

The Texas Natural Resource Conservation Commission (TNRCC or commission) adopts amendments to §290.38, Definitions; §290.39, General Provisions; §290.41, Water Sources; §290.44, Water Distribution; §290.45, Minimum Water System Capacity Requirements; and §290.47, Appendices.

The commission also adopts new §290.42, Water Treatment; §290.46, Minimum Acceptable Operating Practices for Public Drinking Water Systems; §290.101, Purpose; §290.102, General Applicability; §290.103, Definitions; §290.104, Summary of Maximum Contaminant Levels, Maximum Residual Disinfectant Levels, Treatment Techniques, and Action Levels, §290.105, Secondary Standards; §290.106, Inorganic Contaminants; §290.107, Organic Contaminants; §290.108, Radiological Sampling and Analytical Requirements; §290.109, Microbial Contaminants; §290.110, Disinfectant Residuals; §290.111, Turbidity; §290.112, Total Organic Carbon (TOC); §290.113, Disinfection By-products (TTHM AND HAA5); §290.114, Disinfection By-products Other than TTHM and HAA5; §290.115, Transition Rule for Disinfection By-products; §290.117, Regulation of Lead and Copper; §290.118, Secondary Constituents; §290.119, Analytical Procedures; §290.121, Monitoring Plans; and §290.122, Public Notification. The commission also adopts the repeal of §290.42, Water Treatment; §290.46, Minimum Acceptable Operating Practices for Public Drinking Water Systems; and §§290.101-290.106 and 290.108 - 290.121. Sections 290.39, 290.41, 290.42, 290.44, 290.46, 290.47, 290.102 - 290.115, 290.118, 290.119, and 290.121 are adopted *with changes* to the proposed text as published in the April 21, 2000, issue of the *Texas Register* (25 TexReg 3420). The amendments to §290.38 and §290.45; the repeal of §§290.42, 290.46, 290.101 - 290.106, and 290.108 - 290.121; and new §§290.101, 290.117, 290.122 are adopted *without changes* and will not be republished.

BACKGROUND AND SUMMARY OF THE FACTUAL BASIS FOR THE ADOPTED RULES

The adopted rules implement the federal Stage 1 Disinfectants and Disinfection By-products Rule (DBP1R), 63 Fed Reg 69390 (1998) and the federal Interim Enhanced Surface Water Treatment Rule (IESWTR), 63 Fed Reg 69478 (1998). The adopted rules will also make changes to the state design criteria for drinking water treatment plants and clarify existing regulatory requirements.

The sections of the rules relating to the federal Stage 1 DBP1R implement National Primary Drinking Water Regulations for three disinfectants (chlorine, chloramines, and chlorine dioxide), two groups of organic disinfection by-products (total trihalomethanes and haloacetic acids) and their organic precursors, and two inorganic disinfection by-products (chlorite and bromate). These sections also include monitoring, reporting, and public notification requirements for these compounds. The sections that relate to the disinfectants apply to all public water systems while the sections related to organic and inorganic disinfection byproducts apply only to community water systems and nontransient, noncommunity systems. The regulatory provisions related to the federal Stage 1 DBP1R are implemented in a staged manner beginning January 1, 2001.

The sections of the rules related to the federal IESWTR apply to all public water systems operating surface water treatment plants or treatment plants for groundwater under the direct influence of surface water (GUI). A well is under the direct influence of surface water if water from the surface can flow into the well. For example, the presence of surface-water dwelling microbes in the wellwater would indicate that the well is under the direct influence of surface water. The rules require *Cryptosporidium* removal at all surface water and GUI systems through strengthened combined filter effluent turbidity (CFE) performance standards. The rules also establish individual filter turbidity provisions and

disinfection benchmark provisions for those surface water and GUI systems serving more than 10,000 people. All of the sections related to the IESWTR become effective on January 1, 2002.

The federal requirements for IESWTR apply to public water systems that serve at least 10,000 people and use surface water or GUI. Systems that serve fewer than 10,000 people and use surface water or GUI will be regulated under the United States Environmental Protection Agency's (EPA) proposed Long Term Stage 1 Enhanced Surface Water Treatment Rule (LT1ESWTR). The *Cryptosporidium* removal (i.e., combined filter effluent) provisions of the LT1ESWTR will be the same as the IESWTR provisions. Although the proposed effective date of the LT1ESWTR is November 1, 2003, Texas rules implement the CFE turbidity limits for systems serving fewer than 10,000 people at the same time as systems serving 10,000 or more people on January 1, 2002.

The draft proposal language for the Chapter 290 rules was developed in an ad hoc workgroup that included representatives of utilities of all types and sizes, from all areas of Texas; Texas League of Women Voters; Texas Rural Water Association; Texas Water Utilities Association; Texas Section of the American Water Works Association; Clean Water Action; Texas Municipal League; Texas AIDS Network; TNRCC Field Operations staff; and TNRCC central office staff. Each element of the rules was covered in four eight-hour meetings. One of the items this group discussed was the well-documented public health threat posed by even short-term exposure to *Cryptosporidium*. Because lowering the turbidity of the combined filter effluent provides a significant degree of protection against this pathogen, the group reached a consensus that the new strengthened CFE turbidity limits should be implemented simultaneously for small and large surface water and GUI systems. However, the workgroup recognized that some small systems might not be able to meet the new CFE turbidity limit

with their existing facilities and recommended that the commission extend the compliance deadline for small surface water and GUI treatment plants that need to upgrade or renovate their facilities. Under the adopted rules, the TNRCC will extend the compliance deadline for the new CFE limit until January 1, 2004, (i.e., the date that DBP1R provisions apply to systems which serve fewer than 10,000 people) for any small system that needs to make, and agrees to make necessary capital improvements to its surface water or GUI treatment plant.

Chapter 290 also includes revised design criteria for public water system facilities and revises monitoring and reporting requirements. The sections of the rules relating to state design criteria apply to all public water systems. However, some of the changes to the design criteria apply to specific unit processes and therefore will only affect water treatment plants utilizing those specific unit processes. If a plant does not have a specific unit process that is covered by the rules, the plant is not affected by the rules regarding that specific unit process.

SECTION BY SECTION DISCUSSION

Adopted new §290.38, Definitions, incorporates definitions that are used in the subchapter. These include a definition of public drinking water program which is a term used in various sections of the adopted regulations. Because of changes to various rules related to backflow protection and cross-connection control, the definitions for ABPA, ASSE, and high health hazard were deleted. The definition of health hazard is amended, and definitions for air gap, nonhealth hazard, potential contamination hazard, and L/d ratio are added.

Adopted new §290.39, General Provisions, incorporates three new provisions. This section provides that a person proposing to install a public drinking water system near a city, district, or a certificated service area of another water service provider must file a written application for service with that other service provider and pay all application fees. This section also allows a public water system to seek a hardship exception to the requirement to apply for service. Finally, the section requires all systems to notify the executive director of any plans to modify its disinfection practices.

Adopted new §290.39(c)(2) provides a hardship exception for the requirement to apply for service from an adjacent water supply. The executive director will evaluate any request for this hardship exception using criteria found in the agency's regulatory guidance document, "The Feasibility of Regionalization, Water Utilities Program."

Adopted new §290.39(e)(5) provides that construction features and facility siting for new water systems and major improvements must be in conformity with applicable commission rules.

Adopted new §290.39(j)(2) provides that certain public water systems (i.e., those that use surface water sources or groundwater sources under the direct influence of surface water) must notify the executive director prior to making significant changes to the disinfection process used at their treatment plant and was amended to require these systems to obtain the executive director's approval before implementing the change.

Adopted new §290.39(j)(3) provides that public water systems must notify the executive director prior to changing the type of disinfectant used to maintain a disinfectant residual in the distribution system.

Adopted new §290.41, Water Sources, references the current American Water Works Association (AWWA) standard for water well pressure cementation methods. This section also provides that water quality data that must be provided by the design engineer to the staff in order to obtain approval for a new surface water source.

Adopted new §290.41(c)(3)(C) references the current AWWA standard for water well pressure cementation methods.

Adopted new §290.41(c)(3)(H) provides that well installation must be done in such a way that the public water supply well is protected from contamination due to flooding.

Adopted new §290.41(e)(1)(F) expressly states the water quality data that must be provided by the design engineer to the executive director in order to obtain approval for a new surface water source. This section was amended to add source water pH to the list of parameters. Also, in response to comments, fecal coliform was replaced by *Escherichia coli* to better correspond with the state water quality standards for identification of human contamination.

Adopted new §290.42 contains the state design criteria for drinking water treatment plants.

Adopted new §290.42(a) provides for the capacity of the public water system's production and treatment facilities. New subsection (b) provides the standards for groundwater sources.

Adopted new §290.42(c) addresses standards for springs and other water sources. New paragraph (1) incorporates the new federal requirement, under 40 Code of Federal Regulations (CFR) §141.170(a)(1), that treatment facilities achieve a 2-log (99%) removal of *Cryptosporidium* oocysts from water sources that may be vulnerable to contamination from surface water.

Adopted new §290.42(d) addresses standards for surface water sources and incorporates the new federal requirement that treatment facilities achieve a 2-log (99%) removal of *Cryptosporidium* oocysts from surface water sources from 40 CFR §141.170(a)(1). The section contains the updated minimum design requirements for surface water treatment plants. New paragraph (2) relates to cross-connection control within the treatment plant and was amended to incorporate the prohibition against leaking conduits and piping. New paragraph (3) relates to waste stream management and recycling practices at surface water treatment plants and was amended to eliminate an unrelated sentence regarding leaking piping. New paragraph (5) requires surface water treatment plants to have flow metering devices to monitor the flow rate of water in separate treatment trains, recycled decant water, and treated water used to backwash filters, in addition to the requirement that flow metering devices be provided for raw and finished water. This will provide the water plant operator with basic operational data with which to operate the plant effectively given the new turbidity requirements of 40 CFR §141.173(a)(1).

Adopted new §290.42(d)(6), contains the requirements for chemical storage and feed at surface water treatment plants. New subparagraph (A) requires that the system be designed with the capability to store a 15-day supply of chemicals at the design capacity of the surface water treatment plant. This addresses the fact that resupply in Texas may be accomplished with more rapidity than that which was achievable at the time the old rule was promulgated. New subparagraph (B) contains the requirements

for day tanks and provides for process control instrumentation to ensure that no overfeed of chemicals occurs. New subparagraph (C) requires that all chemical tanks be clearly labeled with the tank's contents and new subparagraph (D) contains the requirements for storage of dry chemicals. New subparagraph (E) requires bulk storage facilities, day tanks, and their containment facilities be designed to minimize the possibility of leaks and spills. New subparagraph (F) requires that the pumps and control systems used in contact with a chemical be designed to minimize the possibility of leaks and spills. New subparagraph (G) requires the piping and valves associated with the storage of a chemical be constructed of materials compatible with that chemical.

Adopted new §290.42(d)(7), relates to the design of facilities used to feed water treatment chemicals. The paragraph contains requirements that will allow chemicals to be applied in a manner that will maximize reliability, facilitate maintenance, and ensure optimal finished water quality. Subparagraph (A) requires each chemical feeder to have a standby or reserve unit. Subparagraph (B) addresses chemical feed equipment dosage. Subparagraph (C) requires the materials used for chemical feeders be compatible with the chemical being fed and subparagraph (D) requires that the design of chemical feed systems prevent chemical back-siphoning. Subparagraph (E) addresses enclosed feed lines, subparagraph (F) addresses dry chemical feeders, subparagraph (G) addresses coagulant feed systems, subparagraph (H) addresses the separation of chlorine and ammonia feed equipment, and subparagraph (I) requires chemical feed points be provided to achieve acceptable finished water quality, adequate taste and odor control, corrosion control, and disinfection.

Adopted new §290.42(d)(8) addresses flash mixing equipment, distinct from flocculation. Two sets of mechanical flash mixing equipment are required for plants treating more than 3.0 million gallons per

day. Public water systems with other sources of potable water, with which they can meet average daily water demand, are exempted from the requirement for redundant equipment. Flash mixing equipment is to be sized to account for the range of flows likely to be treated at the plant.

Adopted new §290.42(d)(9) contains provisions for flocculation equipment. Subparagraph (A) allows public water systems treating over 3.0 million gallons per day with other sources of potable water, with which they can meet average daily water demand, to design a new plant with one set of flocculation equipment. Subparagraph (B) addresses the design of coagulation to achieve settleable floc.

Flocculation facilities are to be designed with a minimum theoretical detention time of at least 20 minutes when operated at the design flow rate to correspond with currently acceptable engineering practice. However, 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 Units (NTU) and the filtered water meets the requirements of §290.111. Flocculation facilities are to be designed with decreasing mixing energy from the inlet to outlet. Subparagraph (C) requires coagulated water be transported without destruction of floc.

Adopted new §290.42(d)(10) contains the requirements for surface water treatment plant sedimentation or clarification facilities. Subparagraph (A) allows public water systems treating over 3.0 million gallons per day, with other sources of potable water with which they can meet average daily water demand, to design a new plant to have one set of clarification equipment. Subparagraph (B) requires design to prevent short-circuiting and coagulated water flow through the sedimentation basins without destruction of floc. Subparagraph (C) enumerates the specific design parameters needed for adequate sedimentation, including both hydraulic detention time and surface overflow rate as design parameters.

Subparagraph (D) requires clarification basins be designed to prevent the accumulation of settled solids. Sedimentation basins must be designed to be capable of complete draining in six hours, if the system has no other sources of potable water with which to meet average daily demand.

Adopted new §290.42(d)(11) contains provisions related to gravity or pressure type filters. Plants must have filtration facilities. Subparagraph (A) requires that the use of pressure filters be limited to installations with a treatment capacity of less than 0.50 million gallons per day. Subparagraph (B) specifies that surface water treatment plants are to be designed with sufficient filter capacity to assure effective filtration. New clause (i) requires rapid sand filters to be designed based on a maximum filtration rate of 2.0 gallons per minute per square foot (gpm/ft²) but allows declining rate filters to be operated at a flow rate of up to 3.0 gpm/ft² at the beginning of the filter run. New clause (ii) requires high-rate gravity filters to be designed based on a maximum filtration rate of 5.0 gpm/ft² but allows these declining rate filters to be operated at a flow rate of up to 6.5 gpm/ft² at the beginning of the filter run. New clause (iii) requires pressure filters to be designed based on a maximum filtration rate of 2.0 gpm/ft² and new clause (iv) requires that the total design capacity of the filtration facilities be based on the cumulative capacity of the individual filters with the largest filter out of service. New clause (iv) conforms with current industry design practices and ensures an adequate supply of potable water to the system's customers during periods of routine filter maintenance. In response to comments, adopted subparagraph (B) was reorganized and amended to remove the clause allowing a plant to be designed with all filters in service if the system has other sources of potable water with which to meet average daily demand. The change to subparagraph (B) was required to ensure that the remaining filters are not overloaded when one filter is off line for backwashing. Subparagraph (C) incorporates current engineering practice for alternative filter bed designs, to enable systems to meet the provisions of 40

CFR §141.173(a). Filter media purity and filter media grain size must conform to AWWA standards and the depth of filter media shall be 24 inches or greater and provide an L/d ratio of at least 1,000. Typical design criteria for rapid sand and a variety of high-rate filters are provided to assist engineers in designing filters that can meet the new turbidity requirements of 40 CFR §141.173(a). The provisions of adopted subparagraph (D), contain requirements for filter support gravel design, have been incorporated as subparagraph (C)(iv) in the adopted rules. New subparagraph (D) provides for flow rate control at each filter. New subparagraph (E) contains the design requirements for monitoring equipment used in conjunction with filters and incorporates provisions of 40 CFR §141.74(a) relating to individual filter monitoring. New subparagraph (F) contains provisions relating to filter backwashing facilities and contains provisions resulting from 40 CFR §141.175(b). New subparagraph (G) allows the continued operation of a drinking water treatment plant during any special studies performed as part of the requirements of 40 CFR §141.175(b) relating to special monitoring on individual filters.

