. The executive director shall determine compliance for groundwater systems required to conduct corrective action in response to a fecal indicator positive source sample or in lieu of the raw groundwater source monitoring in accordance with this subsection.

(1) A groundwater system is in violation of the treatment technique requirement if it does not complete corrective action in accordance with the executive director-approved corrective action plan or any interim measures required by the executive director.

(2) A groundwater system is in violation of the treatment technique requirement if it is not in compliance with the executive director-approved corrective action plan and schedule.

(3) A groundwater system subject to the requirements of subsection §290.116(c) of this title that fails to maintain at least 4-log treatment of viruses is in violation of the treatment technique requirement if the failure is not corrected within four hours.

(4) A groundwater system that fails to conduct the disinfectant monitoring required under subsection (c) of this section commits a monitoring violation.

(5) A groundwater system that fails to report the results of the disinfectant monitoring required under subsection (c) of this section commits a reporting violation.

(6) A groundwater system that fails to issue a required public notice or certify that the public notice has been performed commits a public notice violation.

(f) Public notification. A groundwater system that commits a treatment technique, monitoring, or reporting violation as identified in this section must notify its customers of the violation in accordance with the requirements of §290.122 of this title (relating to Public Notification).

§290.117. Regulation of Lead and Copper.

(a) General requirements.

(1) Applicability--The requirements of this section apply to community and nontransient noncommunity water systems. New water systems will be required to meet the requirements of this section when notified by the executive director.

(2) Compliance--The water system is not in compliance if it fails to meet any reporting, monitoring, public education, or other requirement in this section relating to the regulation of lead and/or copper.

(A) All applicable water systems shall determine compliance based on monitoring and reporting requirements for lead and copper established in this section or contained in 40 Code of Federal Regulations (CFR) §§141.85, 141.86, 141.87, 141.88, or 141.90.

(B) Failure to conduct or report any requirements of this section shall constitute a monitoring, reporting or treatment technique violation and shall be a violation of these standards.

(3) Action levels for lead and copper are 0.015 milligrams per liter (mg/L) and 1.3 mg/L, respectively. The action levels are exceeded if the concentration of lead and/or copper in more than 10% of the first draw tap water samples collected during any monitoring period is greater that 0.015 mg/L for lead or 1.3 mg/L for copper. If collecting only five samples, the average of the two highest samples shall be used to determine compliance with the action level.

(b) Sample site selection and materials survey.

(1) By the applicable date for commencement of tap sample monitoring, each system shall complete a materials survey of its distribution system to identify a pool of tap sampling sites that meet the requirements of this section. All first draw tap samples are to be collected from this pool of sites. Sampling sites may not include faucets that have point-of-use or entry point treatment devices. After completing sample site selection, the system will submit the Lead and Copper Sample Site Selection form to the executive director for approval.

(2) Information for conducting a materials survey and selecting sampling sites are provided to each system by the executive director before initial tap sampling is initiated. Procedural requirements set forth in 40 CFR §141.86 will be followed for sampling site selection activities except that reporting of tap sampling sites to the executive director shall be conducted using the materials survey and sampling site selection forms supplied by the executive director. Supplemental explanatory information from the system will be considered as part of the sampling site selection document. Systems must make a good faith effort to conduct a thorough and complete materials survey and submit a valid sample site selection form before initial tap sampling may be conducted.

(3) A system that does not have enough Tier 1, 2, or 3 sites, as set forth in 40 CFR §141.86, must use other representative sites to complete its sampling pool. A representative site is one that uses plumbing materials commonly found at other sites to which the system provides water.

(c) Tap sampling.

(1) A first draw tap sample means a one liter or one quart sample of tap water collected from a cold water, frequently used interior tap, after the water has been standing in the plumbing for at least six hours and is collected without first flushing the tap. The kitchen cold water faucet is the preferred sampling tap at residential sites. It is recommended that the water not be allowed to stand in the plumbing for more than 18 hours prior to a sample collection.

(2) A sample collection may be conducted by either water system personnel or the residents. If the resident is allowed to collect samples for lead and copper monitoring, the water system must provide written instructions for sample collection procedures.

(3) A water system shall collect each tap sample from the same sampling site from which it collected a previous sample. If this is not possible, the water system shall provide a written explanation to the executive director. The water system must select an alternate sampling site from the system's sampling pool which meets similar criteria and is within reasonable proximity to the original sampling site.

(4) Monitoring approved by the executive director and conducted by systems in addition to the minimum requirements of this section shall be considered by the executive director in making any determination of compliance.

(5) The system shall collect at least two sets of initial tap samples during two consecutive six-month monitoring periods, unless granted a monitoring waiver.

(6) The minimum number of sample sites required for initial monitoring are listed in Table Number 1, as well as the number of sites required of each system conducting reduced monitoring.

Figure: 30 TAC §290.117(c)(6)

Table No. 1

SYSTEM SIZE (No. of People Served)	INITIAL MONITORING SITES	REDUCED MONITORING SITES
> 100,000	100	50
10,001 – 100,000	60	30
3,301 – 10,000	40	20
501 – 3,300	20	10
101 – 500	10	5
< 101	5	5

(7) Initial tap sampling shall be conducted only after the executive director has determined that a system has successfully completed a materials survey and has obtained approval of its sample site selection form which is required to be submitted by subsection (b)(2) of this section.

(8) A new community or nontransient noncommunity water system begins the first six-month initial monitoring period in the year following a new water system's assignment of a Public Water System identification number.

(d) Computing 90th percentile lead and copper levels. Determination of 90th percentile levels shall be obtained by ranking the results of lead and copper samples collected during a monitoring period in ascending order (lowest concentration equal sample Number 1; highest concentration equal sample Numbers 10, 20, 30, 40, 50, etc.), up to the total number of samples collected. The number of samples collected during the monitoring period shall be multiplied by 0.9 and the concentration of lead and copper in the numbered sample yielded by this calculation is the 90th percentile sample contaminant level. The system is in compliance with the lead and/or copper action levels if the 90th percentile sample contaminant level is equal to or less than the action levels specified in subsection (a)(3) of this section.

For water systems serving fewer than 101 people, the 90th percentile level is computed by taking the average of the highest two sample results.

(e) Reduced tap monitoring.

(1) The executive director shall notify each water system that it is eligible for reduced monitoring of first draw tap samples if it is in compliance with the 90th percentile lead and copper action levels after completion of 12 consecutive months of initial tap sampling.

(2) Reduced monitoring shall be conducted annually during June, July, August, or September by collecting one set of samples from the appropriate number of reduced monitoring sites, after notification.

(3) The number of reduced monitoring sites required for each system are found in Table Number 1 located in subsection (c)(6) of this section, if not otherwise specified by the executive director.

(4) Any system that the 90th percentile lead level is greater than 0.005 mg/L and/or the 90th percentile copper level is greater than 0.65 mg/L during either of the two initial six-month monitoring periods must conduct two annual rounds of reduced monitoring the two calendar years following the completion of initial tap sampling.

(5) Any system that demonstrates during the initial 12-month monitoring periods that the 90th percentile lead level is less than or equal to 0.005 mg/L and the 90th percentile copper level is less

than or equal to 0.65 mg/L shall have the required frequency of sampling reduced to once every three years and at the reduced number of sampling sites shown in subsection (c)(6) of this title, Table Number 1.

(f) Invalidation of lead or copper tap samples.

(1) A sample invalidated under this subsection does not count toward determining lead or copper 90th percentile levels or toward meeting the minimum number of tap sample requirements.

(2) The executive director may invalidate a lead or copper tap sample if one of the following conditions is met:

(A) the laboratory establishes that an analytical error has occurred or that an analytical method requirement has been violated;

(B) the executive director determines that the sample was taken from an inappropriate site;

(C) the sample was damaged in transit; or

(D) the executive director determines that the sample was subject to tampering.

(3) The water system must provide written documentation to the executive director for samples the water system believes should be invalidated.

(4) The water system must collect replacement samples for any samples invalidated under this section. Any such replacement samples must be collected as soon as possible, but no later than ten days after receiving notification of sample invalidation from the executive director.

(g) Monitoring waivers for small water systems.

(1) Small water system monitoring waivers approved by the executive director prior to January 1, 2002, shall remain in effect subject to the provisions of paragraph (2)(E) of this subsection.

(2) Any water system serving a population of less than 3,301 people that meets the criteria of subparagraphs (A) and (B) of this paragraph may apply to the executive director to reduce the frequency of monitoring for lead and copper to once every nine years.

(A) The water system must demonstrate on the lead/copper sampling site selection form that its distribution system and the service lines and all drinking water supply plumbing, including plumbing conveying drinking water within all residences and buildings connected to the system, are free of lead-containing materials and/or copper-containing materials to demonstrate the risk from lead and/or copper exposure is negligible throughout the water system.

(B) The water system must have completed at least one six-month series of initial tap water monitoring for lead and copper and have demonstrated that its 90th percentile lead level does not exceed 0.005 mg/L and the 90th percentile copper level does not exceed 0.65 mg/L.

(C) The executive director shall provide the water system with a waiver application setting forth the basis and conditions of the waiver after meeting the requirements of subparagraphs (A) and (B) of this paragraph.

(D) The executive director shall not issue any "partial waivers" for lead and copper monitoring.

(E) If a water system with a waiver adds a new source of water, changes any water treatment or no longer meets the requirements of subparagraph (A) of this paragraph, the water system must notify the executive director in writing within 60 days of the change. The executive director has the authority to add or modify the monitoring waiver conditions, if modifications are necessary to address changes that have occurred since approving the original waiver application.

(h) Monitoring requirements for water quality parameters (WQPs) and source water.

(1) Water quality parameters.

(A) All large water systems (serving populations greater than 50,000) are required to conduct monitoring beginning with the initial period of first draw tap samples and continuing until corrosion control is optimized.

(B) All medium and small water systems (serving populations of 3,301 to 50,000 and less than 3,301, respectively) that exceed the lead or copper action level shall conduct WQP monitoring beginning in the first calendar quarter following the calendar quarter in which the commission officially notified the water system of its exceedance status and shall continue monitoring and reporting as long as the water system exceeds the lead or copper action level.

(C) WQP monitoring shall be conducted quarterly for the following parameters: pH; alkalinity; calcium; conductivity; water temperature; orthophosphate (when an inhibitor containing a phosphate compound is used); and silica (when an inhibitor containing a silicate compound is used). Temperature and pH must be measured at the sampling site at the same time of sample collection.

(D) Large water systems must conduct WQP monitoring at all entry points and at the number of distribution sites specified in subsection (h)(1)(D) of this section, Table Number 2. Small and medium water systems that are required to conduct WQP monitoring must monitor at all entry points and at the required number of distribution sites as shown in subsection (h)(1)(D) of this section, Table Number 2.

Figure: 30 TAC §290.117(h)(1)(D)

TABLE NO. 2

SYSTEM SIZE (No. of people served)	INITIAL WQP DISTRIBUTION SITES	REDUCED WQP DISTRIBUTION SITES	NO. OF SITES FOR WQP MONITORING
>100,000	25	10	25
10,001 – 100,000	10	7	10
3,301 – 10,000	3	3	3
501 – 3,300	2	2	2
101 – 500	1	1	1
<101	1	1	1

(E) WQP distribution sites (exclusive of entry points) may be sites normally used for bacteriological monitoring and samples need not be collected inside the home. These sites shall be representative of water quality throughout the distribution system.