Adopted new §290.42(d)(12) contains lighting and drainage requirements for pipe galleries. Dark grey was added as a required pipe color for filter backwash waste pipes. Adopted new §290.42(d)(13) contains specifications for plant piping paint color schemes to aid in identification. Subparagraph (A) lists the acceptable color code for piping for plants built or repainted after October 1, 2000. Subparagraph (B) allows deviation from the provisions of subparagraph (A) for plants repainted before October 1, 2000, if those plants provide clear visual distinction between process streams. Subparagraph (C) requires that the process piping color scheme be documented and that the documentation be accessible to plant personnel. Dark grey was added as a required pipe color for filter backwash waste pipes.

Adopted new §290.42(d)(14) requires surface water treatment plants to be designed with sampling taps for raw, settled, filtered, and finished water.

Adopted new §290.42(d)(15) contains requirements for an adequately equipped laboratory to be available locally so that daily microbiological and chemical tests can be conducted. Provisions required under 40 CFR §141.131(c) are included. Subparagraph (A) requires systems serving more than 25,000 people to have a local laboratory certified by the Texas Department of Health (TDH) to conduct daily microbial analysis. Subparagraph (B) provides that systems not having on-site microbial analysis facilities may send samples to a certified lab, as long as this can be accomplished within the requisite time period. Subparagraph (C) requires labs to include equipment for required measurements for pH, temperature, disinfectant residual, alkalinity, turbidity, jar tests for determining the optimum coagulant dose, and any other analyses deemed necessary to monitor specific water quality or treatment processes. Subparagraph (D) incorporates the requirement of 40 CFR §141.131(c) that systems using chlorine dioxide have an amperometric titrator with platinum-platinum electrodes. Subparagraph (E) requires systems with sludge blanket clarifier to have a sludge depth measuring device. Subparagraph (F) requires systems using solids recirculation to be equipped to measure slurry solids concentration. Subparagraph (G) requires that after January 1, 2002, surface water treatment plants have a computer and software for recording performance data, maintaining records, and submitting reports. The staff of the public drinking water program will provide spreadsheet templates to public water systems. The spreadsheet templates will assist the water treatment plant in collecting data, calculating results, and reporting results to the commission.

Adopted new §290.42(e)(1), requires water from surface water sources or groundwater under the direct influence of surface water to be disinfected in a manner consistent with the requirements of §290.110 concerning disinfectants. Paragraph (2) requires that all groundwater must be disinfected prior to distribution and specifies the application point. Paragraph (3) provides standards for disinfection equipment. Paragraph (4) clarifies the placement of safety equipment when chlorine gas is used. Paragraph (5) requires that by January 1, 2001, housing for all gas chlorination equipment and cylinders be in a separate building and meet certain safety standards. Paragraph (5) was amended to clarify that gas chlorination equipment and cylinders of chlorine shall be housed in separate buildings or separate rooms with impervious walls or partitions that separate the chlorine facilities from all mechanical equipment not associated with the chlorination equipment. Paragraph (6) specifies ventilation requirements. Paragraph (7) contains standards for hypochlorination solution containers and pumps. Paragraph (8) contains standards for the use of anhydrous ammonia feed equipment.

Adopted new §290.42(f) addresses other treatment processes. The commission corrected the reference from §290.39(g) to §290.39(l).

Adopted new §290.42(g) contains provisions for sanitary facilities for water works installations.

Adopted new §290.42(h) requires a permit from the agency for discharging wastes from water treatment processes.

Adopted new §290.42(i) requires that all chemicals and any additional or replacement process media must conform to American National Standards Institute/National Sanitation Foundation Standard 60 for direct additives and Standard 61 for indirect additives.

Adopted new §290.42(j) contains safety requirements and references the applicable safety standards of the Occupational Safety and Health Administration and the Texas Hazards Communication Act, Texas Health and Safety Code (THSC), Title 5, Chapter 502. The system is required to comply with the EPA requirements for risk management plans.

Adopted new §290.42(k) requires a thorough plant operations manual be compiled and kept up-to-date.

Adopted new §290.44(h), Backflow, Siphonage, relates to backflow prevention.

Adopted new §290.44(h)(1)(A) relates to the installation of air gaps and backflow prevention assemblies at the service connections and references a specific list of health hazards that public water systems must protect against.

Adopted new §290.44(h)(1)(B) also relates to residential air gaps or backflow prevention. Residences or establishments that have an adequate cross-connection control program in place are not required to have backflow prevention at the meter. New clause (i) contains the requirements for inspection, testing, and establishment of an adequate cross-connection control program. New clause (ii) contains the requirements for reporting and record keeping for an adequate cross-connection control program. New clause (iii) places responsibility for cross-connection control programs on the water purveyor.

Adopted new §290.44(h)(4) relates to backflow prevention assembly testing, and what qualifications testers must have. In response to comments, §290.44(h)(4) was modified to provide further clarification, especially in regard to fireline testing. Specifically, §290.44(h)(4)(A)(ii) now reads “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 Marshall’s office requires that any person performing maintenance on firelines must be employed by an Approved Fireline Contractor.”

Adopted new §290.44(h)(4)(B) relates to gauges used to test backflow prevention devices. Adopted new §290.44(h)(4)(C) relates to the reporting requirements for backflow prevention assembly testing.

Adopted new §290.45, Minimum Water System Capacity Requirements, sets out the requirements for redundancy in service pumps for small community and noncommunity water systems in order to help ensure continuous uninterrupted operation of those systems. Redundancy means the provision of two pumps so that, if the main water pump fails, a second pump is available and may be installed quickly so that customers are not without water for extended periods.

Adopted new §290.45(b)(1)(F)(iii) requires at least two service pumps for all groundwater systems with 100 connections or more and for all groundwater systems with fewer than 100 connections that have ground storage. Adopted new §290.45(d)(2)(B)(iii) requires a pump with a total capacity of 2.0 gallons per minute at systems with a maximum demand less than 15 gallons per minute. Adopted new clause (iv) requires at least two pumps at systems with a maximum demand greater than 15 gallons per minute.

Adopted new §290.46 contains the minimum acceptable operating practices for public drinking water systems.

Adopted new §290.46(a) contains general requirements for a public drinking water system. Adopted new §290.46(b) addresses microbiological analysis submission and requirements. Adopted new subsection (c) requires samples for chemical analysis to be submitted as directed by the agency.

Adopted new §290.46(d) contains requirements for disinfectant residuals and monitoring. It requires systems be operated in such a manner that the disinfectant residuals be acceptable and continuously maintained during the treatment process and throughout the distribution system. New paragraph (1) requires compliance with §290.110 and new paragraph (2) specifies the minimum disinfectant residuals in the finished water storage tank and in the far reaches of the distribution system at all times. Systems using free chlorine must operate the disinfection equipment to achieve a free chlorine residual of 0.2 milligrams per liter (mg/L). Systems using chloramines must operate the disinfection equipment in such manner to achieve a total chlorine residual of 0.5 mg/L.

Adopted new §290.46(e) provides the conditions under which a system must be under the direct supervision of a certified water works operator. New paragraph (1) provides requirements for systems which utilize groundwater or purchased water and provides the grade of certification required for the water works operator. A system using only groundwater or purchased water with 250 or fewer connections must be operated by an operator holding minimum of a Class "D" certificate. A system using only groundwater or purchased water serving more than 250 connections must be operated by an operator holding minimum of a Class "C" certificate. A system using only groundwater or purchased

water serving more than 1,000 connections must be operated by two operators holding minimum of a Class "C" certificate. A system using surface water must employ an operator holding minimum of a Class "B" surface water certificate after January 1, 2004, to correspond with proposed changes in operator certification requirements. Until January 1, 2004, a system using surface water must employ an operator holding minimum of a Class "B" surface water certificate or a Class "C" surface water certificate and having completed a 20-hour lab class.

Adopted new §290.46(e)(2) requires that a surface water treatment plant must have at least a Class "C" surface water operator on the premises at any time the plant is in operation or the plant must be equipped with continuous turbidity and disinfectant residual monitors with automatic shutdowns and alarms.

Adopted new §290.46(e)(3) requires systems which are classified as groundwater under the direct influence of surface water to be under the supervision of either an operator who has at least a Class "C" groundwater certificate and has had additional training or who has at least a Class "C" surface water certificate. Systems that utilize cartridge filters must be under the supervision of at least a Class "C" groundwater operator who has completed an eight-hour training course on monitoring and reporting requirements. Systems that utilize coagulant addition and direct filtration must be under the supervision of at least a Class "C" groundwater operator who has completed a 20-hour Surface Water Protection course and an eight-hour training course on monitoring and reporting requirements. Systems which utilize complete surface water treatment must comply with the requirements of §290.46(e)(2).

Adopted new §290.46(e)(4) requires certified operators to provide written notice of the public water systems which they operate to the agency when applying for, renewing, or upgrading their certification or within ten days of any change in responsibility. Adopted new §290.46(e)(5) provides that the training programs for all chemicals used in the water treatment must meet applicable standards established by OSHA or the Texas Hazard Communications Act, THSC, Title 5, Chapter 502.

Adopted new §290.46(f) contains all the requirements for public water systems relating to reporting and record keeping. Paragraph (1) discusses the organization of records and maintenance of copies and allows the records to be maintained in stored in either a hard-copy or electronic formats. Paragraph (2) provides that the operating records be accessible for review during inspections.

Adopted new §290.46(f)(3) specifies the retention schedule for record keeping. In response to comments, this section was modified to clarify that all public water systems must keep records of operations. New subparagraph (A) requires that for at least two years records must be retained for the amount of chemical used daily; volume of water treated each day; complaints with respect to water quality, low pressure, or outages and results of investigations; dates that dead-end mains were flushed; dates that storage tanks and other facilities were cleaned; and maintenance records for water system equipment and facilities. Adopted new subparagraph (B) requires three-year retention for records of violation and corrective action, records of all public notices issued by the system, records of special filter monitoring performed as part of the requirements of §290.111 resulting from the incorporation of 40 CFR §141.175(b), calibration records and records of backflow prevention programs. New subparagraph (C) requires water systems retain certain records for a period of five years after they are no longer in effect for records regarding a variance or exemption granted to the system and

concentration-time (CT) studies. New subparagraph (D) requires the results of microbiological analyses to be retained by the system for five years. New subparagraph (E) requires a ten-year retention for copies of monthly operating reports (MORs) and supporting documentation including turbidity monitoring results of the combined filter effluent; the results of chemical analyses; written reports, summaries or communications relating to sanitary surveys; and copies of the Customer Service Inspection Reports. In response to comments, the reference to “other pertinent data” contained in subparagraph (E)(v) was removed and a more specific requirement related to special studies and similar documents was adopted as subparagraph (F).

Adopted new §290.46(f)(4) requires water systems to submit any monthly or quarterly reports that are required by the executive director. Systems must submit their reports to the public drinking water program’s address, and the report must be submitted by the tenth day of the month following the period of time that the report covers (as per federal provision under 40 CFR §141.175(a)). The reports must contain all the information required by the drinking water standards and the results of any special monitoring test which have been required. This specifically includes reports resulting from 40 CFR §141.175(b)(1). The reports must be completed in ink, typed, or computer printed, and signed by the certified water works operator.

Adopted new §290.46(g) states when disinfection of new or repaired facilities is necessary.

Adopted new §290.46(h) requires that a supply of calcium hypochlorite be kept on hand and used when making repairs, setting meters, and disinfecting new mains prior to placing them in service.

Adopted new §290.46(i) addresses the adoption of plumbing ordinances, regulations, or services agreements by the public water system to insure that neither cross-connections nor other unacceptable plumbing practices are permitted and the use of pipes, fittings, solders, and flux is regulated.

Adopted new §290.46(j) contains customer service inspections requirements. The subsection specifies when an inspection certificate should be completed and who is capable of conducting the customer service inspection certification. New paragraph (2) requires the prompt elimination of potential contaminant hazards as they are discovered. The existence of a health hazard is sufficient grounds for immediate termination of water service. Service can not be restored until the hazard either no longer exist or is isolated. The inspections under this subsection are not acceptable substitutes for and do not apply to sanitary control requirements under §290.102(a)(5). A customer service inspection is limited and the inspector has no authority nor obligation beyond the scope of these regulations. A customer service inspection is not a plumbing inspection as defined and regulated by the Texas State Board of Plumbing Examiners and a customer service inspector is not permitted to perform plumbing inspections.

Adopted new §290.46(k) prohibits interconnection between a public drinking water supply distribution system and any other water supply unless the other water is of a safe, sanitary quality and the interconnection is approved by the executive director. Adopted new §290.46(l) contains requirements for the flushing of dead-end mains at monthly intervals or more frequently if the disinfectant residuals fall below acceptable levels.

Adopted new §290.46(m) requires that the maintenance and housekeeping practices used by a public water system ensure the reliability and general appearance of the system's facilities and equipment.

New paragraph (1) requires the inspection of ground, elevated, and pressure tanks annually. Specific determinations must be made for ground and elevated storage tanks and for pressure tanks during the inspection. The instrumentation and controls on tanks must also be inspected to ensure that they are working properly. New paragraph (2) specifies the inspection requirements for pressure filters. New paragraph (3) requires that the cartridges in cartridge filters be changed as specified by the manufacturer. New paragraph (4) requires that the storage facilities, distribution system lines, and related appurtenances be maintained in a watertight condition and free of excessive solids. New paragraph (5) requires that sedimentation basins be maintained free of excessive solids.

Adopted new §290.46(n) contains the specifications for engineering plans, specifications, maps, and other pertinent information and requires these documents to be maintained to facilitate the operation and maintenance of the facilities and equipment. New paragraph (1) requires public water systems maintain an accurate and up-to-date set of as-built plans and specifications. This requirement aids the system in complying with regulations and operating its system and assists the agency's field inspectors when they perform sanitary surveys of an individual water system. New paragraph (2) requires an accurate and up-to-date map of the distribution system be available so that valves and mains can be easily located during emergencies. New paragraph (3) requires that copies of well construction data, disinfection information, microbiological sample results, and a representative chemical analysis report be kept on file for as long as the well remains in service.

Adopted new §290.46(o) contains specifications for filter backwashing at surface water treatment plants. Filters are required to be backwashed when loss of head differential of six to ten feet is experienced between the influent and effluent loss of head gauges. Backwashing of filters is also required when the turbidity level of the filter effluent reaches 1.0 NTU to facilitate compliance with the 40 CFR §141.173(a).

Adopted new §290.46(p) specifies the information regarding water system ownership and management that must be provided to the agency. New paragraph (1) provides for notice when a water system changes ownership. New paragraph (2) requires annual written notice from each certified operator who supervised more than one system to contain the certificate number, address and telephone number, and the name and identification number of each public water system they supervise.

Adopted new §290.46(q) specifies special precautions to be instituted by the system in event of low distribution pressures, 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. New paragraph (1) contains specifications for the boil water notifications which must be issued to the customers within 24-hours. New paragraph (2) specifies how to determine if a boil water notification must be issued in the event of the loss of distribution system pressure and how long it shall remain in effect. New paragraph (3) specifies that 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 and specifies how long it shall remain in effect. New paragraph (4) specifies that other protective measure may be required at the discretion of the executive director.

Adopted new §290.46(r) contains provisions for minimum acceptable distribution system operating pressures of 35 pounds per square inch (psi) throughout the distribution system under normal conditions and 20 psi during emergencies such as fire fighting.