(F) After corrosion control treatment is installed, water quality parameters shall be measured at the initial number of distribution sites as indicated in subsection (h)(1)(D) of this section, Table Number 2 quarterly and also at entry points biweekly (every two weeks).

(G) WQP monitoring after corrosion control treatment is installed shall be conducted for the following parameters: pH; alkalinity; orthophosphate (when an inhibitor containing a phosphate compound is used); silica (when an inhibitor containing a silicate compound is used); and calcium (when calcium carbonate stabilization is used as part of the treatment). These parameters must be measured at all entry points and initial distribution sites.

(H) Any water system that maintains the range of values for WQP's reflecting optimum corrosion control as approved by the executive director for one-year may collect quarterly distribution samples at the reduced number of distribution sites indicated in subsection (h)(1)(D) of this section, Table Number 2. WQP samples shall continue to be measured at entry points on a biweekly basis and results submitted to the executive director.

(I) Any water system that reflects optimal corrosion control treatment during three consecutive years may reduce the frequency at which it collects distribution samples for applicable WQPs to annually.

(J) Any water system that reflects optimal corrosion control treatment during three consecutive years of annual WQP distribution monitoring may reduce the frequency at which it collects the number of WQP distribution samples for applicable WQPs to once every three years. Additionally, the last two consecutive tap sample monitoring periods must have a 90th percentile lead value of less than or equal to 0.005 mg/L and a 90th percentile copper value of less than or equal to 0.65 mg/L. The water system must also have maintained the range of values for WQPs reflecting optimal corrosion control as specified in that system's state approved corrosion control study.

(K) Water quality parameter testing must be conducted at a laboratory that uses the methods described in 40 CFR §141.89, and it is the responsibility of the water system to collect, submit, and report these values. If a water system fails to meet the WQP values or ranges specified by the executive director, it is out of compliance with this section. WQP values may be confirmed by the system

in accordance with 40 CFR §141.82(g). The state requires that the values be reported, but is not responsible for supplying sample bottles and testing services to the water system.

(L) Any water system subject to the reduced monitoring frequency that fails to operate within the approved range of WQP values shall resume distribution sampling in accordance with the number and frequency requirements in subparagraph (F) of this paragraph.

(M) A water system conducting WQP monitoring may limit entry point sampling to each official entry point as designated in the database for Safe Drinking Water Act (SDWA) compliance sampling. The water system must monitor WQPs at all entry points regardless of whether corrosion control treatment is required at all entry points or not. The water system must inform the executive director of the identity of treated and non-treated entry points and their seasonal use, if any, and demonstrate that the WQPs represent water quality and treatment conditions throughout the system.

(N) Any water system subject to reduced monitoring frequency (which has completed installation of approved corrosion control treatment as proposed in the system's corrosion control study) that fails to operate at or above the minimum range of values the system proposed for more than nine days in a six-month period shall resume distribution WQP sampling in accordance with the number and frequency requirements in this subsection. The system may resume distribution WQP sampling at the reduced number of sites as specified in this subsection after completing two consecutive six-month periods of distribution WQP sampling at the original frequency and then may follow subparagraphs (H) and (J) of this paragraph.

(O) Large water systems shall monitor applicable WQPs every calendar quarter beginning after installation of corrosion control treatment approved by the executive director. Small and medium water systems shall monitor WQPs every calendar quarter while the system is in exceedance status. The executive director will issue a reporting waiver to small and medium systems for WQPs after the system completes two follow-up rounds of tap sampling without exceeding either the lead or copper action level. The water system will continue to collect and record certain crucial parameters that will be available for inspection. If a small or medium water system exceeds the lead or copper action level during a reduced tap monitoring round (summer monitoring), the system shall conduct WQP monitoring until the exceedance status is resolved.

(P) The commission will not designate WQP ranges for any large water system that did not exceed 0.005 mg/L at the 90th percentile for lead during either initial tap sampling round. The commission will not designate WQP ranges for any small or medium water system that never exceeded the lead or copper action level at the 90th percentile during either initial tap sampling round or any reduced monitoring tap sampling round. Systems that must conduct WQP monitoring shall submit proposed WQP ranges for the executive director's approval.

(Q) Using WQPs proposed by the water system or its representatives, the commission will issue an approval letter if the corrosion control study and treatment proposed meet the requirements of this rule. Water systems will operate within the approved WQP ranges at all times and will conduct lead and copper tap sampling under the requirements in subsection (c) of this section and WQP reporting in this paragraph.

(2) Entry point water sampling.

(A) Entry point water sampling for lead and copper shall be conducted by systems that exceed the lead or copper action levels to determine the lead or copper content of source water. Entry point water samples shall be collected using sample location, number of samples, and collection methods as specified in §290.106 of this title (relating to Inorganic Contaminants). A large water system is deemed to have optimized corrosion control if it submits results of tap water monitoring conducted according to the requirements in subsection (c) of this section and results of source water monitoring conducted according to requirements in §290.106 of this title (relating to Inorganic Contaminants). The results must demonstrate for a 12-month monitoring period that lead at the 90th percentile is less than or equal to 0.005 mg/L.

(B) The executive director shall complete an evaluation of all entry point water sample results, along with the corrosion control study, to determine if source water treatment is necessary. If source water treatment is deemed necessary by the executive director, the system must install it in accordance with the scheduling requirements specified in 40 CFR §141.83(a).

(C) Any system that installs entry point water treatment shall collect an additional round of source water samples as described in subparagraph (A) of this paragraph during two consecutive six-month periods within 36 months after source water treatment begins.

(D) The monitoring frequency for lead and copper in source water, after the executive director determines that source water treatment is not required, or after the executive director

has specified the maximum permissible source water levels for lead and copper, shall be in accordance with inorganic chemical monitoring practices and procedures as stated in §290.106 of this title.

(E) Reduced source water monitoring procedures as specified in 40 CFR §141.88(e) for lead and copper will be followed by the executive director.

(F) All water systems shall notify the executive director in writing of any proposed change in treatment or the addition or deletion of a source of water. The executive director may require any such system to conduct additional monitoring or to take other action the executive director deems appropriate to ensure that such systems maintain minimal levels of corrosion in the distribution system.

(i) Public education requirements.

(1) A water system that exceeds the lead action level at the 90th percentile tap sample shall deliver to the public the public education materials listed in 40 CFR §141.85(a), and according to the requirements in paragraph (2) of this subsection shall provide copies of the public education materials to the executive director within ten days after the delivery of the materials to the public.

(2) A community water system shall, within 60 days of notification by the commission:

(A) insert notices in each customer's water utility bill or by separate mailing, if approved in writing by the executive director, that includes the information in 40 CFR §141.85(a), and

print the following alert on the water bill itself, or on a bill insert, in large print: "SOME HOMES IN THIS COMMUNITY HAVE ELEVATED LEAD LEVELS IN THEIR DRINKING WATER. LEAD CAN POSE A SIGNIFICANT RISK TO YOUR HEALTH. PLEASE READ THE ENCLOSED NOTICE FOR FURTHER INFORMATION.";

(B) submit the required information in 40 CFR §141.85(a) to the editorial departments of the major local daily or weekly newspaper circulated throughout the system;

(C) deliver pamphlets or brochures that contain the public education materials as specified in 40 CFR §141.85(a)(2) and (4) to city or county health departments, to public schools or local school boards, Women Infants and Children (WIC) or Head Start Programs when available, public and private hospitals or clinics, pediatricians, family planning clinics, and local welfare agencies, within their service area;

(D) submit the public service announcement in 40 CFR §141.85(b) to at least five radio or television stations broadcasting to the area served by the water system;

(E) a community water system serving 501 to 3,300 people may omit the task contained in subparagraph (D) of this paragraph;

(F) a community water system serving 500 or fewer people may omit the tasks contained in subparagraphs (B) - (D) of this paragraph;

(G) all community water systems must repeat the public education requirements every six months for as long as the system exceeds the lead action level; and

(H) if no lead service lines exist anywhere in the water system service area, all community water systems may delete information pertaining to lead service lines, and any additional information presented by a water system in the public education material shall be consistent with the information in 40 CFR §141.85(a) and be written in easily understood language.

(3) A nontransient noncommunity water system must within 60 days of notification by the executive director deliver the public education materials in 40 CFR §141.85(a)(2) as follows:

(A) post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system;

(B) distribute informational pamphlets and/or brochures on lead in drinking water to each person served by the water system. The commission may allow the water system to utilize electronic transmission in lieu of or combined with printed materials as long as it achieves at least the same coverage;

(C) a water system may delete or modify language relating only to community water systems that is not relevant to its particular facility; and

(D) a water system must repeat the tasks in subparagraphs (A) and (B) of this paragraph at least once during each calendar year for as long as the water system exceeds the lead action level.

(4) A water system may discontinue delivery of public education materials if the system has met the lead action level during the most recent six-month monitoring period. Such a system shall recommence public education in accordance with this section if it subsequently exceeds the lead action level during any monitoring period.

(5) A water system that fails to meet the lead action level as stated in subsection (a)(3) of this section shall make available to any customer who requests it, information as to how and where water samples may be submitted for lead and copper analysis.

(j) Corrosion control.

(1) All applicable water systems shall install and operate optimal corrosion control treatment, which means the corrosion control treatment that minimizes lead and copper concentrations at users' taps while insuring that the treatment does not cause the system to violate any other drinking water standard. All large water systems that exceeded 0.005 mg/L lead at the 90th percentile during initial monitoring or any system that exceeded the lead or copper action level at the 90th percentile during any tap monitoring sampling round and that has installed corrosion control treatment with approved WQP ranges, must operate and maintain optimal corrosion control within those ranges. Compliance periods for this paragraph are two six-month periods, January 1 to June 30, and July 1 to December 31. A water

system is out of compliance with this subsection for a six-month period if the water system has WQP excursions for any approved range for more than nine days. An excursion occurs whenever the daily value for one or more WQPs measured at a sampling location is below the minimum value or outside the range approved by the executive director. The executive director has the discretion to delete results of obvious sampling errors from this calculation. Daily values are calculated as follows.

(A) Water systems that collect more than one WQP measurement in one day must record the daily value as an average of all WQP values collected during the day regardless of whether the measurements are collected through continuous monitoring, grab sampling, or a combination of both.

(B) On days when only one measurement for the WQP is collected at the sampling location, the daily value shall be the result of that measurement.

(C) On days when no measurement is collected for the WQP at the sampling location, the daily value last calculated on the most recent day shall serve as the daily value.

(2) Large water systems (serving greater than 50,000 people) are required to conduct corrosion control studies unless they can demonstrate that corrosion control is already optimized to the satisfaction of the executive director. If required to conduct a corrosion control study, a large water system must complete it by July 1, 1994, and the executive director shall designate optimal corrosion control treatment and parameters by January 1, 1995. The water system shall install corrosion control treatment by January 1, 1997. Large water systems that exceed lead and/or copper action levels must

conduct a demonstration study as described in paragraph (4)(B) of this subsection. If a large water system exceeds either the lead or copper action level during a reduced tap sampling monitoring round, it will adhere to the schedule specified in the paragraph for medium systems, with time periods for completing each step being triggered by the date the executive director notifies the water system that it has exceeded an action level.

(3) Water systems are deemed to have optimized corrosion control if the water system meets the lead and copper action levels during each of two consecutive six-month monitoring periods. These systems will be required to conduct a desk-top corrosion control study to optimize corrosion control if at anytime the 90th percentile action level for lead and/or copper is exceeded. The study must be conducted and submitted within 12 months of a verified lead or copper exceedance. If a small or medium water system exceeds either the lead or copper action level during a reduced tap sampling monitoring round, it will adhere to the schedule specified in the paragraph for small and medium systems.

(4) Performance for corrosion control studies.

(A) Any public water system performing a corrosion control study shall evaluate the effectiveness of each of the following treatments (or combinations of treatments) to identify the optimal control treatment:

(i) alkalinity and pH adjustments;

(ii) calcium hardness adjustment; and

(iii) addition of phosphate or silicate corrosion inhibitor.

(B) The water system shall conduct this evaluation using either pipe rig/loop tests, metal coupon tests, partial systems tests (demonstration study), or analyses based on treatments in documented analogous systems (desk-top study). Analogous system means a system of similar size, water chemistry, and distribution system configuration.

(C) The water system shall measure the parameters listed in subsection (h)(1)(C) of this section.

(D) On the basis of the evaluation stated in subparagraphs (A) and (B) of this paragraph, the water system shall recommend to the executive director, in writing, the treatment option that constitutes optimum corrosion control or treatment along with sufficient documentation as required by the executive director to establish the validity of the evaluation procedure. Operational WQP ranges shall be proposed to the executive director where applicable.

(E) The executive director will, within six months after submittal of the corrosion control study by the water system, review the study and designate optimal corrosion control treatment and parameters.

(F) The water system shall install optimal corrosion control treatment within 24 months after the executive director designates optimal corrosion control treatment and notifies the water system.

(G) Large water systems that install corrosion control treatment shall conduct first-draw lead and copper tap sample monitoring as an initial monitoring during each of two consecutive six-month periods by January 1, 1998. Small and medium water systems shall complete the above stated monitoring within 36 months after the executive director designates optimal corrosion control treatment. Small and medium water systems are deemed to have optimized corrosion control if action levels for lead and copper are not exceeded in two rounds of subsequent tap sample monitoring. Large water systems are deemed to have optimized corrosion control if they have demonstrated through first-draw tap monitoring conducted after treatment installation and water quality parameter sampling conducted in compliance with standards set by the executive director for optimum corrosion control that they are operating within executive director-designated parameters.

(H) Any system that has received approval for a corrosion control study and demonstrates optimal corrosion control and operates in compliance with the executive director-designated optimal water quality parameters, may conduct reduced tap sampling as described in subsection (e) of this section, when written permission is granted by the executive director after the executive director has evaluated all pertinent data. Systems that do not meet the action levels for lead and copper after receiving approval for a corrosion control study must continue to operate in accordance with WQP requirements established by the executive director and follow procedures specified in subsection (e)(4) of this section.

(I) The executive director may modify, upon his own initiative or in response to a water system request or a request from interested parties, his designated corrosion control treatment or parameters. The request and executive director response pursuant to modification shall be in writing.

(5) Optimization of corrosion control.

(A) Any water system may be deemed by the executive director to have optimized corrosion control treatment if the system demonstrates, to the satisfaction of the executive director, that it has conducted activities equivalent to the corrosion control steps listed in paragraph (4) of this subsection.

(B) Any large water system is deemed to have optimized corrosion control if it submits results of lead and copper tap water monitoring and entry point water monitoring in accordance with this section which demonstrates for two consecutive six-month monitoring periods that the 90th percentile tap sample lead level is less than 0.005 mg/L.

(k) Lead service line replacement. The provisions of 40 CFR §141.84 relating to lead service line replacement are adopted by reference.

(l) Analytical and sample preservation methods.

(1) Analysis for lead and copper shall be conducted using methods stated in 40 CFR §141.89, in laboratories certified by the executive director. Analysis for pH, conductivity, calcium,

alkalinity, or the phosphate, silica, and temperature may be conducted in any laboratory utilizing EPA methods prescribed in 40 CFR §141.89.

(2) The Practical Quantitation Limits (PQL) and the Method Detection Limits (MDL) shall be as stated in 40 CFR §141.89. The laboratory certified for the analysis of lead and copper tap samples must achieve the MDL of 0.001 mg/L for lead if composted entry point water samples are analyzed for lead.

(3) The executive director has the authority to allow the use of previously collected monitoring data if the data were collected in accordance with 40 CFR §141.89.

(4) All lead levels measured between the PQL and the MDL must be reported as measured, and all lead levels measured below the MDL must be reported as zero.

(5) First-draw-tap samples must be received in the laboratory within 14 days after the collection date.

(m) Reporting and recordkeeping requirements.

(1) Reporting requirements.

(A) Report all results of WQP analyses including the location/address of each distribution system sampling point. This report must include each WQP specified in subsection (h) of this

section, as well as all sample results from entry points to the distribution system. Water Quality Parameter Reports should be submitted to the executive director no later than ten days after the end of each calendar quarter.

(B) Where applicable, the first-draw-tap monitoring shall be reported within ten days following the end of each monitoring period as specified by the executive director. (Analysis results from the approved laboratory are normally provided simultaneously to the water system and the executive director.) The results of first-draw-tap sampling shall be reported to the water system by the approved laboratory if the system's billing account is not delinquent. The executive director shall provide the water system with official notification of the results and the water system's calculated 90th percentile as the data is made available from the approved laboratory.

(C) As part of the site selection form, each water system shall justify the selection of sites other than Tier 1 sampling sites as defined on the site selection form and, if lead service lines are present, why the water system was not able to locate a sufficient number to make up at least 50% of its required number of sampling sites, should this condition arise.

(D) Where applicable, the water system must certify that source water treatment has been installed as recommended by the executive director and that installation was done in accordance with the specified time requirements.

(E) Where applicable, the water system must certify that lead service lines have been replaced in accordance with directives of the executive director and in accordance with time schedules specified in subsection (k) of this section.

(F) Where applicable, the water system must provide copies of public education materials and certification that distribution of said materials is being conducted in accordance with subsection (i) of this section.

(G) A water system must collect tap samples from the same sampling sites selected during the initial monitoring period for all subsequent sampling periods. If a water system changes a sampling site for any reason allowed in this section, the water system must provide the executive director with a written explanation showing which sampling site will be abandoned and the sampling site that replaces the abandoned sampling site. The water system's report shall include an explanation as to why a sampling site was changed from the previous round of sampling, if applicable. If a water system discovers that a sample has been collected at an inappropriate sampling site, the water system may request in writing that the sample be invalidated. The executive director may invalidate the sample and allow for recollection. If a water system has no sampling sites available that meet the first draw criteria specified in subsection (c) of this section, they shall proceed in accordance with 40 CFR §141.90(a)(2).

(H) Corrosion control treatment data shall be reported as required by the executive director for water systems that:

(i) have demonstrated optimum corrosion control;

(ii) are required to specify optimum corrosion control treatment (as part of the corrosion control study);

(iii) install corrosion control treatment as designated by the executive director; and

(iv) are required to evaluate effectiveness of corrosion control treatments.

(2) Recordkeeping requirements. Records of all sampling site data, sample submission forms, analysis results, reports, surveys, letters, evaluations, schedules, executive director recommendations, requirements or determinations, and any other information deemed appropriate by the water system shall be retained by the water system for a minimum of 12 years. These records include, but are not limited to, the following items:

(A) tap water monitoring results including the location of each site and date of collection;

(B) certification of the volume and validity of first-draw-tap sample criteria via a copy of the laboratory analysis request form;

(C) where residents collected the sample, certification that the water system informed the resident of proper sampling procedures;

(D) the analytical results for lead and copper concentrations (provided to each water system by the executive director) at each tap sample site; and

(E) designation of any substitute site not used in previous monitoring periods.

§290.118. Secondary Constituent Levels.

(a) Applicability for secondary constituents. The requirements for secondary constituents apply to all public water systems. Water that does not meet the secondary constituent levels may not be used for public drinking water without written approval from the executive director. When drinking water that does not meet the secondary constituent levels is accepted for use by the executive director, such acceptance is valid only until such time as water of acceptable chemical quality can be made available at reasonable cost to the area(s) in question.

(b) Secondary constituent levels. The maximum secondary constituent levels are as follows.

Figure: 30 TAC §290.118(b)

CONSTITUENT	LEVEL (mg/l except where otherwise stated)
Aluminum	0.05 to 0.2
Chloride	300
Color	15 color units
Copper	1.0
Corrosivity	Non-corrosive
Fluoride	2.0
Foaming agents	0.5
Hydrogen sulfide	0.05
Iron	0.3
Manganese	0.05
Odor	3 Threshold Odor Number
pH	> 7.0
Silver	0.1
Sulfate	300
Total Dissolved Solids	1,000
Zinc	5.0

(c) Monitoring frequency for secondary constituents. All public water systems shall monitor for secondary constituents at the following frequency.

(1) Each groundwater source shall be sampled once every three years at the entry point to the distribution system.

(2) Each surface water source shall be sampled annually at the entry point to the distribution system.

(3) Each of the sampling frequencies listed in paragraph (3) of this subsection constitute one round of sampling for groundwater and surface water systems, respectively.

(d) Analytical requirements for secondary constituents. All analyses for determining compliance with the provisions of this subsection shall be conducted in accordance with §290.119 of this title (relating to Analytical Procedures) at a facility certified by the executive director.

(e) Reporting requirements for secondary constituents. Any owner or operator of a public water system subject to the provisions of this section is required to report to the executive director the results of any test, measurement, or analysis required to be made by this section within ten days following receipt of results of such test, measurement, or analysis.

(f) Compliance determination for secondary constituents. Compliance with the requirements of this subsection shall be based on the following criteria:

(1) A public water system that fails to conduct the monitoring tests required by this subsection commits a monitoring violation;

(2) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation; and

(3) A public water system that exceeds the secondary constituent levels in subsection (b) of this section commits a secondary constituents level violation.

(g) Public notification for secondary constituents. Public notification must be consistent with the requirements of §290.122 of this title (relating to Public Notification).

(1) Community and nontransient, noncommunity water systems that exceed the secondary maximum constituent level for fluoride but are below the maximum contaminant level listed in §290.106 of this title (relating to Inorganic Contaminants) must notify the public. The notice must be made annually by including it with the water bill or by separate mailing to all customers. The form and content of the notice shall be as prescribed by the executive director.

(2) If a system exceeds the secondary constituent levels, notice must be given to new customers and in the annual consumer confidence report.

§290.119. Analytical Procedures.

(a) Acceptable laboratories. Samples collected to determine compliance with the requirements of this subchapter shall be analyzed at certified or approved laboratories.

(1) Samples used to determine compliance with the maximum contaminant levels, and action level requirements of this subchapter must be analyzed by a laboratory certified by the executive director in accordance with Chapter 25 of this title (relating to Environmental Testing Laboratory Accreditation and Certification). These samples include:

(A) compliance samples for SOCs;

(B) compliance samples for VOCs;

(C) compliance samples for inorganic contaminants;

(D) compliance samples for radiological contaminants;

(E) compliance samples for microbial contaminants;

(F) compliance samples for TTHM;

(G) compliance samples for HAA5;

(H) compliance samples for chlorite;

(I) compliance samples for bromate; and

(J) compliance samples for lead and copper.