Adopted new §290.46(s) contains requirements for testing and monitoring equipment and requires this equipment to be periodically calibrated. In response to comments, this section has been amended to clarify that these calibration requirements apply only to those instruments used to gather data necessary to demonstrate compliance with state and federal regulations. New paragraph (1) requires flow meters to be calibrated once every 12 months. New paragraph (2) provides for the proper calibration of laboratory equipment. pH meters are to be calibrated once each day and checked with at least one buffer when samples are run. In response to comments, paragraph (2)(A) has been amended to include calibration requirements for on-line pH meters. Benchtop turbidimeters are to be calibrated with primary standards once every 90 days and checked with secondary standards every time a series of samples is run. On-line turbidimeters are to be calibrated with primary standards once every 90 days and checked weekly by comparison with a calibrated benchtop turbidimeter. In response to comments, paragraph (2)(B) has been amended to allow the weekly check on on-line turbidimeters to be done using manufacturers specified methods. Disinfectant residual analyzers are to be calibrated to enable systems to achieve compliance with the provisions of 40 CFR §141.173(a). Manual disinfectant residual analyzers are to be checked every 30 days using chlorine solutions of known concentrations. Continuous disinfectant residual analyzers are to be calibrated every 90 days using chlorine solutions of known concentrations and are to 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 results of approved benchtop amperometric, spectrophotometric, or titration method.

Adopted new §290.46(t) provides system ownership signage requirements.

Adopted new §290.46(u) requires abandoned public water supply wells owned by the system to be plugged. Wells that are not in use and are non-deteriorated must be tested every five years or as required by the executive director to prove that they are in a non-deteriorated condition. Test results must be sent to the agency. Deteriorated wells must be plugged or repaired to a non-deteriorated condition.

Adopted new §290.46(v) requires all electrical wiring to be installed in a securely mounted conduit in compliance with a local or national electrical code.

Adopted new §290.47(d), Customer Service Inspection Certificate, contains the requirements for customer service inspections.

Adopted new §290.47(f), Backflow Prevention Assembly Test and Maintenance Report, is the required form that a certified backflow prevention assembly tester must complete when performing annual inspections of backflow prevention assemblies. In response to comments, the form has been modified to add a reference to “spill resistant breaker,” to add a line confirming whether the assembly was installed according to the manufacturer’s instructions, to add a line for tested pressure under “2nd check,” and to clarify that the tester certifies the forms contents to be true only at the time of testing.

Adopted new §290.47(i), Assessment of Hazards and Selection of Assemblies, identifies specific health hazards that are regulated under the provisions of §290.44(h). In response to comments, a statement

has been added to the appendix to clarify that the list does not constitute an all-encompassing list of health hazards that can exist. Also, to minimize the need for premises isolation, staff added watering troughs to the list of health hazards requiring internal protection and, in response to comments, steam plants and ornamental fountains have been reclassified.

Adopted new Subchapter F, Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems, contains requirements for each regulated chemical or contaminant, and general analytical, monitoring, and notification requirements.

Adopted new §290.101, Purpose, explains that the purpose of the rules is to assure the safety of public water supplies through control test, laboratory checks, operating records, and reports.

Adopted new §290.102, General Applicability, provides that the subchapter applies to all public water systems unless the system meets the provisions found in this section. Variances and exemptions may be granted by the executive director. Requirements for these variances and exemptions for one or more of the maximum contaminant levels (MCLs) or treatment technique and the application procedures for these are discussed. Modified monitoring may be granted by the executive director. In response to comments, the language has been modified to clarify that the submission of a request for a variance or exemptions must be accompanied by general planning documents, and that if the request is granted, the system must submit detailed plans.

Adopted new §290.103, Definitions, provides definitions for technical terms contained in this subchapter. In response to comments, the definitions of “enhanced coagulation” and “enhanced

softening” has been brought into closer correlation with the federal rules. Also in response to comments, the definition of “maximum contaminant level” has been clarified.

Adopted new §290.104, Summary of Maximum Contaminant Levels, Maximum Residual Disinfectant Levels, Treatment Techniques, and Action Levels; summarizes the primary MCLs, maximum residual disinfectant levels (MRDLs), treatment techniques, and action levels. This section provides a listing of all regulated contaminants in a single location. Maximum contaminant levels for inorganic compounds, organic compounds, volatile organic contaminants, radiological contaminants, microbial contaminants, minimum and MRDLs, turbidity, disinfection by-product precursors, disinfection by-products, and lead and copper action levels. In response to comments, the purpose of this section has been clarified. This section is provided as a reference to those who wish to quickly look up a MCL, MRDL, action level, or treatment technique.

Adopted new §290.105, Summary of Secondary Standards, summarizes the secondary constituents and their maximum levels. In response to comments, the purpose of this section has been clarified. In response to comments, the purpose of this section has been clarified. This section is provided as a reference to those who wish to quickly look up a secondary constituent level (SCL).

Adopted new §290.106, Inorganic Contaminants, contains the requirement for inorganic contaminants (IOCs). The applicability, MCLs or treatment technique requirements, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and public notice requirements for inorganic contaminants, and best available technology for treatment are discussed in this section. In response to comments §290.106(c)(7)(A)(i) has been amended to correct a

typographical error. In response to comments, §290.106(e) has been amended to clarify that results of chemical analysis must be submitted ten days after the system receives the results of the analysis from the laboratory, not ten days after the sample was taken.

Adopted new §290.107, Organic Contaminants, contains the applicability, MCLs or treatment techniques requirements for synthetic organic contaminants and volatile organic contaminants, monitoring requirements, analytical requirements, reporting requirements, compliance determination, public notice requirements for organic contaminants, and best available technology for treatment for these compounds. In response to comments, §290.107(c)(2)(C)(iv) has been amended to correct a typographical error. In response to comments, §290.107(e) has been amended to clarify that results of chemical analysis must be submitted ten days after the system receives the results of the analysis from the laboratory, not ten days after the sample was taken.

Adopted new §290.108, Radiological Sampling and Analytical Requirements, contains the applicability, MCLs, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and public notification requirements. In response to comments, references within §290.108 to “suppliers of water” were corrected as “public water system.” In response to comments, §290.108(e) has been amended to clarify that results of chemical analysis must be submitted ten days after the system receives the results of the analysis from the laboratory, not ten days after the sample was taken.

Adopted new §290.109, Microbial Contaminants, contains provisions for the applicability, MCLs, monitoring requirements, analytical requirements, reporting requirements, compliance determination,

and public notification requirements related to these contaminants. In response to comments, §290.109(e) has been amended to clarify that results of microbiological analysis must be submitted ten days after the system receives the results of the analysis from the laboratory, not ten days after the sample was taken.

Adopted new §290.110, Disinfectant Residuals, contains the applicability, minimum and maximum acceptable disinfectant concentrations, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and public notification requirements. Subsection (b)(3) incorporates the MRDL for the disinfectant chlorine dioxide of 40 CFR §141.65(a). Subsection (b)(5) incorporates the federally imposed MRDL for chlorine and chloramines of 40 CFR §141.65(a). Subsection (c) contains disinfectant monitoring requirements. In response to comments, this subsection has been amended and portions were numbered to clarify which requirements apply to groundwater systems. The figure that was contained in §290.110(c)(3)(A) was renumbered to §290.110(c)(2)(B)(i) and the text of the figure did not change. Subsection (c)(2) incorporates the federally imposed chlorine dioxide monitoring requirements of 40 CFR §141.132(c)(2). Subsection (e) contains the reporting requirements for disinfectants. In response to comments, subsection (e) has been amended to clarify that results of chemical analysis must be submitted ten days after the system receives the results of the analysis from the laboratory, not ten days after the sample was taken. In response to comments, subsection (e)(2) has been amended to clarify that after January 1, 2001, systems must submit TNRCC Form 00102. Subsection (f)(5) incorporates requirements relating to chlorine dioxide compliance determination in response to 40 CFR §141.133(c)(2). Subsection (f)(7) incorporates requirements relating to chlorine and chloramine compliance determination in response to 40 CFR §141.133(c)(1). Subsection (f)(8) provides that systems 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 as required by 40 CFR §141.130(d). In response to comments, subsection (f)(9) has been added to clarify that if a system's failure to monitor makes it impossible to determine compliance, then the system is in violation of MRDLs. Subsection (g)(1) contains the requirement for public notice in the event of an exceedance of the maximum residual disinfectant residual for chlorine dioxide as required by 40 CFR §141.133(2). Subsection (g)(4) contains the requirement for public notice in the event of an exceedance of the maximum residual disinfectant residual for chlorine and chloramines as required by 40 CFR §141.133(1).

Adopted new §290.111, Turbidity, contains the applicability, treatment technique requirements, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and public notification requirements. The federal requirements of the IESWTR apply to public water systems that service at least 10,000 people and utilize surface water or groundwater under the direct influence of surface water. The state rule applies to all surface water systems and groundwater systems under the direct influence of surface water regardless of the population served. In response to comments, §290.111(c)(5)(A) has been added to specify that filter profiles must be completed within seven days of exceeding the filtered water turbidity levels. In response to comments, §290.111(c)(5)(B) has been added to clarify that each time a filter exceeds the filtered turbidity level under specific timeframes, the system must conduct a filter assessment. In response to comments, §290.111(c)(5)(C) has been added to clarify that each time the filtered water turbidity exceeds specified turbidity levels, the system must participate in a comprehensive performance evaluation.

Adopted new §290.111(b)(2)(C) provides that the executive director may extend the compliance date for the turbidity standards for systems serving fewer than 10,000 people but not beyond January 1, 2004, the effective date of the DBP1R requirements for small systems. Subsection (b)(3) contains the new treatment technique requirements for individual filter effluent at plants serving 10,000 people or more and treating surface water or groundwater under the direct influence of surface water as required under of 40 CFR §141.173(a). Subsection (b)(3)(A) requires that, beginning January 1, 2002, the turbidity from each individual filter at plants serving 10,000 people or more and treating surface water or groundwater under the direct influence of surface water should not exceed 0.5 NTU at four hours after the individual filter is returned to service after backwash or shut down as part of the requirements under 40 CFR §141.175(b)(2). Subsection (b)(3)(B) requires that, beginning January 1, 2002, the turbidity from each individual filter should never exceed 1.0 NTU at plants serving 10,000 people or more and treating surface water or groundwater under the direct influence of surface water as part of the requirements of 40 CFR §141.175(b)(1).

Adopted new §290.111(c) contains turbidity monitoring requirements as required by 40 CFR §141.175(a). Subsection (c)(3) contains the individual filter turbidity monitoring requirements for individual filters at plants serving 10,000 or more people and treating surface water or groundwater under the direct influence of surface water as required by 40 CFR §141.174. Subsection (c)(4) contains individual filter turbidity monitoring requirements for individual filters at plants serving fewer than 10,000 people and treating surface water or groundwater under the direct influence of surface water. Subsection (c)(5) contains special individual filter turbidity monitoring and analysis requirements for individual filters at plants serving 10,000 or more people and treating surface water or groundwater under the direct influence of surface water as required by 40 CFR §141.175(b). Subsection (c)(5)(A)

requires that each time a filter exceeds 1.0 NTU anytime during a filter run, or exceeds 0.5 NTU at four hours after backwash, for two consecutive 15-minute readings, the system must either identify the cause of the exceedance or complete a filter profile on the filter as provided in 40 CFR §141.175(b)(2). Subsection (c)(5)(B) requires that each time a filter exceeds 1.0 NTU anytime during a filter run, or exceeds 0.5 NTU at four hours after backwash, 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 as provided in 40 CFR §141.175(b)(1). Adopted new §290.111(c)(5)(B) has been revised to clarify that a filter assessment is required only if an individual filter produces water with a turbidity above 1.0 NTU on three separate occasions during any consecutive three-month period. Subsection (c)(5)(C) requires that each time that any combination of 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) as provided in 40 CFR §141.175(b)(2)(4).

Adopted new §290.111(d)(3) requires that plants serving 10,000 or more people and treating surface water or groundwater under the direct influence of surface water must measure turbidity using continuous on-line turbidimeters on each filter as provided in 40 CFR §141.174(a). Subsection (d)(4) requires that individual filter turbidity at plants serving fewer than 10,000 people and treating surface water or groundwater under the direct influence of surface water must be measured using grab sampling and bench-top turbidimeters.

Adopted new §290.111(e) incorporates the reporting requirements for turbidity as provided in 40 CFR §141.175. Adopted new §290.111(e)(2) - (5) has been modified to clarify that the term “MOR”

referred to the current Monthly Operating Report for Surface Water Treatment Plants. Subsection (e)(3) requires that plants serving 10,000 or more people and treating surface water or groundwater under the direct influence of surface water which are required to do a filter profile must submit a Filter Profile Report for Individual Filters with their MOR as provided in 40 CFR §141.175(b)(1) and (2). Subsection (e)(4) requires that plants serving 10,000 people or more and treating surface water or groundwater under the direct influence of surface water that are required to do a filter assessment must submit a Filter Assessment Report for Individual Filters with their MOR as provided in 40 CFR §141.175(b)(3). Subsection (e)(5) requires that plants serving 10,000 people or more and treating surface water or groundwater under the direct influence of surface water that are required to do a CPE must submit a Request for Compliance CPE with their MOR as provided in 40 CFR §141.175(b)(4). Subsection (f) contains the compliance determination procedures for the turbidity regulations and subsection (g) establishes the public notification requirements. In response to comments, §290.111(e)(2) has been modified to clarify that after January 1, 2001, systems must submit the new MOR, TNRCC Form 00102.

Adopted new §290.112, Total Organic Carbon (TOC), contains the provisions needed to implement the provisions of the Stage 1 DBP1R pertaining to the monitoring and control of disinfection by-product precursors. Regulations regarding applicability, treatment technique, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and publication notification are specified. The staff corrected a technical defect in the proposed §290.112(a) by specifying that the adopted subsection is applicable only for those systems that are using sedimentation or clarification facilities as part of their treatment process. In response to comments, §290.112(c)(3) - (5) has been amended to correct typographical errors. In response to comments, §290.112(e)(3)(E) has been

amended to require that systems meeting alternative compliance criteria number eight must report the source water and treated water magnesium levels and the average percentage of magnesium that was removed during each of the preceding 12 months. The staff has also clarified the reporting requirements contained in §290.112(e)(3)(C) and (D). In response to comments, §290.112(f)(3)(A) has been amended to meet the federal requirement that the monthly percent removal must be calculated based on the average removal of all TOC sample sets taken in a month. In response to comments, §290.112(f)(3)(D) has been amended to base compliance on the running annual average of the quarterly averages of the monthly averages as required by the federal rule.

Adopted new §290.113, Disinfection By-products (TTHM and HAA5), incorporates the provisions of the Stage 1 DBP1R relating to disinfection by-products (TTHM and HAA5). Regulations regarding applicability, MCL, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and publication notification are specified. In response to comments, §290.113(e) has been amended to clarify that results of chemical analysis must be submitted ten days after the system receives the results of the analysis from the laboratory, not ten days after the sample was taken.

Adopted new §290.114, Disinfection By-products Other than TTHM and HAA5, incorporates the provisions of the Stage 1 DBP1R relating to disinfection by-products other than TTHM and HAA5 and contains regulations for chlorite and bromate. Subsection (a) contains provisions for MCL, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and publication notification. Subsection (b) contains provisions for MCL, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and publication notification.

In response to a technical correction in the corresponding federal regulations, new §290.114(a) regarding the applicability of the chlorite regulations has been revised to apply only to community and nontransient, noncommunity public water systems.

Adopted new §290.115, Transition Rule for Disinfection By-products, applies to all public water systems serving at least 10,000 people until January 1, 2002, if a system uses surface water or groundwater under the direct influence of surface water and until January 1, 2004, if the system uses only groundwater sources that are not under the direct influence of surface water. After those dates, systems must comply with §290.113, relating to disinfection by-products (TTHM and HAA5).

Regulations regarding applicability, MCL, and sampling and analytical requirements for total trihalomethanes are specified. In response to comments, §290.115(e) has amended to clarify that analysis for TTHM must be performed at a laboratory certified by the TDH Bureau of Laboratories.

Adopted new §290.117, Regulation of Lead and Copper, contains provisions for general requirements, site selection and material survey, tap sampling, computing 90th percentile lead and copper levels, reduced tap monitoring, monitoring requirements for water quality parameters and source water, public education procedures, corrosion control, lead service line replacement, analytical and sample preservation methods, and reporting and record keeping requirements.

Adopted new §290.118, Secondary Constituent Levels, contains provisions for applicability, SCLs, analytical requirements, reporting requirements, compliance determination, and public notification. In response to comments, §290.118(e) has been amended to clarify that results of chemical analysis must be submitted ten days after the system receives the results of the analysis from the laboratory, not ten

days after the sample was taken. In response to comments, §290.118(e)(1) has been amended to clarify the monitoring requirements for SCLs. In response to comments, §290.118(e)(3) has been amended to clarify that a system which exceeds a SCL commits a SCL violation. In response to comments, §290.118(f)(1) was reworded to correct word usage.

Adopted new §290.119, Analytical Procedures, contains provisions for acceptable laboratories, acceptable analytical methods, and process control tests.

Adopted new §290.121, Monitoring Plans, contains provisions for applicability, monitoring plan requirements, reporting requirements, compliance determination, and public notification. In response to comments, §290.121(b)(5) has been clarified to include compliance with MRDLs.

Adopted new §290.122, Public Notification, incorporates the provisions of the Stage 1 DBP1R relating to monitoring plans. This section contains provisions for public notification requirements for acute violations; public notification requirements for other MCL or treatment technique violations; public notification requirements for other violations, variances, and exemptions; notice to new billing units and proof of public notification.

FINAL REGULATORY IMPACT ANALYSIS DETERMINATION

The commission has reviewed the rulemaking in light of the regulatory analysis requirements of Texas Government Code, §2001.022, and has determined that, except as described in the following paragraph, the rulemaking is not subject to §2001.0225 because it does not meet any of the four applicability requirements as defined in that statute. The portions of the rules implementing the federal IESWTR

and the Stage 1 DBP1R are required by federal law (the Safe Drinking Water Act) and the regulations under 40 CFR Parts 9, 141, and 142.

The portion of the rules which extends a removal requirement for *Cryptosporidium* oocysts to small public water systems, serving fewer than 10,000 people and utilizing surface water or groundwater under the direct influence of surface water, are not covered under the federal rule. This portion of the rules is adopted pursuant to THSC, §§341.031, 341.0315, and 341.035. Because this portion of the rule may meet the requirement for a regulatory impact analysis under Texas Government Code, §2001.0225, the commission has prepared a regulatory impact analysis.

Those portions of the rules that do not implement the federal rules, do not exceed any express requirement of state law. Those requirements are adopted pursuant to the THSC, §341.0315 and §341.035. This does not exceed a requirement of any delegation agreement or contract between the state, TNRCC, and an agency or representative of the federal government. The rules are not adopted solely under the general powers of the agency; the rules are adopted pursuant to the THSC, §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 United States Code (USC), §300f et. seq; THSC, §341.0315, which requires public water supply systems to meet the requirements of commission rules, and THSC, §341.035, which requires the executive director of the commission to approve plans and specifications for public water supply systems. The rules are not adopted on an emergency basis.

The current state rules for all public water systems treating surface water or groundwater under the direct influence of surface water requires the removal or inactivation of both *Giardia lamblia* cysts and

viruses before the water is supplied to any consumer. Those removal standards will be deemed to be met by systems using conventional media filtration if the system achieves a specific combined filter effluent (CFE) turbidity standard (i.e., the CFE turbidity level that never exceeds 5.0 NTU and is 0.5 NTU or less in at least 95% of the samples tested each month) and provides a specific level of disinfection. The new federal IESWTR requires systems that serve more than 10,000 people, beginning January 1, 2002, to also achieve at least a 2-log removal of *Cryptosporidium* oocysts. Under the federal rules for systems using conventional media filtration, that standard will be deemed to be achieved if the CFE turbidity level never exceeds 1.0 NTU and is 0.3 NTU or less in at least 95% of the samples tested each month. The federal rules also require, beginning January 1, 2002, systems that serve at least 10,000 people to continuously monitor the turbidity of the filtered water from each individual filter with a continuous on-line turbidimeter and a continuous recorder. Under the federal requirements of the IESWTR, systems serving under 10,000 people would continue under the existing turbidity standards.

The adopted rules strengthen the turbidity standards for all public water systems in Texas that treat surface water sources or sources of groundwater that are under the direct influence of surface water. The adopted rules require that, beginning January 1, 2002, small systems treating surface water or groundwater under the direct influence of surface water also achieve a 2-log removal of *Cryptosporidium* oocysts. For plants using conventional media filtration, removal is demonstrated by a combined filter effluent turbidity that never exceeds 1.0 NTU and is 0.3 NTU or less in at least 95% of the samples tested each month. Small systems will be required to measure individual filter turbidity at the effluent of each individual filter and record the turbidity value at least once each day that the plant is in operation. Small systems would be allowed to monitor individual filter turbidity by measuring the

turbidity level in grab samples with a benchtop turbidimeter. The rules also provide that for systems serving fewer than 10,000 people, the executive director could extend the compliance date for the new turbidity treatment levels up to January 1, 2004.

The new turbidity treatment levels for public water systems treating surface water or groundwater under the direct influence of surface water are intended to address the risk of *Cryptosporidium* oocysts in drinking water supplies. Ingestion of active *Cryptosporidium* oocysts is the cause of the disease *Cryptosporidiosis*. Symptoms of *Cryptosporidiosis* include diarrhea, abdominal discomfort, nausea, and vomiting. While otherwise healthy persons may expect a complete recovery from *Cryptosporidiosis*, it can be very serious in immuno-compromised persons. Immuno-compromised persons include infants, pregnant women, the elderly, cancer patients undergoing chemotherapy, HIV/AIDS patients, and people on immunosuppressant drugs. There is no effective therapeutic drug to cure *Cryptosporidiosis*. Therefore, the prevention and avoidance of infection is central to minimizing the risks of outbreaks. Infected humans, cattle, deer, and other animals excrete large numbers of *Cryptosporidium* oocysts and consequently, *Cryptosporidium* appears to be common in the environment. Runoff from watersheds allows transport of these microorganisms to water bodies used as intake sites for drinking water treatment plants. While transmission of the disease can result from the direct or indirect contact with infected persons or animals, the majority of large epidemic outbreaks have been the result of ingesting contaminated drinking water.

The commission has determined that the new turbidity treatment levels are necessary to provide protection against *Cryptosporidium* because the current turbidity treatment standards are inadequate to assure adequate removal of oocysts. Increasing the current disinfection treatment levels with common

disinfectants does not appear to be an effective control strategy because the *Cryptosporidium* oocysts are especially resistant to those common disinfectants. Not extending the new turbidity treatment levels to small systems would continue to expose approximately 660,000 Texas residents to the risk of *Cryptosporidiosis*.

The commission anticipates the benefits from adoption and implementation of the rules will be improved public health by increasing the level of protection from exposure to *Cryptosporidium* and other pathogens and the avoidance of resulting health costs and avoidance of possible deaths due to *Cryptosporidiosis*.

The commission anticipates that most small public water systems required to meet the new combined filter turbidity treatment standard will be able to meet the new standard with existing personnel and equipment by changes to operating procedures. These changes may increase the operational cost of the plant due to additional chemicals needed. In some cases, the amount of chemicals used to treat the water may be reduced, with a corresponding reduction in chemical costs. A few small public water systems may have to renovate their water treatment plants to comply with the new combined filter turbidity treatment standard. In those cases, the commission will extend the compliance date for the new turbidity treatment levels to the compliance date of the January 1, 2004. This extended compliance date is to allow those small systems to seek funding, and construct new facilities that would come on-line by January 1, 2004. Therefore, capital costs associated with small system compliance are not anticipated to be incurred until 2003 when systems are building new facilities to be in compliance by 2004.

The estimate of the population served by small water systems was obtained from a database of public drinking water systems maintained by TNRCC. Exposure of that population to *Cryptosporidium* oocysts is estimated at 8.0%. That estimate was obtained from the EPA database on the Information Collection Rule and is based on the December 1997 information of *Cryptosporidium* detects in Texas. The commission used information from a single month because exposure anytime during the year could result in an incidence of *Cryptosporidiosis*. Information from other months was not used because a lack of detection of *Cryptosporidium* in a sample does not indicate an absence of *Cryptosporidium* in the source water due to limitations of the analytical methods used. The 8.0% figure was used because it represents occurrence data specific to Texas. It is much lower than the reported national estimate of 60% *Cryptosporidium* occurrence in source water. The exposure estimate was further reduced by the estimate that only 10% of detected *Cryptosporidium* oocysts would be viable. The probability of occurrence of disease given an exposure to *Cryptosporidium* was estimated at 39% and at that probability, it is estimated there would be one death every five years. The probability of mortality was estimated based on the Milwaukee outbreak data of 50 deaths per 400,000 illnesses. An average cost of medical treatment per illness of \$2,000 was used to estimate health damages avoided. This estimate was developed by the Centers for Disease Control (CDC). An average value of \$5.6 million per life saved was used to estimate the benefits of death avoided. This national average was developed by the EPA and is used by the EPA for a number of different rules.

The commission has estimated the costs for state agencies, local governments, the public, and the regulated community for the first five years that small public water systems, those serving fewer than 10,000 people, are subject to the new turbidity standard. There are 299 small systems subject to the rules. Most of these systems are owned and operated by local governments. Sixty-one of the small

systems are investor-owned utilities. The cost for these small investor-owned utilities to comply with the new turbidity standard do not differ from other small public water systems. Eleven of the small public water systems subject to the new standard are owned and operated by the state.

For the first year (2002) that small public water systems will have to comply with the new turbidity standard, the commission estimates 196 of the 299 small systems subject to the rules will comply with the new standards with no significant costs. Approximately 50 systems will be able to comply with some problems. The commission estimates the total costs of compliance with the new standard for these 50 systems to be \$152,000. The total cost was calculated by assuming a 10% increase in chemicals at three cents per 1,000 gallons water usage for 50 plants near compliance and assuming typical values for water usage, the average cost to comply for these systems is \$3,040 ($50 \times \$3,040 = \$152,000$). These costs include chemicals only and do not include capital costs.

Approximately 53 systems will have major problems complying. The commission will grant compliance waivers under provision of the new rules to systems that require capital improvements. Therefore, no capital costs are anticipated to be incurred by systems in the year 2002.

The State of Texas operates three plants in this category. The estimated cost to the state to comply with the new standard in the year 2002 is \$3,600 for chemicals, based upon water usage.

The new standard would require all small public water systems to achieve removal by January 1, 2004. Some small systems will have to undertake capital improvements ranging from installation of new filters to complete construction of new water treatment plants in order to comply with the new standard. The commission estimates that these capital improvements will occur in 2003 so that the improvements will

be in place before the January 1, 2004 compliance deadline. Therefore, cost estimates starting in 2003 include capital costs.

For the year 2003 and each year thereafter, total costs for all systems to comply with the new standard is estimated by the commission at \$1,900,000. In addition to the chemical costs estimated as described for the year 2002, capital costs were included. Based on monitoring data, 22 small systems were judged to be capable of complying with the new standard by major operation and maintenance changes or minor plant modifications, such as replacement of filter media and changes to flow control devices. Calculation of costs for these plants to comply is difficult because the true costs depends on plant specific modifications. The commission assumed a typical repair cost of \$25,000 per system and annualized that cost over an assumed six-year useful life for a filter.

Ten systems were judged to require an entirely new treatment plant. A new plant was estimated to cost \$768,268. Plant costs were estimated at \$1.20 per gallon per day of plant capacity. Average population served for these systems, typical values for housing occupancy, water consumption and 6.0% cost of capital for 20 years were used to arrive at an estimated average annual cost per plant of \$67,000. With the addition of chemical costs, the average annual cost for these systems with the worst compliance history are estimated at \$70,651. A telephone survey of the systems judged most likely to require major capital investment to meet these rules found that half of the plants were already in the process of expanding, improving, or replacing their existing facilities for reasons other than these rules.

There are 21 small public water systems that fall in between those systems that will require new plants and those systems that will be able to comply by minor modifications to their plants. The estimated

average cost for one of these plants to comply was \$39,781. An average annual cost mid-range between the cost of a new plant and a \$25,000 per system was used to estimate the cost for these systems to comply with the rules.

The State of Texas owns a total of 11 small plants that will incur capital costs to comply with the new standards. The annual cost to the state to comply is estimated, using the assumptions previously mentioned, at \$154,000. These cost figures have not been adjusted for inflation in future years. These costs overstate the cost to comply with the new turbidity standard because the costs for new water treatment plants are not simply to comply with the new standards. Those systems building new plants are in large part systems whose plants have reached the end of their useful lives or that have not performed routine maintenance to keep their plants in good repair and operation. The need for new plants, in many cases, would still be required to come into compliance with the current drinking water standards. The highest costs are estimated for small systems requiring new plants.

Some of those systems may seek less costly alternatives, such as connecting into a larger regional water system, which may be the only alternative for many.

The commission has estimated the average cost to the public for extending the turbidity standard to small systems is 72 cents per household per month. The public will be subject to a range of possible cost effects of these rules. Well operated and maintained public water systems, the majority of the small systems, will see little increase in costs. Customers of these systems should not experience any increase in their monthly water bill as a result of this new turbidity standard. Other systems that incur small increased costs may be in a financial condition where they are able to avoid passing increased

costs on to their customers. At the other end of the spectrum, for small systems building new plants and passing all of these costs on to their customers, the public can expect increases to their monthly water utility bill. The commission's estimates for costs to the public were based on the assumptions that all costs would be passed on to customers, an average of three persons per household, and that annual costs would be spread evenly over all households. Based on these assumptions and the costs developed, the cost to the public for the extension of the turbidity standard to small systems is expected to range from no increase in the monthly water utility bill to an \$8 per household per month increase. The high end of the range might be estimated too low because an average value for plant cost for small plants was used. The smallest plants would incur costs higher than the average cost. The high end of the range might be estimated too high because the commission has assumed that all costs for any new plant is due to the rules, when most of any new plant cost must be incurred even without the rules. The average monthly increase for the customers of all small public water systems is expected to be 72 cents per household per month.

The commission believes the adopted rules to physically remove *Cryptosporidium* oocysts is the most reasonable method to reduce the risk of ingestion of *Cryptosporidium* oocysts from drinking water. *Cryptosporidium* oocysts are especially resistant to disinfection practices commonly used at water treatment plants. Simply increasing existing disinfection levels above those most commonly practiced in Texas does not appear to be an effective control strategy for *Cryptosporidium*. The adopted rules strengthen the effectiveness and reliability of physical removal for particulate matter and microorganisms in general, thereby reducing the likelihood of the disinfection barrier being over-challenged. Waterborne disease outbreaks have been associated with a high level of particles passing through a water treatment plant. Hence, there is a need to optimize treatment reliability and to enhance

physical removal efficiencies to minimize the *Cryptosporidium* levels in finished water. These rules are formulated to address these public health concerns.

The commission based its facts and cost estimates set out in this final regulatory impact analysis determination on sources that it believes to be reliable. Much of the information on *Cryptosporidium* is from the preamble to the final federal IESWTR. Additional information was obtained from *Benefits and Costs of the IESWTR*, 91 AWWA Journal 148 (April 1999); *Assessing the Risk Posed by Oocysts in Drinking Water*, 88 AWWA Journal 131 (September 1996). *Giardia and Cryptosporidium in Raw and Finished Water*, 87 AWWA Journal 54 (September 1995). The information on the occurrence of *Cryptosporidiosis* was obtained from the Information Collection Rule database maintained by the EPA. The estimate of the monetary benefits of forgone occurrences of that disease are from the CDC and were reported in the preamble to the federal rules. The information on the number of systems and population potentially effected by the rules was obtained from databases that TNRCC maintains on public drinking water systems in Texas. The judgments of the level of effort necessary for small systems to comply with these rules and associated costs are necessarily estimates. Those estimates are based on staff's experience, particularly with the Texas Optimization Program that has provided technical assistance to over 55 surface water and groundwater systems under the direct influence of surface water in Texas with the aim to lower their system turbidity to levels that will meet or exceed the rule requirements.