(2) Samples used to determine compliance with the treatment technique requirements and MRDLs of this subchapter must be analyzed by a laboratory approved by the executive director. These samples include:

(A) compliance samples for turbidity treatment technique requirements;

(B) compliance samples for the chlorine MRDL;

(C) compliance samples for the chlorine dioxide MRDL;

(D) compliance samples for the combined chlorine (chloramine) MRDL;

(E) compliance samples for the disinfection by-product precursor treatment technique requirements, including alkalinity, total organic carbon, and specific ultraviolet absorbance;

(F) samples used to monitor chlorite levels at the point of entry to the distribution system; and

(G) samples used to determine pH.

(3) Non-compliance tests, such as control tests taken to operate the system, may be run in the plant or at a laboratory of the system's choice.

(b) Acceptable analytical methods. Methods of analysis shall be as specified in 40 Code of Federal Regulations (CFR) or by any alternative analytical technique as specified by the executive director and approved by the Administrator under 40 CFR §141.27. Copies are available for review in the

Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087. The following National Primary Drinking Water Regulations set forth in Title 40 CFR are adopted by reference:

(1) section 141.21(f) for microbiological analyses;

(2) section 141.74(a)(1) for turbidity analyses;

(3) section 141.23(k) for inorganic analyses;

(4) section 141.24(e), (f), and (g) for organic analyses;

(5) section 141.25 for radionuclide analyses;

(6) section 141.131(a) and 141.131(b) for disinfection by-product methods and analyses;

(7) section 141.131(c) for disinfectant analyses other than ozone, and 141.74(b) for ozone disinfectant;

(8) section 141.131(d) for alkalinity analyses, bromide and magnesium, total organic carbon analyses, specific ultraviolet absorbance analyses, and pH analyses; and

(9) section 141.89 for lead and copper analyses and for water quality parameter analyses that are performed as part of the requirements for lead and copper.

(c) The definition of detection contained in 40 CFR §141.151(d) is adopted by reference.

§290.121. Monitoring Plans.

(a) Applicability. All public water systems shall maintain an up-to-date chemical and microbiological monitoring plan. Monitoring plans are subject to the review and approval of the executive director. A copy of the monitoring plan must be maintained at each water treatment plant and at a central location.

(b) Monitoring plan requirements. The monitoring plan shall identify all sampling locations, describe the sampling frequency, and specify the analytical procedures and laboratories that the public water system will use to comply with the monitoring requirements of this subchapter.

(1) The monitoring plan shall include information on the location of all required sampling points in the system. Required sampling locations for regulated chemicals are provided in §290.106 of this title (relating to Inorganic Contaminants), §290.107 of this title (relating to Organic Contaminants), §290.108 of this title (relating to Radionuclides Other than Radon), §290.109 of this title (relating to Microbial Contaminants), §290.110 of this title (relating to Disinfectant Residuals), §290.111 of this title (relating to Surface Water Treatment), §290.112 of this title (relating to Total Organic Carbon (TOC)), §290.113 of this title (relating to Stage 1 Disinfection By-products (TTHM and HAA5)), §290.114 of this

title (relating to Other Disinfection By-products (Chlorite and Bromate)), §290.115 of this title (relating to Stage 2 Disinfection By-products (TTHM and HAA5)), §290.116 of this title (Relating to Groundwater Corrective Actions and Treatment Techniques), §290.117 of this title (relating to Regulation of Lead and Copper), and §290.118 of this title (relating to Secondary Constituent Levels).

(A) The location of each sampling site at a treatment plant or pump station must be designated on a plant schematic. The plant schematic must show all water pumps, flow meters, unit processes, chemical feed points, and chemical monitoring points. The plant schematic must also show the origin of any flow stream that is recycled at the treatment plant, any pretreatment that occurs before the recycle stream is returned to the primary treatment process, and the location where the recycle stream is reintroduced to the primary treatment process.

(B) Each entry point to the distribution system shall be identified in the monitoring plan as follows:

(i) a written description of the physical location of each entry point to the distribution system shall be provided; or

(ii) the location of each entry point shall be indicated clearly on a distribution system or treatment plant schematic.

(C) The address of each sampling site in the distribution system shall be included in the monitoring plan or the location of each distribution system sampling site shall be designated on a distribution system schematic. The distribution system schematic shall clearly indicate the following:

(i) the location of all pump stations in the distribution system;

(ii) the location of all ground and elevated storage tanks in the distribution system; and

(iii) the location of all chemical feed points in the distribution system.

(D) The system must revise its monitoring plan if changes to a plant or distribution system require changes to the sampling locations.

(2) The monitoring plan must include a written description of sampling frequency and schedule.

(A) The monitoring plan must include a list of all routine samples required on a daily, weekly, monthly, quarterly, annual, or less frequent basis and identify the sampling location where the samples will be collected.

(B) The system must maintain a current record of the sampling schedule.

(3) The monitoring plan must identify the analytical procedures that will be used to perform each of the required analyses.

(4) The monitoring plan must identify all laboratory facilities that may be used to analyze samples required by this chapter.

(5) The monitoring plan shall include a written description of the methods used to calculate compliance with all maximum contaminant levels, maximum residual disinfectant levels, and treatment techniques that apply to the system.

(6) The monitoring plan shall include any groundwater source water monitoring plan developed under §290.109(c)(4) of this title (relating to Microbial Contaminants) to specify well sampling for triggered coliform monitoring.

(7) The monitoring plan shall include any initial distribution system evaluation compliance documentation required by §290.115(c)(5) of this title (relating to Stage 2 Disinfection By-products (TTHM and HAA5)). The monitoring plan must be revised to show Stage 2 sample sites by the date shown in Figure: 30 TAC §290.115(a)(2) titled "Date to Start Stage 2 Compliance."

(8) The monitoring plan shall include any raw surface water monitoring plan required under §290.111 of this title (relating to Surface Water Treatment).

(c) Reporting requirements. All public water systems shall maintain a copy of the current monitoring plan at each treatment plant and at a central location. The water system must update the monitoring plan when the water system's sampling requirements or protocols change.

(1) Public water systems that treat surface water or groundwater under the direct influence of surface water must submit a copy of the monitoring plan to the executive director upon development and revision.

(2) Public water systems that treat groundwater that is not under the direct influence of surface water or purchase treated water from a wholesaler must develop a monitoring plan and submit a copy of the monitoring plan to the executive director upon request.

(3) All water systems must provide the executive director with any revisions to the plan upon request.

(d) Compliance determination. Compliance with the requirements of this section shall be determined using the following criteria.

(1) A public water system that fails to submit an administratively complete monitoring plan by the required date or fails to submit updates to a plan when required commits a reporting violation.

(2) A public water system that fails to maintain an up-to-date monitoring plan commits a monitoring violation.

(e) Public notification. A system that commits a violation described in §290.122(d) of this title (relating to Public Notification) shall notify its customers of the violation in the next consumer confidence report that is issued by the system.

§290.122. Public Notification.

(a) Public notification requirements for acute violations. The owner or operator of a public water system must notify persons served by their system of any maximum contaminant limit (MCL), maximum residual disinfectant level (MRDL), or treatment technique violation that poses an acute threat to public health. Each notice required by this section must meet the requirements of subsection (d) of this section.

(1) Violations that pose an acute threat to public health include:

(A) a violation of the acute MCL for microbial contaminants as defined in §290.109(f)(1) of this title (relating to Microbial Contaminants);

(B) an acute turbidity issue at a treatment plant that is treating surface water or groundwater under the direct influence of surface water, specifically:

(i) a combined filter effluent turbidity level above 5.0 nephelometric turbidity units (NTU);

(ii) a combined filter effluent turbidity level above 1.0 NTU at a treatment plant using membrane filters; or

(iii) a combined filter effluent turbidity level above 1.0 NTU at a plant using other than membrane filters at the discretion of the executive director after consultation with the system; or

(iv) failure of a system with treatment other than membrane filters to consult with the executive director within 24 hours after a combined filter effluent ready of 1.0 NTU;

(C) a violation of the MCL for nitrate or nitrite as defined in §290.106(f)(2) of this title (relating to Inorganic Contaminants);

(D) a violation of the acute MRDL for chlorine dioxide as defined in §290.110(f)(5)(A) or (B) of this title (relating to Disinfectant Residuals);

(E) occurrence of a waterborne disease outbreak;

(F) Detection of *E. coli* or other fecal indicators in source water samples as specified in §290.109(b)(2) of this title (relating to Microbial Contaminants); and

(G) other violations deemed by the executive director to pose an acute risk to human health.

(2) The initial acute public notice and boil water notice required by this subsection shall be issued as soon as possible, but in no case later than 24 hours after the violation is identified. The initial public notice for an acute violation shall be issued in the following manner.

(A) The owner or operator of a water system with an acute microbiological or turbidity violation as described in paragraph (1)(A) or (B) of this subsection shall include a boil water notice issued in accordance with the requirements of §290.46(q) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems).

(B) The owner or operator of a community water system shall furnish a copy of the notice to the radio and television stations serving the area served by the public water system.

(C) The owner or operator of a community water system shall publish the notice in a daily newspaper of general circulation in the area served by the system. If the area is not served by a daily newspaper of general circulation, notice shall instead be issued by direct delivery or by continuous posting in conspicuous places within the area served by the system.

(D) The owner or operator of a noncommunity water system shall issue the notice violation by direct delivery or by continuously posting the notice in conspicuous places within the area served by the water system.

(E) If notice is provided by posting, the posting must remain in place for as long as the violation exists or seven days, whichever is longer.

(3) The owner or operator of a water system required to issue an initial notice for an acute MCL or treatment technique violation shall issue additional notices. The additional public notices for acute violations shall be issued in the following manner.

(A) Not later than 45 days after the violation, the owner or operator of a community water system shall notify persons served by the system using mail (by direct mail or with the water bill) or hand delivery. The executive director may waive mail or hand delivery if it is determined that the violation was corrected within the 45-day period. The executive director must make the waiver in writing and within the 45-day period.

(B) The owner or operator of a community water system must issue a notice at least once every three months by mail delivery (by direct mail or with the water bill) or by hand delivery, for as long as the violation exists.

(C) If the owner or operator of a noncommunity water system issued the initial notice by continuous posting, posting must continue for as long as the violation exists and in no case less than seven days. If the owner or operator of a noncommunity water system issued the initial notice by direct delivery, notice by direct delivery must be repeated at least every three months for as long as the violation exists.

(4) The owner or operator of the public water system must issue a notice when the public water system has corrected the acute violation. This notice must be issued in the same manner as the original notice was issued.

(5) Copies of all notifications required under this subsection must be submitted to the executive director within ten days of its distribution.

(b) Public notification requirements for other MCL, MRDL, or treatment technique violations and for variance and exemption violations. The owner or operator of a public water system must notify persons served by their system of any MCL, MRDL, or treatment technique violation other than those described in subsection (a)(1) of this section and of any violation involving a variance or exemption requirement. Each notice required by this section must meet the requirements of subsection (d) of this section.

(1) Violations that require notification under this subsection include:

(A) any violation of an MCL, MRDL, or treatment technique not listed under subsection (a) of this section;

(B) failure to comply with the requirements of any variance or exemption granted under §290.102(d) of this title (relating to General Applicability);

(C) failure for a groundwater system to take corrective action or failure to maintain at least 4-log treatment of viruses (using inactivation, removal, or a combination of 4-log virus inactivation and removal approved by the executive director) before or at the first customer under §290.116 of this title; or

(D) failure to perform any 3 months of raw surface water monitoring as required by §290.111(b) of this title or request bin classification from the executive director under §290.111(c)(3)(A) of this title; or

(E) other violations deemed appropriate by the executive director that pose a non-acute risk to human health.

(2) The initial public notice for any violation identified in this subsection must be issued as soon as possible, but in no case later than 30 days after the violation is identified. The initial public notice shall be issued in the following manner.

(A) The owner or operator of a community water system shall issue the notice by:

(i) mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system; and

(ii) any other method reasonably calculated to reach other persons regularly served by the system, if they would not normally be reached by the notice required in clause (i) of this subparagraph. Such persons may include those who do not pay water bills or do not have service connection addresses (e.g., house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.) Other methods may include: publication in a local newspaper; delivery of multiple copies for distribution by customers that provide drinking water to others (e.g., apartment building owners or large private employers); continuous posting in conspicuous public places within the area served by the system or on the Internet; or delivery to community organizations.

(B) The owner or operator of a noncommunity water system shall issue the notice by direct delivery or by continuously posting the notice in conspicuous places within the area served by the system.

(C) If notice is provided by posting, the posting must remain in place for as long as the violation exists or seven days, whichever is longer.

(3) The owner or operator of a system required to issue an initial violation notice shall issue additional notices. The additional notices shall be issued in the following manner.

(A) The owner or operator of a community water system must issue a notice at least once every three months by mail delivery (by direct mail or with the water bill) or by direct delivery, for as long as the violation exists.

(B) If the owner or operator of a noncommunity water system issued the initial notice by continuously posting the notice, the posting must continue for as long as the violation exists, and in no case less than seven days. If the owner or operator of a noncommunity water system issued the initial notice by direct delivery, notice by direct delivery must be repeated at least every three months for as long as the violation exists.

(4) The owner or operator of the public water system must issue a notice when the public water system has corrected the violation. This notice must be issued in the same manner as the original notice was issued.

(c) Public notification requirements for other violations, variances, exemptions. The owner or operator of a public water system who fails to perform monitoring required by this chapter, fails to comply with a testing procedure established by this chapter, or is subject to a variance or exemption granted under §290.102(b) of this title shall notify persons served by the system. Each notice required by this section must meet the requirements of subsection (d) of this section.

(1) Violations that require notification as described in this section include:

(A) exceedance of the secondary constituent levels (SCL) for fluoride ;

(B) failure to perform monitoring or reporting required by this subchapter;

(C) failure to comply with the analytical requirements or testing procedures required by this subchapter;

(D) operating under a variance or exemption granted under §290.102(b) of this title; and

(E) failure to maintain records on recycle practices as required by §290.46(f)(3)(C)(iii) of this title.

(2) The initial public notice issued pursuant to this section shall be issued within three months of the violation or the granting of a variance or exemption. The initial public notice shall be issued in the following manner.

(A) The owner or operator of a community water system shall publish the notice in a daily newspaper of general circulation in the area served by the system. If the area served by the public water system is not served by a daily newspaper of general circulation, the notice shall instead be published in a weekly newspaper of general circulation serving the area. If the area is not served by a either a daily or weekly newspaper of general circulation, notice shall instead be given by direct delivery or by continuous posting in conspicuous places within the area served by the system.

(B) The owner or operator of a noncommunity water system shall issue the notice by direct delivery or by continuously posting the notice in conspicuous places within the area served by the system.

(C) If notice is provided by posting, the posting must remain in place for as long as the violation exists or seven days, whichever is longer.

(3) The owner or operator of a system required to issue an initial violation notice shall issue additional notices. The additional notices shall be issued in the following manner.

(A) The owner or operator of a community water system shall issue repeat notices at least once every 12 months by mail delivery (by direct mail or with the water bill) or by hand delivery, for as long as the violation exists or variance or exemption remains in effect. Repeat public notice may be included as part of the Consumer Confidence Report.

(B) If the owner or operator of a noncommunity water system issued the initial notice by continuously posting the notice, the posting must continue for as long as the violation exists, and in no case less than seven days. If the owner or operator of a noncommunity water system issued the initial notice by direct delivery, notice by direct delivery must be repeated at least every three months for as long as the violation exists.

(4) The owner or operator of the public water system must issue a notice when the public water system has corrected the violation. This notice must be issued in the same manner as the original notice was issued.

(d) Each public notice must conform to the following general requirements.

(1) The notice must contain a clear and readily understandable explanation of the violation or situation that lead to the notification. The notice must not contain very small print, unduly technical language, or other items that frustrate the purpose of the notice.

(2) If the notice is required for a specific event, it must state when the event occurred.

(3) For notices required under subsections (a), (b), or (c)(1)(A) of this section, the notice must describe potential adverse health effects.

(A) For MCL, MRDL, or treatment technique violations, the notice must contain the mandatory federal contaminant-specific language contained in 40 Code of Federal Regulations (CFR) Subpart Q, Appendix B, in addition to any language required by the executive director.

(B) For fluoride SCL violations, the notice must contain the mandatory federal contaminant-specific language contained in 40 CFR §141.208, in addition to any language required by the executive director.

(C) For failure to perform any 3 months of raw surface water monitoring or request bin classification from the executive director, the notice must contain the mandatory federal contaminant specific language contained in 40 CFR §141.211(d)(1) and 40 CFR §141.211(d)(2), respectively, in addition to any language required by the executive director.

(D) The notice must describe the population at risk, especially subpopulations particularly vulnerable if exposed to the given contaminant.

(4) The notice must state what actions the water system is taking to correct the violation or situation, and when the water system expects to return to compliance.

(5) The notice must state whether alternative drinking water sources should be used, and what other actions consumers should take, including when they should seek medical help, if known.

(6) Each notice must contain the telephone number at which consumers may contact the owner, operator, or designee of the public water system for additional information concerning the notice.

(7) Where appropriate, the notice must be multilingual.

(8) The notice shall include a statement to encourage the notice recipient to distribute the public notice to the other persons served.

(9) Systems with variances or exemptions must notify in accordance with 40 CFR §141.205(b).

(e) Notice to new billing units. The owner or operator of a community water system must give a copy of the most recent public notice for any outstanding violation of any MCL, or any treatment

technique requirement, or any variance or exemption schedule to all new billing units or new hookups prior to or at the time service begins.

(f) Proof of public notification. A copy of any public notice required under this section must be submitted to the executive director within ten days of its distribution as proof of public notification. The copies must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087. Each proof of public notification must be accompanied with a signed Certificate of Delivery.

(g) Notice to consecutive systems. A public water system that is required to notify its customers must also provide a copy of the notification to any public water systems that purchase or otherwise receive water from it in the same manner in which they inform their customers. Each public water system that is affected by the subject of the notification is responsible for notification to its own customers.

(h) Notices given by the executive director. The executive director may give the notice required by this section on behalf of the owner and operator of the public water system following the requirements of this section. The owner or operator of the public water system remains responsible for ensuring that the requirements of this section are met.

(i) If a public water system has a violation in a portion of the distribution system that is physically or hydraulically isolated from other parts of the distribution system, the executive director may allow the system to limit distribution of the public notice to only persons served by that portion of the system which

is out of compliance. Permission by the executive director for limiting distribution of the notice must be granted in writing.

SUBCHAPTER H: CONSUMER CONFIDENCE REPORTS

§§290.272, 290.273, 290.275

STATUTORY AUTHORITY

These amendments are adopted under Texas Water Code (TWC), §5.102, which establishes the commission's general authority necessary to carry out its jurisdiction; §5.103, which establishes the commission's general authority to adopt rules; §5.105, which establishes the commission's authority to set policy by rule; and Texas Health and Safety Code (THSC), §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 United States Code, §§300f to 300j-26;and THSC, §341.0315, which requires public water systems to comply with commission rules adopted to ensure the supply of safe drinking water.

The adopted amendments implement TWC, §5.102, §5.103, §5.105, THSC, §341.031, and §341.0315.

§290.272. Content of the Report.

(a) Information on the source of the water delivered must be included in the report.

(1) Each report must identify the source(s) of the water delivered by the community water system by providing information on the type of the water (such as surface water or groundwater) and any commonly used name and location of the body(ies) of water.

(2) If a source water assessment has been completed, the report must notify consumers of the availability of this information and the means to obtain it. In the reports, systems should highlight significant sources of contamination in the source water area if they have readily available information.

(3) If a system has received a source water assessment from the executive director, the report must include a brief summary of the system's susceptibility to potential sources of contamination using language provided by the executive director or written by a water system official and approved by the executive director.

(b) The following explanations must be included in the annual report.

(1) Each report must contain the following definitions.

(A) **Maximum contaminant level goal (MCLG)--**The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

(B) **Maximum contaminant level (MCL)--**The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to maximum contaminant level goals as feasible using the best available treatment technology.

(C) **Maximum residual disinfectant level goal (MRDLG)**--The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

(D) **Maximum residual disinfectant level (MRDL)**--The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

(2) The following terms and their descriptions must be included when they appear in the report:

(A) **MFL**--million fibers per liter (a measure of asbestos);

(B) **mrem/year**--millirems per year (a measure of radiation absorbed by the body);

(C) **NTU**--nephelometric turbidity units (a measure of turbidity);

(D) **pCi/L**--picocuries per liter (a measure of radioactivity);

(E) **ppb**--parts per billion, or micrograms per liter (μ/L);

(F) **ppm**--parts per million, or milligrams per liter (mg/L);

(G) **ppt**--parts per trillion, or nanograms per liter (ng/L); and

(H) **ppq**--parts per quadrillion, or picograms per liter (pg/L).

(3) A report for a community water system operating under a variance or an exemption of the Safe Drinking Water Act must include a description of the variance or the exemption granted under §290.102(b)(4) of this title (relating to General Applicability).

(4) A report that contains data on a contaminant for which the United States Environmental Protection Agency (EPA) has set a treatment technique or an action level must include, depending on the contents of the report, the following definitions.

(A) **Treatment technique (TT)**--A required process intended to reduce the level of a contaminant in drinking water.

(B) **Action level (AL)--**The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

(c) Information on detected contaminants.

(1) This subsection specifies the requirements for information to be included in each report for detected contaminants subject to mandatory monitoring, excluding *Cryptosporidium.* Mandatory monitoring is required for:

(A) regulated contaminants subject to an MCL, MRDL, action level, or treatment technique;

(B) unregulated contaminants for which monitoring is required by 40 Code of Federal Regulations (CFR) §141.40, relating to Unregulated Contaminants and found in §290.275(4) of this title (relating to Appendices A - D); and

(C) disinfection by-products or microbial contaminants for which monitoring is required by 40 CFR §141.142, relating to Information Collection Requirements (ICR) for Public Water System--Disinfection by-product and related monitoring, and 40 CFR §141.143, relating to Microbial Monitoring Requirements.

(2) The data relating to these detected contaminants must be displayed in one table or in several adjacent tables. Any additional monitoring results that a community water system chooses to include in its reports must be displayed separately.