The commission considers the turbidity standards for public water systems serving under 10,000 people and utilizing surface water or groundwater under the direct influence of surface water to be a performance-oriented method of compliance. Systems subject to the regulation are granted the

regulatory flexibility to select their own method of achieving removal of *Cryptosporidium* oocysts. The tests necessary to demonstrate removal of *Cryptosporidium* oocysts are inaccurate, unreliable, and expensive. Therefore, the rules use a surrogate standard that the commission will accept as demonstrating the appropriate level of removal. For systems using conventional media filtration, the commission will recognize the 0.3 NTU or less in at least 95% of the samples tested each month test and no measurements above 1.0 NTU as a demonstration that the system is meeting the removal standard. For those systems wishing to utilize membrane treatment methods, the executive director will approve site specific treatment technique standards. A more specific surrogate test was not adopted for membrane systems because the technology is changing so rapidly that the commission does not want to exclude from use scientifically acceptable surrogate standards that may be developed shortly. Those systems wishing to utilize other innovative or alternative treatment methods to achieve the removal standards will be allowed to do so using executive director approved alternatives, which is the current practice for innovative or alternative treatment technologies.

TAKINGS IMPACT ASSESSMENT

The commission has prepared a takings impact assessment for these rules pursuant to Texas Government Code, §2007.043. The following is a summary of that assessment. The specific purpose of the rules is to implement the federal IESWTR, and the Stage 1 DBP1R, 40 CFR Parts 9, 141, and 142. The rules also will make changes to the state design criteria for some water treatment plant processes and clarify existing regulatory requirements. The rules will substantially advance these specific purposes by adopting provisions that implement the federal rules cited and by adopting amendments to the state design criteria for water treatment plants. Promulgation and enforcement of these rules will not significantly burden private real property because private real property is not subject

to these rules. Moreover, the adopted rules are in response to a real and substantial threat to public health and safety, the proposal is designed to significantly advance the health and safety purpose and does not pose a greater burden than is necessary to achieve the health and safety purpose.

CONSISTENCY WITH THE COASTAL MANAGEMENT PROGRAM

The executive director has reviewed this rulemaking and found that the rules are neither identified in Coastal Coordination Act Implementation Rules, 31 TAC §505.11(b)(2), relating to Actions and Rules Subject to the Texas Coastal Management Program (CMP), nor will it affect any action or authorization identified in Coastal Coordination Act Implementation Rules, 31 TAC §505.11(a)(6). Therefore, the adopted rules are not subject to the CMP.

HEARING AND COMMENTERS

The proposed rules were published in the April 21, 2000 issue of the *Texas Register* (25 TexReg 3420). A public hearing for this rulemaking was held in Austin on May 12, 2000. The comment period closed on May 21, 2000.

A total of 20 commenters provided both general and specific comments on the proposed rules. The following commented on the proposal: Bac-Flo Unlimited (BFU); Cedar Ridge RV Park (CRRV); City of College Station (COCS); City of Fort Worth (COFW) commented by letter and in the hearing; City of Pearland (COP); City of Carrollton (COC); City of Arlington (COAr); City of Austin (COAu); Control Flow, Inc. (CF); Eco-Resources/District Office (Eco/District) commented by letter and in the hearing; Eco-Resources/Donna Office (Eco/Donna); Houston Area Plumbing Joint Apprenticeship Committee (HAPJAC); Northeast Texas Municipal Water District (NETMWD); Safewater Solutions

(SS) commented by letter and in the hearing; Texas Department of Insurance (TDI), State Fire Marshal's Office (TDI); Texas Chemical Council (TCC); Texas Municipal League (TML); TXU Business Services (TXU); and Upper Trinity Basin Water Quality Compact (UTBWQC). One additional comment from the U.S. Environmental Protection Agency (EPA) was received after the close of the comment period and was also considered in the analysis of testimony.

Of these commenters, four indicated that they were generally in favor of the proposal; two of these recommended specific changes. Fourteen expressed no support or opposition but suggested specific changes. Two were opposed to the rules. Of these, CRRV was generally opposed, and TML was opposed to specific portions of the rules and suggested changes.

ANALYSIS OF TESTIMONY

GENERAL COMMENTS

CRRV questioned the overall purpose of the rule changes, with respect to the protection of public health.

The commission responds that the purpose of these rule changes is to comply with federal rules and to protect the public health. The rules primarily address two areas of public health: microbial pathogens and potentially carcinogenic disinfection by-products. Disinfection is necessary to kill many pathogens in drinking water, but it may create potentially carcinogenic disinfection by-products.

A recently identified microbial pathogen, *Cryptosporidium*, is responsible for many cases of gastroenteric illness. In those people who have weakened immune systems, *Cryptosporidiosis* may cause death. Traditional methods of disinfection are ineffective against *Cryptosporidium* oocysts. The EPA estimated that the likelihood of endemic illness from *Cryptosporidium* will decrease by 20% by reducing the required combined filter effluent turbidity level for systems that serve 10,000 people or more (63 Fed Reg 69500 - 69503, December 16, 1998). *Cryptosporidium* is common in the environment. Turbidity is used as a surrogate measure of the potential presence of pathogens such as *Cryptosporidium*, because waterborne disease outbreaks have been associated with a high level of particles passing through a water treatment plant. Therefore, the rules include turbidity requirements for plants treating surface water or groundwater under the direct influence of surface water.

There is evidence that chlorination of water produces undesirable disinfection by-products. Studies have suggested an association between bladder, rectal and colon cancer, and exposure to chlorinated surface water. A recent study has suggested an association between early term miscarriage and exposure to drinking water with elevated trihalomethane levels. Therefore, the rules include requirements regarding MCLs for disinfection by-products. Phased implementation was agreed upon during the regulatory negotiation process between stakeholders and the EPA, so the rules affect large systems before small systems. The rules will be revisited by congressional mandate, and the Stage 2 Disinfectants and Disinfection By-Products rule will be promulgated by EPA in 2001.

CRRV suggested that the state pay for the changes or offer to purchase economically non-viable systems.

The commission responds that the federal provisions do not allow us to generally exempt systems from the rules based on economic impact. Additionally, the state does not have the statutory authority to operate drinking water systems or to pay for changes to a system. In developing the federal rules, EPA determined that the rules fell under Title II of the Unfunded Mandates Reform Act of 1995, Pub. L. 104-4. Under this statute, EPA may not issue regulations that are not required by statute and that create a mandate upon a state, unless the federal government either provides the funds necessary to pay the direct compliance costs, or EPA consults with the affected governments. In developing these rules, EPA consulted with state and local governments. Before promulgating the federal rules, EPA held extensive meetings with a variety of state and local representatives who provided input in the development of the proposed rules. Through that process, EPA determined the likely costs and benefits of various options, and promulgated the option which protected the public health while considering economic costs. Additionally, EPA provides some funds through the Drinking Water State Revolving Fund to help with costs incurred for drinking water systems.

CRRV suggested that the new requirements should not be applied to businesses below some economic level or to systems built prior to this rulemaking. Further, CRRV expressed dissatisfaction with the fiscal implications of the rule changes, and the probable negative impact on the profitability of their system.

The federal provisions do not allow us to exempt public water systems from meeting the regulations on the basis of age, profitability, or economic level, because all citizens are deemed equally deserving of safe potable water regardless of the size of their community. Smaller systems are required to do less sampling than large systems because of the fiscal impact, but the standards for the water they deliver to the public are the same as for large systems.

CF commented that there are many water wells for private use and that it would be unfair to place excessive financial burdens on these users who do not sell water.

The commission responds that the adopted rules only apply to public water systems, not to water well users who do not sell water or operate a public water system. The definition of “public water system” does not include private domestic wells.

COC commented that the version of the document in the *Texas Register* was not the same as the version of the document posted on the TNRCC web page, which calls into question whether any changes to the section should be allowed, and whether other inconsistencies may be present.

The commission responds that the web page version was posted in advance of the official publication. The commission’s intent in providing the early draft version to the regulated community was to provide both advance notice and to maximize the comment period. The web page link clearly stated that the proposal was “DRAFT.” The official proposal for comment is the *Texas Register* version.

SPECIFIC COMMENTS

§290.38. Definitions

HAPJAC commented that the definition of ABPA (American Backflow Prevention Association) in §290.38(1) should remain in the rules, and that it should be expanded to describe APBA as an organization accredited to provide profession Backflow Prevention Assembly Tester (BPAT) certification and approved 40-hour backflow prevention assembly testing course.

The commission disagrees with this comment. Since the term APBA has been removed from the rules, it should not be in the definitions. The TNRCC Compliance Support Division, Operator Certification Section determines who can provide backflow prevention assembly testing certification.

HAPJAC commented that the definition of ASSE (American Society of Sanitary Engineers) in §290.38(5) should remain in the rule, that the address should be corrected, and that the definition should explicitly state that programs that meet ASSE Series 5000 standards are accredited to provide professional backflow prevention assembly testing certification and to provide approved backflow prevention assembly testing training.

The commission disagrees with this comment. Since the rules do not use any ASSE standards and make no references to the ASSE, the term ASSE is not included in the definitions. The TNRCC Compliance Support Division, Operator Certification Section provides requirements for backflow prevention assembly testing certification.

§290.39. General Provisions

COAu requested clarification on whether §290.39(j)(4) refers to additional pumping capacity or to additional connections. Specifically, the commenter asks if they are required to notify TNRCC every time they sell 250 new taps. In addition, they request clarification of whether the distribution capacity is calculated based on the number of connections, pumping capacity, or some other parameter.

The commission responds that this paragraph requires that whenever a public water system either sells 250 new taps, or if the system makes an addition of 10% of the system's distribution capacity, for instance, ten taps to a system with 100 connections, the system must notify the executive director. These two conditions refer to the number of connections. Additionally, if a system makes a change to the distribution system that will result in their failure to comply with the capacity requirements of §290.45, the system must notify the executive director.

§290.41. Water Sources

Eco/District commented that, while §290.41(c)(1)(F) is not changed under the current rule proposal, the commenter wishes to note some problems with it. The commenter states that the commission has recently interpreted that this requirement for a sanitary easement is not met by simple ownership by the utility of the land within a 150-foot radius of a well, because the utility can not legally grant an easement to themselves. The commenter suggests that it is in the best interest of the utility to protect the water in a well they own, and that owning the land around the well seems to meet that goal better than any form of easement. The commenter requested that language be added to §290.41(c)(1) which would allow ownership by the utility to meet the requirement for an easement, as long as the other applicable parts of the rules are met.

The commission recognizes the concern with the legal definition of “sanitary easement.” The commission’s intent with this provision was to ensure that the area around a well would not be used for activities that could contaminate the drinking water source. Case law provides that if the same entity owns both the utility and the land, that entity cannot grant himself/herself an easement. The commission is working on a solution to this issue and plans to address this issue in the next changes to Chapter 290, anticipated to be within the next two years.

TCC suggested that in §290.41(e)(1)(F) fecal coliform be replaced with *Escherichia coli* as one of the parameters considered when evaluating source water quality prior to using that source. The commenter notes that this change would correspond with the parameters proposed as part of the Texas water quality standards for identification of human contamination.

The commission agrees with this comment and has made this change.

COAu requested an explanation of how TNRCC will use the information that §290.41(e)(1)(F) requires regarding water quality parameters for a new water source.

The commission will use the information about the source water proposed for development to determine the appropriateness of the proposed treatment technology.

§290.42. *Water Treatment*

COAu requested that §290.42(d)(6)(A) be expanded to state the possibility that the executive director may approve keeping less than a 15-day supply of chemical storage for large-volume chemicals, such as lime for softening.

The commission retains the ability to grant exemptions to the requirements for chemical storage capacity, or any of the provisions in §290.42, on a case-by-case basis in §290.39(l). If we were to include a statement under the provision for chemical storage, it could easily be interpreted to mean that other provisions under §290.42 were not eligible for exceptions. Exceptions to the rule are granted only if the exception will not compromise public health or result in a degradation of service or water quality.

COAu recommended that TNRCC include additional language in §290.42(d)(10)(C) to allow a facility to use existing data when re-rating a treatment plant. Specifically, the commenter recommends that the following text be added to this paragraph: “Where shorter detention times are desired, engineering data, pilot plant test data, full-scale installation data and other information as required by the Commission shall be submitted to the executive director for review and approval.”

The commission retains the ability to grant exemptions to the requirements for sedimentation basin capacity, or any of the provisions in §290.42, on a case-by-case basis in §290.39(l). If the commission were to include a statement under the provision for sedimentation basin capacity, it could easily be interpreted to mean that other provisions under §290.42 were not eligible for exceptions. Exceptions to the rules are granted only if the exception will not compromise public health or result in a degradation of service or water quality.

COAu commented that good science does not support allowing filtration facilities to be designed with the design flow based on all filters in operation, even if the system has other sources of potable water, and that the exemption provided in §290.42(d)(11)(B) should be removed. The commenter noted that although a system may have other potable water sources for normal operation, filtration facilities must be expected to treat the maximum flow while one filter is off line for backwashing. The alternative would be either to fail to backwash during high flow period, to change overall plant flow during backwash, or to coordinate with other potable water sources during backwash. None of these alternatives are acceptable. Failure to backwash could result in filter runs extending into turbidity breakthrough. Changing overall plant flow during backwash, except in highly automated plants, would likely cause chemical feed upset. Coordination with other sources of potable water would be operationally difficult. The commenter recommended that the exemption be removed.

The commission agrees with this comment. Proper design of filtration facilities should be based on peak flow with the largest filter out of service. As a result of this comment, the adopted new rule was reorganized to group all of the provisions related to design capacity of the filtration facilities in a single paragraph and eliminate the reference to other production facilities.

TCC commented that the regulations for piping color codes applicable to stand-alone facilities in §290.42(d)(13)(A) and (B), should be rewritten to allow facilities that primarily use chemicals for purposes other than potable water treatment to maintain a piping color code consistent with the overall facility requirements. Specifically, TCC recommends that the requirement that piping repainted after October 1, 2000, be painted in the approved colors be amended to apply only to facilities that are stand-alone water treatment facilities.

The commission agrees, in part, with this comment. It is intended that all facilities that are primarily engaged in the production of potable water have the same color code to reduce the possibility of operator error. However, the commission agrees that in industrial facilities there may be a need to retain certain pipe colors for congruence between process and potable treatment pipes. These plants may seek an exception to the rule under the provisions of §290.39(l).

§290.44. Water Distribution

COAu, SS, and COC commented on the types of backflow prevention assemblies that should be required to have annual testing under §290.44(h)(4)(A). COAu recommended that TNRCC require annual testing of all backflow prevention assemblies, regardless of whether they are located on a non-health hazard line or on a health-hazard line. COAu noted that national backflow prevention standards (i.e. Uniform Plumbing Code, National Standard Plumbing Code, Southern Standard Plumbing Code and the University of Southern California's Foundation for Cross-Connection Control and Hydraulic Research, Manual for Cross Connection Control, 9th Edition) recommend annual testing of all backflow prevention assemblies. COAu commented that potable water lines should be protected from both health hazards and non-health hazards, and that annual testing would contribute to this protection. SS commented that the rule should clarify that each detector assembly must be tested. COC expressed concern that elimination of the classifications for health hazard and non-health hazards would impose a financial hardship on distribution systems. This concern was based on the perception that elimination of these classifications would mean that all backflow prevention devices would have to be tested annually. COC suggested that the commission let utilities determine which backflow prevention assemblies should be tested annually.

The commission responds that the current rules were not promulgated with the intent to address non-health hazard installations. Local entities retain the authority to determine whether annual testing of non-health hazard assemblies is appropriate for their system and to require that these be tested. The current changes to the rules regarding backflow prevention were predicated by an instance where a utility interpreted the previous rule language in a manner that created a hardship to its customers; for that reason, §290.47(i) has been added to specify conditions that represented health hazards and non-health hazards. The specific testing requirements of §290.44(h)(A) apply only to the health hazards identified in §290.47(i) and are only minimum compliance requirements; they may not describe all hazards that must be controlled or isolated from the public water system under the provisions of the local plumbing codes or restrictions. Although public water systems are to be commended for increasing the vigilance with which they protect the public health, the commission’s regulations only require annual testing of backflow prevention assemblies which are needed to protect the system from the health hazards identified in §290.47(i) and do not address those devices installed at connections which are considered to be non-health hazards.