(3) The data must be derived from data collected to comply with EPA and the commission monitoring and analytical requirements during the previous calendar year, except when a system is allowed to monitor for regulated contaminants less often than once per year. In that case, the

table(s) must include the date and results of the most recent sampling, and the report must include a brief statement indicating that the data presented in the report is from the most recent testing done in accordance with the regulations. The report does not need to include data that is older than five years. Furthermore, results of monitoring in compliance with 40 CFR §141.142 and §141.143 need only be included for five years from the date of the last sample or until any of the detected contaminants becomes regulated and subject to routine monitoring requirements, whichever comes first.

(4) For detected regulated contaminants listed under §290.275 of this title, the table(s) must contain:

(A) the MCLs for those contaminants expressed as a number equal to or greater than 1.0 (as provided under §290.275 of this title);

(B) the MCLGs for those contaminants expressed in the same units as the MCLs (as provided for under §290.275 of this title);

(C) if there is no MCL for a detected contaminant, the treatment technique or specific action level applicable to that contaminant; and

(D) for contaminants subject to an MCL, except turbidity and total coliforms, the highest contaminant level used to determine compliance with National Primary Drinking Water Regulations and the range of detected levels.

(i) For contaminants subject to MCLs, except turbidity and total coliforms, when sampling takes place once per year or less often, the table(s) must contain the highest detected level at any sampling point and the range of detected levels expressed in the same units as the MCL.

(ii) When sampling takes place more than once per year at each sampling point, the table(s) must contain the highest average of any of the sampling points and the range of all sampling points expressed in the same units as the MCL.

(iii) For the MCLs for trihalomethanes (TTHM) and haloacetic acids (HAA5), systems must include the highest locational running annual average for TTHM and HAA5 and the range of individual sample results for all monitoring locations expressed in the same units as the MCL. If more than one location exceeds the TTHM or HAA5 MCL, the system must include the locational running annual averages for all sampling points that exceed the MCL.

(iv) When compliance with any MCL is determined on a system-wide basis by calculating a running annual average of all samples at all sampling points, the table(s) must include the average and range of detections expressed in the same units as the MCL.

(v) When the executive director allows the rounding of results to determine compliance with the MCL, rounding should be done after multiplying the results by the factor listed under §290.275 of this title.

(E) When turbidity is reported under §290.111 of this title (relating to Surface Water Treatment), the table(s) must contain the highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits specified in that section for the filtration technology being used. The report should include an explanation of the reasons for measuring turbidity.

(F) When lead and copper are reported, the table(s) must contain the 90th percentile value of the most recent round of sampling and the number of sampling sites exceeding the action level.

(G) When total coliform is reported, the table(s) must contain either the highest monthly number of positive samples for systems collecting fewer than 40 samples per month or the highest monthly percentage of positive samples for systems collecting at least 40 samples per month.

(H) When fecal coliform is reported, the table(s) must contain the total number of positive samples.

(I) The table(s) must contain information on the likely source(s) of detected contaminants based on the operator's knowledge. Specific information regarding contaminants may be available in sanitary surveys or source water assessments and should be used when available. If the operator lacks specific information on the likely source, the report must include one or more typical sources most applicable to the system for any particular contaminant listed under §290.275 of this title.

(i) If a community water system distributes water to its customers from multiple hydraulically independent distribution systems that are fed by different raw water sources, the table(s) must contain a separate column for each service area, and the report must identify each separate distribution system. Systems may produce separate reports tailored to include data for each service area.

(ii) The table(s) must clearly identify any data indicating violations of MCLs, MRDLs, or treatment techniques. The report must contain a clear and readily understandable explanation of the violation. The explanation must include the length of the violation, the potential adverse health effects, and the actions taken by the system to address the violation. To describe the potential health effects, the system must use the relevant language contained under §290.275 of this title.

(5) For detected unregulated contaminants found under §290.275 of this title, for which monitoring is required (except *Cryptosporidium*), the table(s) must contain the average and range of concentrations at which the contaminant was detected. The report must include the following explanation: "Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted."

(d) Information on *Cryptosporidium*, radon, and other contaminants.

(1) If the system has performed any monitoring for *Cryptosporidium*, the report must include a summary of the results of any detections and an explanation of the significance of the results.

(2) If the system has performed any monitoring for radon, which indicates that radon may be present in the finished water, the report must include the results of the monitoring and an explanation of the significance of the results.

(3) If the system has performed additional monitoring, which indicates the presence of other contaminants in the finished water, the executive director strongly encourages systems to report any results which may indicate a health concern. To determine if the results may indicate a health concern, the executive director recommends that systems find out if the EPA has proposed a standard in the *National Primary Drinking Water Regulations* (NPDWR) or issued a health advisory for any particular contaminant. This information may be obtained by calling the Safe Drinking Water Hotline at (800) 426-4791. The executive director considers detections that are above a proposed MCL or health advisory level to indicate possible health concerns. For such contaminants, the executive director recommends that the report include the results of the monitoring and an explanation of the significance of the results. The explanation should note the existence of a health advisory or a proposed regulation.

(e) Compliance with NPDWR. In addition to the requirements in subsection (c)(4)(I)(ii) of this section, the report must note any violation that occurred during the year covered by the report of a requirement listed in paragraphs (1) - (8) of this subsection.

(1) The report must include a clear and readily understandable explanation of each violation of monitoring and reporting of compliance data and explain any adverse health effects and steps the system has taken to correct the violation.

(2) The report must include a clear and readily understandable explanation of each violation of filtration and disinfection prescribed by Subchapter F of this chapter (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems) and explain any adverse health effects and steps the system has taken to correct the violation. This applies both to systems that have failed to install adequate filtration, disinfection equipment, or processes, and to systems that have had a failure of such equipment or processes, each of which constitutes a violation. In either case, the report must include the following language as part of the explanation of potential adverse health effects: "Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches."

(3) The report must include a clear and readily understandable explanation of each violation of the lead and copper control requirements prescribed by §290.117 of this title (relating to Regulation of Lead and Copper). For systems that fail to take one or more actions prescribed by §290.117(g), (h), and (i) of this title, the report must include the applicable health effects language of §290.275(3) of this title for lead, copper, or both and the steps the system has taken to correct the violation.

(4) The report must include a clear and readily understandable explanation of each violation of treatment techniques for Acrylamide and Epichlorohydrin prescribed by §290.107 of this title (relating to Organic Contaminants). If a system violates these requirements, the report must include the relevant health effects language from §290.275 of this title and the steps the system has taken to correct the violation.

(5) The report must include a clear and readily understandable explanation of each violation of recordkeeping of compliance data and explain any adverse health effects and steps the system has taken to correct the violation.

(6) The report must include a clear and readily understandable explanation of each violation of special monitoring requirements for unregulated contaminants and special monitoring for sodium as prescribed by 40 CFR §141.40 and §141.41 and explain any adverse health effects and steps the system has taken to correct the violation.

(7) For systems required to conduct initial distribution sampling evaluation (IDSE) sampling in accordance with §290.115(c)(5) of this title (relating to Stage 2 Disinfection By-products (TTHM and HAA5)), the system is required to include individual sample results for the IDSE when determining the range of TTHM and HAA5 results to be reported in the annual consumer confidence report for the calendar year that the IDSE samples were taken.

(8) The report must include a clear and readily understandable explanation of each violation of the terms of a variance, exemption, administrative order, or judicial order and explain any adverse health effects and steps the system has taken to correct the violation.

(f) Variances and exemptions. If a system is operating under the terms of a variance or exemption issued under §290.102(b) of this title, the report must contain:

(1) an explanation of the variance or exemption;

(2) the date on which the variance or exemption was issued and on which it expires;

(3) a brief status report on the steps the system is taking, such as installing treatment processes or finding alternative sources of water, to comply with the terms and schedules of the variance or exemption; and

(4) a notice of any opportunity for public input as the review or renewal of the variance or exemption.

(g) Additional information.

(1) The report must contain a brief explanation regarding contaminants that may reasonably be expected to be found in drinking water (including bottled water). This explanation may include the language contained within subparagraphs (A) - (C) of this paragraph, or systems may include their own comparable language. The report must include the language of subparagraphs (D) and (E) of this paragraph.

(A) The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

(B) Contaminants that may be present in source water include:

(i) microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife;

(ii) inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

(iii) pesticides and herbicides, which might have a variety of sources such as agriculture, urban storm water runoff, and residential uses;

(iv) organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems; and

(v) radioactive contaminants, which can be naturally occurring or the result of oil and gas production and mining activities.

(C) In order to ensure that tap water is safe to drink, the EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Food

and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

(D) Contaminants may be found in drinking water that may cause taste, color, or odor problems. These types of problems are not necessarily causes for health concerns. For more information on taste, odor, or color of drinking water, please contact the system's business office.

(E) Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at (800) 426-4791.

(2) The report must include the telephone number of the owner, operator, or designee of the community water system as an additional source of information concerning the report.

(3) Each English language report must include the following statement in a prominent place on the first page: "Este reporte incluye informacion importante sobre el agua para tomar. Para asistencia en español, favor de llamar al telefono (XXX) XXX-XXXX." In addition to this statement in Spanish, for communities with a large proportion of limited English proficiency residents, as determined by the executive director, the report must contain information in the appropriate language(s) regarding the importance of the report or contain a telephone number or address where such residents may contact the system to obtain a translated copy of the report or assistance in the appropriate language.

(4) The report must include information about opportunities for public participation in decisions that may affect the quality of the water (e.g., time and place of regularly scheduled board meetings). Investor-owned utilities are encouraged to conduct public meetings, but must include a phone number for public input.

(5) The systems may include such additional information for public education consistent with, and not detracting from, the purposes of the report.

(6) Systems that use an interconnect or emergency source to augment the drinking water supply during the calendar year of the report must provide the source of the water, the length of time used, an explanation of why it was used, and whom to call for the water quality information.

(7) Beginning December 1, 2009, any groundwater system that receives notice from a laboratory of a fecal indicator-positive groundwater source sample that is not invalidated by the executive director under §290.109(d) of this title (relating to Microbial Contaminants) must inform its customers of any fecal indicator-positive groundwater source sample in the next report. The system must continue to inform the public annually until the executive director determines that the fecal contamination in the groundwater source is addressed under §290.116(a) of this title (relating to Groundwater Corrective Actions and Treatment Techniques). Each report must include the following elements:

(A) the source of the fecal contamination (if the source is known) and the dates of the fecal indicator-positive groundwater source samples;

(B) actions taken to address the fecal contamination in the groundwater source as directed by §290.116 of this title and the date of such action;

(C) for each fecal contamination in the groundwater source that has not been addressed under §290.116 of this title, the plan approved by the executive director and schedule for correction, including interim measures, progress to date, and any interim measures completed; and

(D) for a fecal indicator-positive groundwater source sample that is not invalidated by the executive director under §290.109(d) of this title, the potential health effects using the health effects language of §290.275(3) of this title.