COCS commented that §290.44(h)(1)(B)(ii) states that copies of backflow prevention device test reports must be filed by the public water system, but §290.44(h)(4)(C) states that the original must be “submitted to the public water system for record keeping purposes.” Currently the original form is kept by the water system. The commenter recommends that the rule be consistent.

The commission responds that the rules are consistent. In §290.44(h)(1)(B)(ii), the rules require that the water system must obtain a copy of the test report. In §290.44(h)(4)(C), the rules require that the tester must give the original copy of the test report to the water purveyor.

TDI, COCS, COC, and BFU commented on the language in §290.44(h)(4)(A) differentiating between backflow prevention assembly testers who are allowed to work on firelines, as compared with those who are not. TDI requested that the rules be amended to clarify the requirement that only certified backflow prevention device testers who service firelines comply with the applicable codes.

Specifically, the commenter requested that the following language be added to the rule: “The inspection, servicing, or testing of a backflow preventer, which is part of a fire sprinkler system, may require the individual to comply with the Texas fire sprinkler licensing laws, according to the Texas Insurance Code, Article 5.43-3 et seq. as administered through the Texas State Fire Marshal’s Office.”

COCS commented that §290.44(h)(4)(A) eliminating the distinction between general testers and fireline testers needs to be clarified to make explicit the requirements regarding certification for backflow prevention device testers. COC commented that the language regarding fireline and general tester classifications in §290.46(h)(4) should remain as it is in the existing rules. COCS stated that the change standardizes all testers into one classification. Specifically, the commenter suggests that “§290.46(j)(I)(a)(i) should remain the same as in current rules,” and “§290.46(j)(I)(a)(ii) should be changed to expand and clarify the requirements for fireline testers.” BFU commented that removal of the language regarding fireline testing will cause undue confusion and may result in unqualified personnel performing backflow device testing on firelines.

The commission does not agree that the prior language should be reinstated. The commission does agree that the proposed language should be modified to provide further clarification, especially in regard to fireline testing. New text for §290.44(h)(4)(A)(i) and (ii) is contained in the adopted rules to provide clarification. The text of §290.44(h)(4)(A)(ii) has been changed to read “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 Marshall’s office requires that any person performing maintenance on firelines must be employed by an Approved Fireline Contractor.”

COAu recommended that TNRCC retain the references to state licensing laws in §290.44(h)(4). The commenter expressed concern that removing these references would make it appear that the regulated community was not required to follow these other rules.

The commission disagrees because the references are not mentioned in the original §290.44(h) or §290.46(j), and the regulated community has been aware that they must comply with all applicable regulations, in addition to those contained in Chapter 290.

COAu recommended that TNRCC create classifications of backflow testers under §290.44(h)(4)(A) which would assist the testers to comply with other state agencies’ regulations. The commenter states that the classification and limitation of backflow prevention assembly testers is imperative to the success of the backflow tester and the water supplier in developing an enforceable cross-connection control program.

The commission responds that operator certification and testing are administered by TNRCC Compliance Support Division under §290.46(e). TNRCC will provide this comment and information to that section for their consideration in the certification of backflow assembly testers.

COAu, COC, and SS commented on the types of backflow prevention assemblies that should be required to have annual testing under §290.44(h)(4)(A). COAu recommended that TNRCC require annual testing of all backflow prevention assemblies, regardless of whether they are located on a non-health hazard line or on a health hazard line. COAu noted that national backflow prevention standards (i.e., Uniform Plumbing Code, National Standard Plumbing Code, Southern Standard Plumbing Code and the University of Southern California's Foundation for Cross-Connection Control and Hydraulic Research, Manual for Cross Connection Control, 9th Edition) recommend annual testing of all backflow prevention assemblies. COAu commented that potable water lines should be protected from both health hazards and non-health hazards, and that annual testing would contribute to this protection. COC expressed concern that elimination of the classifications for health hazard and non-health hazards would impose a financial hardship and political upheaval of distribution systems; this concern was based on the perception that elimination of these classifications would mean that all backflow prevention devices would have to be tested annually. COC suggested that the commission let utilities determine which backflow prevention assemblies should be tested annually. SS commented that the rule should clarify that each detector assembly must be tested.

The commission disagrees. The current rules were not promulgated with the intent to address non-health hazard installations. However, local entities retain the authority to determine whether annual testing of non-health hazard assemblies is appropriate for their system and to require that

these be tested. Although public water systems are to be commended for increasing the vigilance with which they protect the public health, the commission's regulations only require annual testing of backflow prevention assemblies that are needed to protect the system from the health hazards identified in §290.47(i) and do not address those devices installed at connections that are considered to be non-health hazards. The current changes to the rules regarding backflow prevention were predicated by an instance where a utility interpreted the previous rule language in a manner that created a hardship to its customers. For that reason, §290.47(i) has been added to specify conditions that represented health hazards and non-health hazards.

HAPJAC commented that the word "approved" should be added before the words "backflow prevention assembly" in §290.44(h)(1)(A) to make it more clear that only assemblies that have been manufactured and tested according to industry standards may be used in water distribution systems.

The commission disagrees with this comment and has decided not to modify the language.

HAPJAC commented that approved course and current professional certification should be defined in the rule and that current backflow prevention course providers and professional organizations that provide certification should be listed and approved in the adopted rule under §290.44(h)(4)(A).

Specifically, the commenter suggests that the American Society for Sanitary Engineering (ASSE) Series 5000 Professional Qualification Standards for Backflow Prevention Assemblies Testers, Repairers and Surveyors, the American Backflow Prevention Association (APBA) and Texas A & M University should be recognized as accredited in the rule. The commenter recommends that approval by TNRCC

should not be the basis for course approval, rather, courses should be considered approved if the course providers meets ASSE or ABPA standards.

The commission responds that requirements for backflow assembly tester certification are addressed in §290.46(e), which is administered by the TNRCC Compliance Support Division, Operator Certification Section. TNRCC will provide this comment and information to that section for their consideration in the certification of backflow assembly testers.

HAPJAC commented that the rule should recognize organizations that write procedures for gauge testing and recognize manufacturers written gauge calibration procedures in §290.44(h)(4)(B).

The commission disagrees with this comment. The regulations require that all gauges must be tested 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). These manuals are widely recognized as the standard in the industry, provide thorough and easily readable procedures, including clear illustrations, and are widely available to gauge testers.

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

COAu requested clarification of the frequency with which the residual disinfectant must be measured in finished water storage tanks in §290.46(d)(2). In addition, the commenter requested clarification of the consequences of a case in which the water in the top of a storage tank failed to carry a residual although the water in the bottom of the tank contained an acceptable concentration of a disinfectant.

The commission requires the residual disinfectant in a storage tank to be measured upon the request of TNRCC staff. If a sample taken at the request of TNRCC staff contained no disinfectant residual, regardless of the sampling location in the tank, the system would be considered in violation of the requirement that they retain a disinfectant residual in storage tanks.

Eco/Donna noted that if different turbidity standards are approved for different sized systems, then different certification levels for operators should be required at these different sized systems under §290.46(e).

The commission responds that the adopted rules require all systems to meet the same combined filter effluent turbidity requirements. The commission recommends that the commenter address concerns with respect to operator certification to the TNRCC's operator certification program.

TCC requested that §290.46(f)(3) be amended to make more clear which public water systems must comply with the record keeping requirements.

The commission responds that the language has been changed from "The public water system..." to "All public water systems..." in order to make it clear that all public water systems must keep records of their operation.

Eco/District and TXU commented on the interpretation of daily reporting requirements in §290.46(f)(3)(A). Eco/District requests clarification of the daily reporting requirements for public water systems. This commenter interprets the statement that public water systems must maintain a

daily record of operations to mean that systems that have no daily reporting requirements must visit the plant daily, and requests further elucidation of the intent of this provision. TXU commented that, while there is merit in maintaining daily records of chemical use and water volumes treated for large community systems, there is not a need for daily record keeping for small noncommunity systems. The commenter suggested that it would be less onerous and more feasible to require weekly record keeping for small noncommunity systems.

The commission notes that the rules have not been changed, the daily record keeping requirement has not changed from previously existing requirements in the adopted rules. Nevertheless, the commission recognizes that this comment has merit. However, before making a change to this regulation, the TNRCC would like to receive guidance from the regulated community on what systems could reasonably be required to keep records of chemical use and flow rate on a weekly basis based on the size of the system. Consequently, the staff of the public drinking water program will discuss this issue with the Drinking Water Advisory Workgroup. In addition, the EPA is in the process of promulgating Stage 1 of the Long-Term Enhanced Surface Water Treatment Rule. The commission will address this comment in approximately six months when it begins developing the implementation strategy for the upcoming federal rule.

TCC requested that §290.46(f)(3)(B)(v) be amended to clarify the specific records that constitute records of backflow device programs.

The commission responds that all the record storage requirements for public water systems are contained in §290.46(f)(3) of the adopted rules, including the record retention requirements for

backflow device programs. No change is intended to the requirement that records of backflow prevention assembly testing be retained for at least three years and that records of customer service inspections be retained for at least ten years.

TCC recommended that the TNRCC review the data retention requirements of §290.46(f)(3)(E) and reduce the amount of retained information to the minimum to demonstrate compliance. The commenter stated that the specific need to retain some of the data for an extended time is not clear.

The commission responds that many of the records retention periods are specified by federal regulations and that the data retention requirements for other records were negotiated with a stakeholder group that included representatives of Texas Municipal League; Texas AIDS Network; Texas League of Women Voters; Texas Rural Water Association; Texas Water Utilities Association; Texas Section of the American Water Works Association; Clean Water Action; TNRCC Field Operations staff; representatives from small utilities, medium sized utilities, large utilities, utilities treating groundwater, and utilities treating surface water; during four eight-hour meetings in the summer of 1999. The commission believes that the data retention requirements are consistent with the minimum amount of time necessary to demonstrate compliance.

TCC requested that the phrase “other pertinent data” in §290.46(f)(3)(E)(v) be replaced with a specific listing of records the TNRCC requires to be kept, and states that the interpretation of this phrase could change over time, such that what is deemed pertinent now might not include records the agency deems pertinent in the future.

The commission agrees that the proposed language did not provide sufficient guidance regarding the additional records that might be required by the executive director. Furthermore, the staff determined that the “other pertinent data” that might be required might not need to be retained for ten years. Consequently, the adopted new rules clarify what additional records might be required on a case-by-case basis and allows the executive director to establish retention periods for data not addressed in paragraphs (A) through (E).

Eco/District requested that the deadline for submittal of MORs in §290.46(f)(4)(A) be extended from ten days to either ten working days or to 15 calendar days.

The commission responds that the requirement for submitting MORs by the tenth of the month is a specific requirement of the Surface Water Treatment Rule (54 Fed Reg 27535, June 29, 1989).

TCC requested that the effective date of the requirement that systems submit any monthly or quarterly reports required by the executive director in §290.46(f)(4)(A) be delayed until December 17, 2001, and cited this date as the date required by EPA.

The commission responds that no change was intended to this requirement that systems submit any reports required by the TNRCC, or is made from the requirement previously contained in §290.46(d). There is no new applicability deadline.

TXU requested that sodium hypochlorite be allowed as a emergency distribution system disinfectant, as well as calcium hypochlorite in §290.46(h).

The commission responds that, because calcium hypochlorite is a solid, it is possible to deliver the high doses needed in the event of emergency distribution system line breaks. Because sodium hypochlorite is a liquid, it is not always possible to deliver the required concentration of free chlorine to the contaminated area. Therefore, the commission continues to require that a supply of calcium hypochlorite be kept on hand in the event of a line break.

TXU commented that noncommunity systems, such as industrial facilities, have no mechanism for creation of plumbing ordinances, regulations, or service agreement, as required in §290.46(i). The commenter noted that proper cross-connection control is achieved through procedures and postings, as appropriate, for these systems. TXU recommended that transient and nontransient noncommunity water systems that do not possess governmental or contractual authority should be exempted from this requirement.

The commission disagrees with this comment. The employees of an industrial nontransient facility or the customers of a transient facility deserve the same public health protection at work and while in transient facilities that they receive from their community water system at home. The facility can modify their procedures, with approval, but their procedures must be protective of public health. The commission decided not to provide an exemption.

COC commented that, in §290.46(j), the language regarding “health hazard” and “high health hazard” should not be changed as proposed, but that the definitions should remain as they are. The commenter stated that utilities should be allowed to determine whether a hazard is high or not.

The commission disagrees with the commenter. The changed terminology in the definitions in the adopted rules are consistent with widely accepted and used industry terminology and the revision was needed to clarify the specific minimum requirements of the regulation.

TXU commented that noncommunity systems such as industrial facilities, do not sell water to customers and that they own the facility that is being provided with water. The commenter noted that proper cross-connection control is achieved through procedures and postings, as appropriate, for these systems. The commenter recommended that transient and nontransient noncommunity water systems which do not possess governmental or contractual authority should be exempted from the requirement contained in §290.46(j).

The commission disagrees with the comment. The language in §290.46(j) requires that a customer service inspection report be completed if water is provided to new customers or construction, if a contamination hazard is identified, or if there are additions to a private water distribution facility. While the commission agrees that an industrial facility may be unlikely to add new customers, the facility should still utilize a systematic method of identifying and correcting potential contamination hazards. As noted in §290.46(j), the commission does not object if the public water system modifies the customer inspection form contained in §290.47(d) to address site-specific requisites provided that the executive director has reviewed and approved the alternate format.

COAu commented that the requirement in §290.46(m)(5) that settling basins be kept free of an excessive buildup of solids should not be considered a maintenance issue, based on interpretation of this section as addressing “maintenance/housekeeping” issues.

The commission disagrees with the recommendation to move or remove the requirement that settling basins be kept free from an excessive build-up of solids. The purpose of §290.46(m)(5) is to require systems to explicitly address maintenance issues as part of operational requirements, not merely to require good housekeeping. Excessive buildup of solids in a settling basin can severely limit the ability of the settling basins to remove pathogens from the water. Removal of excessive build-up of solids from settling basins is a periodic activity performed by the operations staff, and as such, is properly located in this section.

COP is opposed to the requirement in §290.46(n) that systems retain engineering plans. For wells drilled ten to 15 years ago, the city has no engineering plans except possibly drilling logs.

The commission responds that the adopted rules require that a public water system retain the well logs and completion reports for active wells but does not require the retention of engineering plans for all wells. The requirement that a system maintain a record of the engineering drawings applies only to treatment facilities, pump stations, and storage tanks.

COAu commented that if a surface water treatment plant must backwash a filter at 1.0 NTU, as specified in §290.46(o), this requirement could eliminate the requirement for an exception report on an individual filter, as required for plants treating surface water or groundwater under the direct influence of surface water and serving 10,000 people or more specified in §290.111(e)(3) of the adopted rules.

The commission responds that the provisions of §290.46(o) address an operational constraint imposed by the requirements of §290.111. The commission agrees that a system that continuously

complies with the requirements of §290.46 should never need to submit an exceptions report required by §290.111(e)(3). However, §290.111(e)(3) currently applies only to systems serving at least 10,000 people and does not establish operating constraints for small systems. Backwashing of filters is a periodic activity performed by the operations staff, and is properly located in this section. The backwash criteria established by the section is consistent with good operating practices.

COAu commented that the notice to boil water required by §290.46(q)(3) should be issued when the turbidity of the water entering the distribution system exceeds 1.0 NTU, rather than 5.0 NTU. In addition, the commenter recommends that the notice remain in effect until the water entering the distribution system has a turbidity of 0.5 NTU or less.

The commission disagrees with the commenter and responds that a notice to boil water is absolutely required when the turbidity of the water entering distribution system exceeds 5.0 NTU. In addition, the adopted regulation allows the executive director to require a public water system to institute a variety of protective measures with the intent to protect public health. Finally, the adopted rule does not restrict a public water system from initiating an advisory to boil water at turbidity levels lower than the 5.0 NTU limit or retaining the notice after the turbidity level drops below 5.0 NTU.

TXU commented that it is not possible to calibrate some flow measurement devices as required by §290.46(s)(1) except by isolation of the well and meter for a qualitative check of the volume pumped.

The commission disagrees with this comment. The commission readily acknowledges that the physical measurement of the amount of water pumped is a very effective method to calibrate a flow meter. However, this test will only be acceptable if the test utilizes a quantitative, not qualitative, methodology.

COP estimated that the proposed changes in testing and calibration contained in §290.46(s)(2) will have a financial impact of \$25,000 on their annual budget, and commented that this was a burdensome fiscal impact.

The commission responds that no change is intended or made to the current requirements for calibration of pH meters, turbidimeters, and chlorine residual analyzers. The requirements in the adopted rules were previously contained in regulatory guidance (Monthly Reporting Requirements for Surface Water Treatment Plants, RG211). The purpose in requiring systems to calibrate equipment used to measure turbidity, disinfectant residuals, and pH, is to make certain the data obtained is accurate. Required measurements made with these devices ensure that the water provided to customers is protective of public health. The adopted rules add the requirement that flow measuring devices and flow rate controllers be calibrated annually. Further, the commission disagrees with the likely magnitude of fiscal impact. The requirement in the adopted rules that systems calibrate flow measuring devices annually is expected to have a fiscal impact of approximately \$200 to \$300 per meter per year. Calibration of flow measuring devices ensures that a system feeds chemicals correctly and determines system water losses accurately.

COAu questioned how a “series of samples” would be defined under §290.46(s)(2)(A), with respect to the requirement that pH meters be checked with at least one buffer each time a series of samples is run.

The commission responds that a series of samples is defined as the group of samples that an operator runs in a continuous sequence. For example: if an operator analyzes a group of samples, leaves the laboratory for lunch, and returns an hour later, calibration of the pH meter must be checked before proceeding with additional measurements. If, however, the operator leaves for only a moment, the series could reasonably be considered as one group. Although the adopted rules established minimum acceptable operating practices for public water systems, they do not prohibit a laboratory from implementing more rigorous quality control and assurance procedures.

COAu recommended that calibration requirements for on-line pH meters be included in the rules under §290.46(s)(2).

The commission agrees with the comment and the rule language has been revised to address both bench top and on-line pH analyzers.

COAu questioned whether TNRCC would accept Hach ICP/PIC Calibration/Verification Modules for on-line Hach 1720C or D Turbidimeters as a substitute for comparing the results of the on-line unit with a bench top unit as required by §290.46(s)(2)(B).

The commission responds that the Hach ICP/PIC Calibration/Verification Modules may be used to check on-line turbidimeters, but not for primary calibration. Consequently, the adopted new rules allow public water systems to confirm the calibration using a primary standard, a secondary standard, a proprietary calibration-verification device or the comparison method.

COAu questioned how a “series of samples” would be defined in §290.46(s)(2)(B)(ii), with respect to the requirement that bench top turbidimeters be checked with secondary standards each time a series of samples is tested and, if necessary, recalibrated with primary standards.

The commission responds that a series of samples is defined as the group of samples an operator runs in a continuous sequence. If an operator has a group of samples, analyzes some portion of them, leaves the laboratory for lunch, and returns, the turbidimeter calibration should be verified before proceeding with additional measurements. If however, the operator leaves for only a moment, the series could reasonably be considered as one group. Although the adopted rules established minimum acceptable operating practices for public water systems, they do not prohibit a laboratory from implementing more rigorous quality control and assurance procedures.

TXU commented that an exemption from the calibration requirements of §290.46(s)(2)(C)(ii) and (iii) should be included for continuous residual monitors that are used for process control and not for reporting purposes.

The commission responds that it was not intended that process control meters be included in the requirement. The language has been changed to clarify that only those meters which are used to

obtain data required for compliance with these regulations must be calibrated in the manner designated.

§290.47. Appendices

COC commented that on the customer service inspection form in §290.47(d), the requirement that water service shall not be provided to the private distribution facilities until certain conditions are met should remain in the rules. The commenter stated that this provision gives the utility the ability to control who will receive service and that removing the language makes it impossible to deny service to inappropriate connections.

The commission notes that the wording referenced by the commenter was removed from the form because it provided the basis for customer abuse and harassment by a small number of public water suppliers. In addition, independent customer service inspectors lack the authority to terminate service. This power resides with the water supplier. Instead, §290.46(j)(2) has been modified to clarify when service can be terminated and restored.

COC commented that on the backflow prevention assembly test form, §290.47(f), a line should be added for the tested pressure under the “2nd Check” column, as is included under the “1st Check” column.

The commission agrees that this information may be useful and has revised the form accordingly.

COCS commented that there should be a place on the new form contained in §290.47(f), for gauge certification information required by §290.44(h)(4)(B), method of installation (vertical or horizontal), and the reason for installation (i.e. domestic use, fireline, irrigation use, etc.).

The commission agrees with this comment and has amended the form to include a line for the tester to respond to the question “Is the assembly installed in accordance with manufacturer recommendations and/or local codes?”

COC recommended that on the backflow prevention assembly form in §290.47(f), a question be added addressing spill resistance or reduced pressure.

The commission agrees that this is a concern and has added a general question on the form concerning compliance with manufacturers installation recommendations and/or local codes.

SS commented that TNRCC should allow electronic storage and transfer of the backflow prevention assembly test form.

The commission responds that the rules do not prohibit electronic storage or providing additional information on the form. The commission notes that any form which varies from that included in the rules must have agency approval. This includes test reports in electronic format. Submission or electronic transfer of an electronic form with a format that is identical to that of the form shown in §290.47(f) is not necessary or required.

SS commented that the “time in” and “time out” should be included on the backflow prevention assembly form in §290.47(f).

The commission disagrees with the comment, but notes that the commenter may use a form other than that provided in §290.47(f), if the commenter requests and obtains commission approval under the provisions of §290.44(h)(4)(C).

SS commented that on the changes to the form contained in §290.47(f), the commission should remove “atmospheric vacuum breaker” as one of the “types of assembly,” and that “atmospheric vacuum breaker” should be replaced with “spill resistant breaker.”

The commission agrees that it is appropriate to list spill resistant vacuum breakers as well as detector assemblies in the form contained in §290.47(f) because they are considered acceptable backflow prevention assemblies and are required to be tested. The form has been revised to include spill resistant pressure vacuum breakers, double check detector, and reduced pressure principle detector assemblies.

SS commented that on the form contained in §290.47(f), the certified tester should be allowed to use their certification number rather than their social security number.

The commission notes that the form requires the tester to provide their certified tester number, not a social security number, when completing the report.

SS commented that on the form contained in §290.47(f), a line should be added next to “initial test” to show whether the assembly passed or failed.

The commission disagrees with the comment because pass/fail information is superfluous because the assembly must be repaired if it fails the initial test. The form is a certification that the assembly is operating within acceptable parameters.

SS commented that on the form contained in §290.47(f), just below the “remarks” section, the section that reads “The above is certified to be true.” should be revised to read “The above is certified to be true at the time of testing only.” The reason for this is to limit the liability of the tester.

The commission agrees that there is justification for this suggestion and the language has been changed.

Two commenters opposed inclusion of the table of assessments and hazards contained in §290.47(i). COAu commented that the table of assessments of hazards and selection of assemblies was obtained from AWWA Manual M-14, copyrighted in 1966 and reprinted in 1990. The commenter opined that the manual is 34 years old and outdated. Additionally, COAu noted that the table is not consistent with the national backflow prevention standards (i.e. Uniform Plumbing Code, National Standard Plumbing Code, Southern Standard Plumbing Code and the University of Southern California’s Foundation for Cross Connection Control and Hydraulic Research, Manual for Cross-Connection Control, 9th Edition). In addition, COAu stated that the application and designation of hazards in the list is not consistent with the state adopted plumbing codes. COAu therefore expressed concern that adoption of

the table would put water suppliers in the position of trying to comply with competing state regulations: those legislated in the state plumbing licensing law, and those in Chapter 290. The commenter suggested that if TNRCC chooses to include a table of this type, the table be obtained from the proposed update to AWWA Manual M-14, which incorporates the national updates and is a recommended practice manual. COC commented that in the appendix §290.47(i), Assessment of Hazards and Selection of Assemblies, inclusion of this table pigeonholes potential hazards. The commenter stated that the utilities will be too limited by this list of hazards. In addition, the commenter stated that smaller systems will think they are in compliance if they don't have any of the hazards listed on the form, but they may be at risk from some hazard that is not listed in the table.

The commission responds that the Table of Assessments was developed using references from the AWWA M14 Manual, the University of Southern California's Manual of Cross-Connection Control, and staff input. The commission realizes that the table is not an all-inclusive list and has incorporated an introductory paragraph at the top of the list. The paragraph states "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." The commission also acknowledges that the list is not intended to be a surrogate for local, comprehensive plumbing regulations and ordinances required by adopted new §290.46(i). However, the list defines conditions under which a public water system is required to comply with the provisions of new §290.44(h) and provides guidance to assist the regulated community in determining types of hazards and backflow prevention assemblies that might be appropriate under other conditions. The commission reclassified some items as health hazards rather than non-health hazards after reviewing data in the AWWA

Manual and USC Cross-Connection Control Manual. The commission added watering troughs to the list of health hazards requiring internal protection.

BFU commented that the difference between reclaim water and recycle water (treated effluent) on the Table of Assessments located in §290.47(i) should be made clear.

The commission responds that from the perspective of backflow prevention, there is little difference between reclaim water and recycle water. Neither are suitable for distribution as public drinking water without extensive treatment, and without an internal protection provided in accordance with the requirements of §290.44(h) and §290.47(i) an appropriate backflow prevention device must be installed at the service connection.

BFU commented that steam plants should be classified as a health hazard on the table in §290.47(i).

The commission agrees. Steam plants will be classified as health hazards in the adopted rule.

BFU commented that ornamental fountains should be classified as a health hazard and that the DCVA should be eliminated, allowing only AVB-PVB-R/P-A/G on the table in §290.47(i).

The commission agrees that ornamental fountains should be classified as a health hazard because the anti-algal, anti-fungal, and colorant compounds that may be added to the water could cause a public health risk if cross-connection occurred. The commission also changed DCVA to AVB - PVB in the adopted rule.

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

Requirements for Public Water Supply Systems

Four commenters (Eco/District, TCC, NETMWD, and COP) requested clarification of how purchased water systems and wholesalers would be considered with respect to the sampling requirements of this subsection. Eco/District commented that the rules appear to ignore systems which use only purchased water or these are being required to do an unreasonable amount of sampling. The commenter requested clarification on the testing required of wholesalers and purchasers. Eco/District also commented that the rules do not make it clear whether systems that use only purchased water are required to comply with the new requirements regarding TTHM and HAA5. TCC requested guidance from TNRCC on how a nontransient noncommunity water system utilizing purchased water will address excessive disinfection by-products (TTHM and HAA5) in their water. NETMWD commented that it will be impossible for water wholesalers to control the water quality in the distribution systems of their purchasers. COP commented that since all the surface water used by their city will be purchased from other public water systems, it seems that there is a large amount of unnecessary costly duplication.

The commission responds that systems purchasing surface water completely treated by another public water system are not required to meet the requirements of the rules that apply to systems which treat surface water. The requirements of the rule that apply to systems which purchase treated water are intended to ensure public health protection within that system's distribution system. Previous federal rules have based sampling requirements on the number of connections that a system serves. Now, however, EPA is basing sampling requirements on the number of individuals that a system serves. Obviously, changes will be necessary to the sampling plans of

some systems. Nevertheless, the commission recognizes that with respect to distribution system samples, such as TTHM and HAA5, a system that rechlorinates treated water is at least partially in control of these disinfection by-products. As implementation of these rules progresses, the commission will gain knowledge of the relationships between various systems, and will make every effort to apply the sampling requirements in an equitable manner. It is important for systems which are participants in contracts involving the sale or purchase of water, to look to the future and work together to ensure that their shared distribution systems are sampled appropriately.

§290.102. General Applicability

UTBWQC commented that the TNRCC should explicitly include provisions for granting extensions of up to two years for systems to comply with new MCLs or treatment technique requirements for systems that must make capital improvements to comply with the rules. The commenter correctly notes that this authority is granted to the state in §1412(b)(10) of the Safe Drinking Water Act (42 USC §300g-1(b)(10)). Specifically, UTBWQC recommends that the following language be included as §290.102(d): “The executive director may grant an extension of up to two years to a compliance date for a MCL or treatment technique if the executive director determines that additional time is necessary for capital improvements. Applications for extensions must be submitted to the executive director in writing by the owner of the water system. The request must include a statement of the compliance date for which an extension is needed; a description of the capital improvements necessary to meet the MCL or treatment technique and the efforts made by the system to construct the needed facilities; and a schedule for completing the capital improvements. The executive director shall extend the compliance deadline (to the date included in the application) for a public water system if the executive director determines that the system is diligently working to comply.”

The commission believes this comment is meritorious. However, before adopting this provision which is a significant change to the proposed rules, the commission plans to receive guidance from the regulated community and various consumer groups on the scope and applicability of this provision, as well as provide an opportunity for all affected persons to comment. Consequently, the commission's staff will discuss this issue with the Drinking Water Advisory Work Group and will seek public comment on the proposal the next time that Chapter 290 is opened for comments. Since the EPA is in the process of promulgating Stage 1 of the Long-Term Enhanced Surface Water Treatment Rule, the commission expects this chapter of the rules to be reopened in approximately six months.

TCC commented that §290.102(b)(3)(C) states that a long range plan must be submitted within one year of notification that a variance or exemption has been granted, but §290.102(b)(3) states that the long range plan must be submitted with the application. TCC recommends that the phrase "The request must include the following:..." in §290.102(b)(3) be changed to "The request must include, or a schedule to submit, the following:..."

The commission responds that the intent of the provision is to ensure that sufficient planning takes place before the system makes changes. The commission has revised the language to clarify that the plans submitted with the initial request should be general, and that a more specific plan including details of the system's actions should be submitted after the variance or exemption is granted.

§290.103 Definitions

COAu commented that the definition of “enhanced coagulation” in §290.103(6) is not clear. The commenter recommended that based on discussion between the regulated community and the EPA during the regulatory negotiation process, the definition should read: “Enhanced coagulation - the removal of disinfection by-product precursors to a specified level by conventional coagulation and sedimentation.”

The commission agrees with this comment and has revised the rule to the language recommended in this comment.

COAu commented that the definition of “enhanced softening” in §290.103(7) is not clear. The commenter recommended that, based on discussion between the regulated community and the EPA during the regulatory negotiation process, the definition should read: “Enhanced softening - the removal of disinfection by-product precursors to a specified level by softening.”

The commission agrees with this comment and has revised the rule to the language recommended in this comment.

COAu commented that the definition of “maximum contaminant level” in §290.103(13) is not clear. The commenter also suggested that the second and third sentences describing acute and nonacute health effects be removed.

The commission agrees with this comment and has revised the rule language.

TCC commented that the sentence, “There is convincing evidence that addition of a disinfectant is necessary for control of waterborne diseases,” in the definition of “maximum residual disinfectant level” in §290.103(14) is confusing and recommends that it be struck.

The commission responds that inclusion of this sentence is motivated by the need to make it extremely clear to persons using disinfectants that although there is a maximum regulatory limit, it is not desirable to reduce the concentration to zero. For other chemicals (e.g. SOCs) that have a maximum limit, the desired concentration is zero. For disinfectants, it is necessary to have a non-zero residual.