(8) Beginning December 1, 2009, any groundwater system that receives notice from the executive director of a significant deficiency must inform its customers of any significant deficiency that is uncorrected at the time of the next report. The system must continue to inform the public annually until the executive director determines that particular significant deficiency is corrected under §290.116 of this title. Each report must include the following elements:

(A) the nature of the particular significant deficiency and the date the significant deficiency was identified by the executive director;

(B) for each significant deficiency, the plan approved by the executive director and schedule for correction, including interim measures, progress to date, and any interim measures completed; and

(C) if corrected before the next report, the nature of the significant deficiency, how the deficiency was corrected, and the date of the corrections.

§290.273. Required Additional Health Information.

(a) All reports must prominently display the following language on the first page of the consumer confidence report or in bold print on the second page of the report: "You may be more vulnerable than the general population to certain microbial contaminants, such as *Cryptosporidium*, in drinking water. Infants, some elderly, or immunocompromised persons such as those undergoing chemotherapy for cancer; those who have undergone organ transplants; those who are undergoing treatment with steroids; and people with HIV/AIDS or other immune system disorders can be particularly at risk from infections. You should seek advice about drinking water from your physician or health care provider. Additional guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* are available from the Safe Drinking Water Hotline at (800) 426-4791."

(b) A system that detects arsenic levels above 5 micrograms per liter but below the maximum contaminant level (MCL) shall include in its report a short informational statement about arsenic using the following language: “While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.”

(c) A system that detects nitrate at levels above 5 mg/L, but below the MCL shall include a short informational statement about the impacts of nitrate on children using the following language: "Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you should ask advice from your health care provider."

(d) Systems collecting 20 or more samples that detect lead above the action level in greater than 5.0% of homes sampled shall include a short informational statement about the special impact of lead on children using the following language: "Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at the homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to two minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline at (800) 426-4791."

(e) Any water system subject to any or all of subsections (b) - (d) of this section may seek approval from the executive director to write its own alternative educational informational statement.

(f) Public water systems that detect total trihalomethanes above 0.080 mg/L as a running annual average shall include health effects language provided in §290.275(3) of this title (relating to Appendices A - D), Appendix C, paragraph (81).

§290.275. Appendices A - D.

The following appendices are integral components of the subchapter.

(1) Appendix A--Converting MCL Compliance Values for Consumer Confidence Reports.

Figure: 30 TAC §290.275(1)

Appendix A--Converting Maximum Contaminant Level Compliance Values for Consumer Confidence Reports

Key

AL =	Action Level
MCL =	Maximum Contaminant Level
MCLG =	Maximum Contaminant Level Goal
MFL =	million fibers per liter
mrem/year =	millirems per year (a measure of radiation absorbed by the body)
NTU =	Nephelometric Turbidity Units
pCi/L =	picocuries per liter (a measure of radioactivity)
ppm =	parts per million, or milligrams per liter (mg/L)
ppb =	parts per billion, or micrograms per liter (µg/L)
ppt =	parts per trillion, or nanograms per liter
ppq =	parts per quadrillion, or picograms per liter
TT =	Treatment Technique

Contaminant	MCL in compliance units (mg/L)	multiply by . . .	MCL in CCR units	MCLG in CCR units
Microbiological Contaminants				
1. Total Coliform Bacteria			For systems that collect 40 or more samples per month - Presence of coliform bacteria in more than 5% of monthly samples. For systems that collect fewer than 40 samples per month - Presence of coliform bacteria in more than 1 sample per month.	0
2. Fecal coliform and E. coli			A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or E. coli positive.	0
3. Fecal indicators (enterococci or coliphage)			TT	n/a
4. Total organic carbon			TT (ppm)	n/a
5. Turbidity			TT (NTU)	n/a
Radioactive Contaminants				
6. Beta/photon emitters	4 mrem/yr		4 mrem/yr	0
7. Alpha emitters	15 pCi/L		15 pCi/L	0
8. Combined radium	5 pCi/L		5 pCi/L	0
9. Uranium	30 µg/L		30 µg/L	0

Inorganic Contaminants				
10. Antimony	.006	1000	6 ppb	6
11. Arsenic	010	1000	10 ppb	n/a
12. Asbestos	7 MFL		7 MFL	7
13. Barium	2		2 ppm	2
14. Beryllium	.004	1000	4 ppb	4
15. Bromate	.010	1000	10 ppb	0
16. Cadmium	.005	1000	5 ppb	5
17. Chloramines	MRDL=4		MRDL=4 ppm	4
18. Chlorine	MRDL=4		MRDL=4 ppm	4
19. Chlorine Dioxide	MRDL=.8	1000	MRDL=800 ppb	800
20. Chlorite	1.0		1 ppm	0.8
21. Chromium	.1	1000	100 ppb	100
22. Copper	AL=1.3		AL=1.3 ppm	1.3
23. Cyanide	.2	1000	200 ppb	200
24. Fluoride	4		4 ppm	4
25. Lead	AL=.015	1000	AL=15 ppb	0
26. Mercury (inorganic)	.002	1000	2 ppb	2
27. Nitrate (as Nitrogen)	10		10 ppm	10
28. Nitrite (as Nitrogen)	1		1 ppm	1
29. Selenium	.05	1000	50 ppb	50

30. Thallium	.002	1000	2 ppb	0.5
Synthetic Organic Contaminants including Pesticides and Herbicides				
31. 2,4-D	.07	1000	70 ppb	70
32. 2,4,5-TP (Silvex)	.05	1000	50 ppb	50
33. Acrylamide			TT	0
34. Alachlor	.002	1000	2 ppb	0
35. Atrazine	.003	1000	3 ppb	3
36. Benzo(a)pyrene (PAH)	.0002	1,000,000	200 ppt	0
37. Carbofuran	.04	1000	40 ppb	40
38. Chlordane	.002	1000	2 ppb	0
39. Dalapon	.2	1000	200 ppb	200
40. Di(2-ethylhexyl)adipate	.4	1000	400 ppb	400
41. Di(2-ethylhexyl) phthalate	.006	1000	6 ppb	0
42. Dibromochloropropane	.0002	1,000,000	200 ppt	0
43. Dinoseb	.007	1000	7 ppb	7
44. Diquat	.02	1000	20 ppb	20
45. Dioxin (2,3,7,8-TCDD)	.00000003	1,000,000,000	30 ppq	0
46. Endothall	.1	1000	100 ppb	100
47. Endrin	.002	1000	2 ppb	2
48. Epichlorohydrin			TT	0
49. Ethylene	.00005	1,000,000	50 ppt	0

dibromide				
50. Glyphosate	.7	1000	700 ppb	700
51. Heptachlor	.0004	1,000,000	400 ppt	0
52. Heptachlor epoxide	.0002	1,000,000	200 ppt	0
53. Hexachlorobenzene	.001	1000	1 ppb	0
54. Hexachloro-cyclopentadiene	.05	1000	50 ppb	50
55. Lindane	.0002	1,000,000	200 ppt	200
56. Methoxychlor	.04	1000	40 ppb	40
57. Oxamyl (Vydate)	.2	1000	200 ppb	200
58. PCBs (Polychlorinated biphenyls)	.0005	1,000,000	500 ppt	0
59. Pentachlorophenol	.001	1000	1 ppb	0
60. Picloram	.5	1000	500 ppb	500
61. Simazine	.004	1000	4 ppb	4
62. Toxaphene	.003	1000	3 ppb	0
Volatile Organic Contaminants				
63. Benzene	.005	1000	5 ppb	0
64. Carbon tetrachloride	.005	1000	5 ppb	0
65. Chlorobenzene	.1	1000	100 ppb	100
66. o-Dichlorobenzene	.6	1000	600 ppb	600
67. p-Dichlorobenzene	.075	1000	75 ppb	75
68. 1,2-Dichloroethane	.005	1000	5 ppb	0

69. 1,1-Dichloroethylene	.007	1000	7 ppb	7
70. cis-1,2-Dichloroethylene	.07	1000	70 ppb	70
71. trans-1,2-Dichloroethylene	.1	1000	100 ppb	100
72. Dichloromethane	.005	1000	5 ppb	0
73. 1,2-Dichloropropane	.005	1000	5 ppb	0
74. Ethylbenzene	.7	1000	700 ppb	700
75. Haloacetic acids	0.060	1000	60 ppb	n/a
76. Styrene	.1	1000	100 ppb	100
77. Tetrachloroethylene	.005	1000	5 ppb	0
78. 1,2,4-Trichlorobenzene	.07	1000	70 ppb	70
79. 1,1,1-Trichloroethane	.2	1000	200 ppb	200
80. 1,1,2-Trichloroethane	.005	1000	5 ppb	3
81. Trichloroethylene	.005	1000	5 ppb	0
82. TTHMs (Total trihalomethanes)	.10	1000	100 ppb	n/a
83. Toluene	1		1 ppm	1
84. Vinyl Chloride	.002	1000	2 ppb	0
85. Xylenes	10		10 ppm	10

(2) Appendix B--Sources of Regulated Contaminants.

Figure: 30 TAC §290.275(2)

Appendix B--Sources of Regulated Contaminants

Key

AL =	Action Level
MCL =	Maximum Contaminant Level
MCLG =	Maximum Contaminant Level Goal
MFL =	million fibers per liter
mrem/year =	millirems per year (a measure of radiation absorbed by the body)
NTU =	Nephelometric Turbidity Units
pCi/L =	picocuries per liter (a measure of radioactivity)
ppm =	parts per million, or milligrams per liter (mg/L)
ppb =	parts per billion, or micrograms per liter (µg/L)
ppt =	parts per trillion, or nanograms per liter
ppq =	parts per quadrillion, or picograms per liter
TT =	Treatment Technique

Contaminant (units)	MCLG	MCL	Major sources in drinking water
Microbiological Contaminants			
1. Total Coliform Bacteria	0	For systems that collect 40 or more samples per month - Presence of coliform bacteria in more than 5% of monthly	Naturally present in the environment.

		samples. For systems that collect fewer than 40 samples per month - Presence of coliform bacteria in more than 1 sample per month.	
2. Fecal coliform and E. coli	0	A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or E. coli positive.	Human and animal fecal waste.
3. Fecal indicators (enterococci or coliphage)	n/a	TT	Human and animal fecal waste.
4. Total organic carbon (ppm)	n/a	TT	Naturally present in the environment.
5. Turbidity	n/a	TT	Soil runoff.
Radioactive Contaminants			
6. Beta/photon emitters (mrem/yr)	0	4	Decay of natural and man-made deposits.
7. Alpha emitters (pCi/L)	0	15	Erosion of natural deposits.
8. Combined radium (µg/L)	0	5	Erosion of natural deposits.
Inorganic Contaminants			
9. Uranium (µg/L)	0	30	Erosion of natural deposits.
10. Antimony (ppb)	6	6	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder.
11. Arsenic (ppb)	n/a	10	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.
12. Asbestos (MFL)	7	7	Decay of asbestos cement water

			mains; Erosion of natural deposits.
13. Barium (ppm)	2	2	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
14. Beryllium (ppb)	4	4	Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries.
15. Bromate (ppb)	0	10	By-product of drinking water disinfection.
16. Cadmium (ppb)	5	5	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; runoff from waste batteries and paints.
17. Chloramines (ppm)	MRDLG=4	MRDL=4	Water additive used to control microbes.
18. Chlorine (ppm)	MRDLG=4	MRDL=4	Water additive used to control microbes.
19. Chlorine Dioxide (ppb)	800	800	Water additive used to control microbes.
20. Chlorite (ppm)	1.0	1.0	By-product of drinking water disinfection.
21. Chromium (ppb)	100	100	Discharge from steel and pulp mills; Erosion of natural deposits.
22. Copper (ppm)	1.3	AL=1.3	Corrosion of household plumbing systems; Erosion of natural deposits.
23. Cyanide (ppb)	200	200	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories.
24. Fluoride (ppm)	4	4	Erosion of natural deposits; Water additive which promotes strong

			teeth; Discharge from fertilizer and aluminum factories.
25. Lead (ppb)	0	AL=15	Corrosion of household plumbing systems; Erosion of natural deposits.
26. Mercury (inorganic) (ppb)	2	2	Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland.
27. Nitrate (as Nitrogen) (ppm)	10	10	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
28. Nitrite (as Nitrogen) (ppm)	1	1	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
29. Selenium (ppb)	50	50	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines.
30. Thallium (ppb)	0.5	2	Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories.
Synthetic Organic Contaminants including Pesticides and Herbicides			
31. 2,4-D (ppb)	70	70	Runoff from herbicide used on row crops.
32. 2,4,5-TP (Silvex) (ppb)	50	50	Residue of banned herbicide.
33. Acrylamide	0	TT	Added to water during sewage/wastewater treatment.
34. Alachlor (ppb)	0	2	Runoff from herbicide used on row crops.
35. Atrazine (ppb)	3	3	Runoff from herbicide used on row crops.

36. Benzo(a)pyrene (PAH) (nanograms/L)	0	200	Leaching from linings of water storage tanks and distribution lines.
37. Carbofuran (ppb)	40	40	Leaching of soil fumigant used on rice and alfalfa.
38. Chlordane (ppb)	0	2	Residue of banned termiticide.
39. Dalapon (ppb)	200	200	Runoff from herbicide used on rights of way.
40. Di(2-ethylhexyl) adipate (ppb)	400	400	Discharge from chemical factories.
41. Di(2-ethylhexyl) phthalate (ppb)	0	6	Discharge from rubber and chemical factories.
42. Dibromochloropropane (ppt)	0	200	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards.
43. Dinoseb (ppb)	7	7	Runoff from herbicide used on soybeans and vegetables.
44. Diquat (ppb)	20	20	Runoff from herbicide use.
45. Dioxin (2,3,7,8-TCDD) (ppq)	0	30	Emissions from waste incineration and other combustion; Discharge from chemical factories.
46. Endothall (ppb)	100	100	Runoff from herbicide use.
47. Endrin (ppb)	2	2	Residue of banned insecticide.
48. Epichlorohydrin	0	TT	Discharge from industrial chemical factories; An impurity of some water treatment chemicals.
49. Ethylene dibromide (ppt)	0	50	Discharge from petroleum refineries.
50. Glyphosate (ppb)	700	700	Runoff from herbicide use.
51. Heptachlor (ppt)	0	400	Residue of banned termiticide.

52. Heptachlor epoxide (ppt)	0	200	Breakdown of heptachlor.
53. Hexachlorobenzene (ppb)	0	1	Discharge from metal refineries and agricultural chemical factories.
54. Hexachlorocyclopentadiene (ppb)	50	50	Discharge from chemical factories.
55. Lindane (ppt)	200	200	Runoff/leaching from insecticide used on cattle, lumber, gardens.
56. Methoxychlor (ppb)	40	40	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock.
57. Oxamyl (Vydate) (ppb)	200	200	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes.
58. PCBs (Polychlorinated biphenyls) (ppt)	0	500	Runoff from landfills; Discharge of waste chemicals.
59. Pentachlorophenol (ppb)	0	1	Discharge from wood preserving factories.
60. Picloram (ppb)	500	500	Herbicide runoff.
61. Simazine (ppb)	4	4	Herbicide runoff.
62. Toxaphene (ppb)	0	3	Runoff/leaching from insecticide used on cotton and cattle.
Volatile Organic Compounds			
63. Benzene (ppb)	0	5	Discharge from factories; Leaching from gas storage tanks and landfills.
64. Carbon tetrachloride (ppb)	0	5	Discharge from chemical plants and other industrial activities.

65. Chlorobenzene (ppb)	100	100	Discharge from chemical and agricultural chemical factories.
66. o-Dichlorobenzene (ppb)	600	600	Discharge from industrial chemical factories.
67. p-Dichlorobenzene (ppb)	75	75	Discharge from industrial chemical factories.
68. 1,2-Dichloroethane (ppb)	0	5	Discharge from industrial chemical factories.
69. 1,1-Dichloroethylene (ppb)	7	7	Discharge from industrial chemical factories.
70. cis-1,2-Dichloroethylene (ppb)	70	70	Discharge from industrial chemical factories.
71. trans-1,2-Dichloroethylene (ppb)	100	100	Discharge from industrial chemical factories.
72. Dichloromethane (ppb)	0	5	Discharge from pharmaceutical and chemical factories.
73. 1,2-Dichloropropane (ppb)	0	5	Discharge from industrial chemical factories.
74. Ethylbenzene (ppb)	700	700	Discharge from petroleum refineries.
75. Haloacetic acids (HAA) (ppb)	n/a	60	By-product of drinking water disinfection.
76. Styrene (ppb)	100	100	Discharge from rubber and plastic factories; Leaching from landfills.
77. Tetrachloroethylene (ppb)	0	5	Leaching from PVC pipes; Discharge from factories and dry cleaners.
78. 1,2,4-Trichlorobenzene (ppb)	70	70	Discharge from textile-finishing factories.
79. 1,1,1-Trichloroethane (ppb)	200	200	Discharge from metal degreasing sites and other factories.

80. 1,1,2-Trichloroethane (ppb)	3	5	Discharge from industrial chemical factories.
81. Trichloroethylene (ppb)	0	5	Discharge from metal degreasing sites and other factories.
82. TTHMs (Total trihalomethanes) (ppb)	n/a	80	By-product of drinking water disinfection.
83. Toluene (ppm)	1	1	Discharge from petroleum factories.
84. Vinyl Chloride (ppb)	0	2	Leaching from PVC piping; Discharge from plastics factories.
85. Xylenes (ppm)	10	10	Discharge from petroleum factories; Discharge from chemical factories.

(3) Appendix C—Health Effects Language.

Figure: 30 TAC §290.275(3)

Appendix C--Health Effects Language

Microbiological Contaminants

(1) Total coliform. Coliforms are bacteria that are naturally present in the environment 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.

(2) Fecal coliform/ E. coli. 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, and people with severely compromised immune systems.

(3) Fecal indicators (enterococci or coliphage). 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.

(4) Total organic carbon. Total organic carbon (TOC) has no health affects. However, TOC provides a medium for the formation of disinfection by-products. These by-products include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these by-products in excess of the maximum contaminant level (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.

(5) Turbidity. 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.

Radioactive Contaminants

(6) Beta/photon emitters. 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.

(7) Alpha emitters. 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.

(8) Combined Radium 226/228. 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.

(9) Uranium. 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.

Inorganic Contaminants

(10) Antimony. 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.

(11) Arsenic. 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.

(12) Asbestos. 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.

(13) Barium. Some people who drink water containing barium in excess of the MCL over many years

could experience an increase in their blood pressure.

(14) Beryllium. Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.

(15) Bromate. Some people who drink water containing bromate in excess of the MCL over many years could experience an increased risk of getting cancer.

(16) Cadmium. Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.

(17) Chloramines. 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 maximum residual disinfectant level (MRDL) could experience stomach discomfort or anemia.

(18) Chlorine. 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.

(19) Chlorine dioxide. 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.

(20) Chlorite. 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.

(21) Chromium. Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.

(22) Copper. 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.

(23) Cyanide. 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.

(24) Fluoride. 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. Children may get mottled teeth.

(25) Lead. 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.

(26) Mercury (inorganic). Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.

(27) Nitrate. 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.

(28) Nitrite. 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.

(29) Selenium. 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.

(30) Thallium. 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

(31) 2,4-D. 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.

(32) 2,4,5-TP (Silvex). Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.

(33) Acrylamide. 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.

(34) Alachlor. 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.

(35) Atrazine. 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.

(36) Benzo(a)pyrene (PAH). 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.

(37) Carbofuran. 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.

(38) Chlordane. 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.

(39) Dalapon. Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.

(40) Di (2-ethylhexyl) adipate. Some people who drink water containing di (2-ethylhexyl) adipate well in excess of the MCL over many years could experience general toxic effects such as weight loss, liver enlargement, or possible reproductive difficulties.

(41) Di (2-ethylhexyl) phthalate. Some people who drink water containing di (2-ethylhexyl) phthalate 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.

(42) Dibromochloropropane (DBCP). Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.

(43) Dinoseb. Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.

(44) Dioxin (2,3,7,8-TCDD). 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.

(45) Diquat. Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.

(46) Endothall. Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.

(47) Endrin. Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.

(48) Epichlorohydrin. 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.

(49) Ethylene dibromide. 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.

(50) Glyphosate. Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.

(51) Heptachlor. 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.

(52) Heptachlor epoxide. 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.

(53) Hexachlorobenzene. 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.

(54) Hexachlorocyclopentadiene. Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.

(55) Lindane. Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.

(56) Methoxychlor. Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.

(57) Oxamyl. Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.

(58) PCBs. 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.

(59) Pentachlorophenol. 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.

(60) Picloram. Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.

(61) Simazine. Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.

(62) Toxaphene. 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.

Volatile Organic Contaminants

(63) Benzene. 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.

(64) Carbon Tetrachloride. 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.

(65) Chlorobenzene. Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.

(66) o-Dichlorobenzene. 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.

(67) p-Dichlorobenzene. 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.

(68) 1,2-Dichloroethane. 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.

(69) 1,1-Dichloroethylene. Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.

(70) cis-1,2-Dichloroethylene. Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.

(71) trans-1,2-Dicholoroethylene. 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.

(72) Dichloromethane. 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.

(73) 1,2-Dichloropropane. 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.

(74) Ethylbenzene. Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.

(75) Haloacetic acids (HAAs). Some people who drink water containing HAAs in excess of the MCL over many years may have an increased risk of getting cancer.

(76) Styrene. 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.

(77) Tetrachloroethylene. 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.

(78) 1,2,4-Trichlorobenzene. 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.

(79) 1,1,1,-Trichloroethane. 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.

(80) 1,1,2-Trichloroethane. 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.

(81) Trichloroethylene. 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.

(82) TTHMs (Total Trihalomethanes). 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.

(83) Toluene. 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.

(84) Vinyl Chloride. Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.

(85) Xylenes. Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.

(4) Appendix D--Unregulated Contaminants.

Figure: 30 TAC 290.275(4)

(1) Chloroform
(2) Bromodichloromethane
(3) Chlorodibromomethane
(4) Bromoform
(5) Dibromomethane
(6) m-Dichlorobenzene
(7) [Reserved]
(8) 1,1-Dichloropropene
(9) 1,1-Dichloroethane
(10) 1,1,2,2-Tetrachloroethane
(11) 1,3-Dichloropropane
(12) Chloromethane
(13) Bromomethane
(14) 1,2,3-Trichloropropane
(15) 1,1,1,2-Tetrachloroethane
(16) Chloroethane
(17) 2,2-Dichloropropane
(18) o-Chlorotoluene
(19) p-Chlorotoluene
(20) Bromobenzene
(21) 1,3-Dichloropropene