§290.104. Summary of Maximum Contaminant Levels, Maximum Residual Disinfectant Levels, Treatment Techniques, and Action Levels

TCC commented that although §290.104 states that the purpose of the section is to provide a list of all MCLs or SCLs in a single location, they found the repetition of the tables to be confusing and that inclusion of the tables created the potential for errors during the reproduction of the tables in other locations. The commenter stated that they understood the desire to consolidate the information into one single location, but they recommend that a separate guidance document that includes all of the MCLs and SCLs be created and referenced in the rule.

The commission responds that the language has been changed to clarify the purpose of including these sections. The drinking water standards are very complex, and there have been many requests from consumers as well as the regulated community to make the rules easier to use by summarizing the MCLs for easier reference.

TCC, COAu, and Eco/District noted that the MCL for fluoride is listed twice in the table contained in §290.104(b) and recommends that the second listing be removed.

The commission agrees with this comment and has revised the rule.

COAu commented that the definition of “annual dose equivalent to the total body” in §290.104(d)(3) was confusing. The commenter requested that the language be changed for clarity.

The commission responds that the determination of whether the concentration of radionuclides other than tritium or strontium 90, is based on a flow chart presented in EPA’s Radioactivity in Drinking Water Report (EPA 570/9-81-002, page 53). The use of the “annual dose equivalent to the total body” was intended as a simplification of the rather complicated process discussed by EPA. The language presented in this section has not been changed from the regulation currently contained in §290.110(a)(2). However, new federal regulations regarding radionuclides are imminent, and the commission will reconsider this comment in future rulemaking.

§290.105. Summary of Secondary Standards

TCC commented that although the rule states that the purpose of these sections is to provide a list of all MCLs or SCLs in a single location, they found the repetition of the tables to be confusing and that inclusion of the tables created the potential for errors during the reproduction of the tables in other locations. The commenter stated that they understood the desire to consolidate the information into one single location, but they recommend that a separate guidance document that includes all of the MCLs and SCLs be created and referenced in the rule.

The commission responds that the language has been changed to clarify the purpose of including these sections. The drinking water standards are very complex, and there have been many requests from the regulated community to make the rules easier to use by summarizing the MCLs for easier reference.

Eco/District noted that the allowable concentration of aluminum in water is stated as a range (0.05 to 0.20 mg/L) in §290.105, rather than as a single value, and questioned whether that was necessary.

The commission responds that this is a specific requirement of the federal rules.

§290.106. Inorganic Contaminants

Eco/District requested clarification of whether the samples used in compositing should be point of entry samples or random distribution samples. The commenter states that the language used in §290.106(c)(1)(C) is more confusing than the language used under §290.107 for organic contaminants.

As stated in §290.106(c), all inorganic sampling for the listed parameters is performed at the point of entry to the distribution system. The commission acknowledges that the compositing requirements of new §290.106(c)(1)(C) are more complex than those of new §290.107(c)(1)(E) and (2)(E). However, some provisions of the inorganic regulation (i.e. compositing may be done in either the field or in the laboratory) are more flexible than those for the organic regulations while other provisions (i.e. samples from multiple surface water sources cannot be composited) are more restrictive.

Eco/District recommended that the compositing described in §290.106(c)(1)(C)(ii) be allowed for wholesale receiving systems (purchased water systems) as well as groundwater systems.

The commission responds that it would be inappropriate to include purchased water sources in a composite sample because the purchased water sources will already have been sampled at the point of entry to the distribution system. Essentially, purchased water systems with no other source of water are exempt from the inorganic monitoring required by §290.106(c)(1).

TXU and Eco/District noted that the word “nitrite” was incorrectly spelled as “nitrate” in §290.106(c)(7)(A)(iii).

The commission responds that this typographical error has been corrected in the adopted rule.

Eco/District requested clarification of whether a repeat sample as required by §290.106(c)(7)(A)(iii), will be collected by TNRCC’s contractor within the required 24 hours, or may the system choose to collect the repeat sample.

The commission responds that, although current practice is that the repeat sampling is performed by TNRCC’s contractor, sample collection scheduling is coordinated by the public drinking water program and results are submitted to TNRCC by the contract laboratory, it remains the responsibility of the system to comply with these rules.

Eco/District questioned whether inclusion of the language in §290.106(e) regarding submittal of analytical results meant that TNRCC's contract laboratory would no longer be submitting results directly to TNRCC.

The commission responds that although current practice is for sampling to be performed by TNRCC's contractor and results submitted to TNRCC by the contract laboratory, it remains the responsibility of the system to comply with these rules.

Eco/District commented that the wording regarding submittal of analytical results in §290.106(e) should be changed to require submittal of this data within ten days of receipt of the results from the analytical laboratory, instead of requiring submittal of results ten days after the sample is collected.

The commission agrees with the comment and has revised the rule.

§290.107. Organic Contaminants

Eco/District recommended that the requirements for compositing of samples be moved from (E) to (A) under §290.107(c)(1).

The commission acknowledges the merit of this comment. However, the commission has decided not to change the sequence of §290.107(c)(1) because the current analytical limitations preclude the use of composite samples when conducting synthetic organic chemical (SOC) analyses.

Basically, the detection limits for current analytical methods do not allow the use of composite

samples. Consequently, the commission has decided to leave composite sampling near the end of the SOC subsection.

COAu requested that the definition “detect” in §290.107(c)(1)(B)(ii) be clarified. The commenter questioned whether “detect” was defined as a concentration greater than the MCL or a concentration greater than the analytical detection limit listed in the federal regulations (40 CFR §141.24(H)(18)).

The commission responds that “detect” corresponds to the presence of a constituent at a concentration that exceeds the reported analytical detection limit of the certified laboratory which is performing the analysis.

TXU commented that the proposed change in the rule language in §290.107(c)(1)(D) regarding waivers for SOC monitoring appears to nullify previously submitted vulnerability assessments.

The commission responds that the intent was not to change the meaning of the rule, but to add clarity. It is not intended that the changes nullify previously submitted and approved vulnerability assessments.

Eco/District recommended that the requirements for compositing of samples contained in §290.107(c)(2) be moved from (E) to (A).

The commission acknowledges the merit of this comment. However, the commission has decided not to change the sequence of §290.107(c)(2) because the current analytical limitations preclude

the use of composite samples when conducting volatile organic compound (VOC) analyses.

Basically, the detection limits of the current analytical methods do not allow the use of composite samples. Consequently, the commission has decided to leave composite sampling near the end of the VOC subsection.

COAu requested that the definition “detect” in §290.107(c)(2)(B)(iv) be clarified with respect to VOCs. The commenter questioned whether “detect” was defined as a concentration greater than the MCL or a concentration greater than the analytical detection limit listed in the federal regulations (40 CFR §141.24(H)(18)). The commenter suggested that if the definition is that given in 40 CFR §141.24(H)(18), labs reporting compliance results should use these detection limits as their reporting limit to the water system.

The commission responds that “detect” corresponds to the presence of a constituent at a concentration that exceeds the reported analytical detection limit of the certified laboratory which is performing the analysis.

Eco/District and TXU commented that the acronym “SOC” is used erroneously in §290.107(c)(2)(C)(iv), and that the correct acronym is “VOC.”

The commission responds that this typographical error has been corrected in the adopted rule.

TXU commented that the proposed language of §290.107(c)(2)(D)(vi) requires the executive director to reconfirm a VOC waiver for a groundwater system within three years of the initial determination. The

commenter interprets this to mean that if a reconfirmation is not performed during this timeframe, the waiver is invalid and the system is required to sample on an annual basis. The commenter stated that the denial of reconfirmation of a waiver on the part of the executive director should require a positive action from the executive director, not inaction.

The commission responds that federal rules currently require a VOC monitoring waiver to lapse unless the primacy agency takes positive action to renew it. Although federal regulations preclude the automatic reconfirmation of an existing waiver, the commission responds that it is current practice to notify the system whenever a VOC waiver is bestowed, reconfirmed, or denied.

Eco/District questioned whether inclusion of the language regarding submittal of analytical results under §290.107(e) meant that TNRCC's contract laboratory would no longer be submitting results directly to TNRCC.

The commission responds that although current practice is for sampling to be done by TNRCC's contractor, it remains the responsibility of the system to comply with these rules.

Eco/District and TXU commented that the wording contained in §290.107(c)(1) regarding submittal of analytical results should be changed to require submittal of this data within ten days of receipt of the results from the analytical laboratory, instead of requiring submittal of results ten days after the sample is collected.

The commission agrees with the comment and has revised the rule.

§290.108. Radiological Sampling and Analytical Requirements

Eco/District commented that the phrase “supplier of water” is often used in this section. The commenter requested clarification on whether “supplier of water” is synonymous with “producer(s) of water,” and recommends that if this is the case, the rule should be rewritten to use the phrase “producer of water,” because it is less ambiguous.

The commission agrees with the comment and the phrase “supplier of water” has been replaced with “public water system” rather than “producer of water.”

COAu commented that the locations for monitoring of radionuclides contained in §290.108(c) are not made clear in the proposed rule.

The commission sympathizes with the commenter. Monitoring plans are unique to each facility., and are required to be approved by TNRCC. Sampling locations are specified in a system’s monitoring plan based on the quality of the sources of drinking water for that system. It is anticipated that within a year, TNRCC will reopen these regulations to incorporate provisions of new federal radionuclide regulations, and TNRCC hopes to provide further guidance on monitoring location requirements at that time.

Eco/District and TXU commented that the wording regarding submittal of analytical results in §290.108(e) should be changed to require submittal of this data within ten days of receipt of the results from the analytical laboratory, instead of requiring submittal of results ten days after the sample is collected.

The commission agrees with the comment and has revised the rule.

Eco/District questioned whether inclusion of the language contained in §290.108(e) regarding submittal of analytical results meant that TNRCC's contract laboratory would no longer be submitting results directly to TNRCC.

The commission responds that, although current practice is that sampling is done by TNRCC's contractor, it remains the responsibility of the system.

§290.109. Microbial Contaminants

COAu requested clarification of the monitoring requirements for bacteriological samples, as required in §290.109(c)(2)(B). The commenter questioned whether systems of a certain size fall under any requirement to take daily samples.

The commission responds that THSC, §341.033, requires systems serving at least 25,000 persons to test the water at least once daily to determine its sanitary quality. In addition, the adopted new regulation requires these public water systems to collect bacteriological samples at regular intervals throughout the month and to monitor the disinfectant residual of the water in the distribution system on a daily basis. The commission is aware that most public water systems either operate or utilize microbiological laboratories that operate during a five-day workweek with microbiological samples only analyzed four days each week. The commission believes that systems can comply with both statutory and regulatory requirements if the public water system: 1) verifies on a daily basis (i.e. seven days per week), that the disinfectant residual of the water in

the distribution exceeds minimum regulatory requirements; and 2) collects the required number of monthly microbiological sample at intervals that evenly distribute samples throughout the sampling days of the month.

For example, a system collecting 40 samples per month (i.e., ten samples per week) could collect three microbiological samples daily on Monday and Thursday and two microbiological samples daily on Tuesday and Wednesday. The system could also conduct two or three chlorine residual tests in the distribution system during each day of the week (i.e. Sunday through Saturday) to confirm that the disinfectant residual has not fallen below minimum acceptable levels.

Eco/District questioned whether inclusion of the language in §290.109(e) regarding submittal of analytical results meant that TNRCC's contract laboratory would no longer be submitting results directly to TNRCC.

The commission responds that although current practice is for sampling to be done by TNRCC's contractor, it remains the responsibility of the system to comply with these rules.

Eco/District and TXU commented that the wording regarding submittal of analytical results in §290.109(e) should be changed to require submittal of this data within ten days of receipt of the results from the analytical laboratory, instead of requiring submittal of results ten days after the sample is collected.

The commission agrees with the comment and has revised the rule.

§290.110. Disinfectant Residuals

Eco/District, COAu and TXU commented on the sampling requirements of §290.110(c) for disinfectants entering the distributions system. Eco/District noted that as written, these rules do not specify that they apply to systems treating surface water or groundwater under the direct influence of surface water. COAu commented that the disinfectant concentrations should be clarified in §290.110(c)(5)(A) and (C). TXU noted that groundwater systems were erroneously included in language intended to refer to systems treating surface water or groundwater under the direct influence of surface water. Additionally, TXU noted that some noncommunity groundwater systems may not have a consistent demand on a daily basis, therefore distribution inlet samples would not be representative of residuals in use.

The commission responds that the referenced section applies only to systems treating surface water or groundwater under the direct influence of surface water, and has revised the rule.

COAu requested clarification of the type of systems that are required to take daily samples under §290.110(c)(5).

The commission responds that systems which treat surface water or groundwater under the direct influence of surface water must take daily samples. Systems which treat groundwater and serve at least 750 people on a daily basis must take daily samples. Systems that purchase potable water and serve at least 750 people on a daily basis must take daily samples. Systems that use only groundwater or purchased water and serve fewer than 750 people are not required to take daily samples; they must take samples once a week.

TXU, COAu, and Eco/District commented that the language in §290.110(e) makes the reporting requirements that follow unclear.

The commission agrees with the comment and has changed the wording to clarify the reporting requirements.

EPA commented that there was no date in the proposed rules by which public water systems were to begin disinfection profile monitoring, although the rules do specify that monitoring plans must be submitted by January 1, 2001.

The commission responds that §290.110(e)(2) has been revised to specify that public water systems must use new TNRCC Form 00102 after January 1, 2001. The new form requires data on disinfection profile monitoring.

EPA commented that no accompanying regulatory language for determining compliance was proposed for chlorines and chloramines.

The commission has added new §290.110(f)(9) to clarify that chlorines and chloramines are included in determining compliance with MRDLs.

COP commented that the requirement for public notification in §290.110(g)(5)(B) with regard to new maximum residual levels is undesirable because that notification will serve no purpose except to scare residents who have no technical knowledge of the system.

The commission responds that the public notification requirements for violation of the MRDLs contained in the adopted rule are explicitly required as part of the federal rules.

§290.111. Turbidity

NETMWD, Eco/Donna, and COAu supported the requirement of §290.111(a) that systems serving less than 10,000 people meet the combined filter effluent turbidity limits on the same schedule as systems serving at least 10,000 people. TML opposed this provision. NETMWD further commented that systems would be wise to go an additional step and optimize their systems to provide even better protection. COAu noted that reducing turbidity levels at all sizes of systems is in the best interest of public health, and reduces confusion among water suppliers regarding the standard that must be met. Eco/Donna commented that customers in small towns deserve equal treatment with customers in large cities. The commenter noted that in Milwaukee, Wisconsin in 1995, 400,000 people became ill and more than 100 died from *Cryptosporidiosis*.

The commission appreciates the support that the regulated community has shown for protection of public health for all citizens, not merely in this rulemaking process, but as a daily activity for many years.

In extensive comments, TML opposed making the combined filter effluent turbidity provisions of the Interim Enhanced Surface Water Treatment Rule applicable to systems serving less than 10,000 people at the same time that the provisions become effective for systems serving more than 10,000 people.

First, TML commented that city officials in Texas take fierce pride in the quality of their drinking water and their city's reputation for meeting health, safety and environmental requirements. The commenter further states that a sign at the edge of a town identifying the water system as "superior" is often considered essential for attracting new citizens and businesses. Finally, TML explained, the stigma of being identified as non-compliant may generate grave debate in a city.

The commission recognizes and appreciates the dedication of drinking water professionals in municipalities throughout Texas. The quality of these systems is demonstrated by the fact that 85% of the surface water systems in Texas serving less than 10,000 people already produce treated water with a combined filter effluent turbidity less than 0.3 NTU on a regular basis. While the stigma associated with higher turbidity levels may generate a vigorous debate within the local community, the commission believes that such a debate will serve to accelerate efforts to improve water quality while the lack of such debate will only leave the citizens unaware that their water treatment facility needs to improve its design or operations and that they are at increased risk of waterborne disease. Since 1995, the public drinking water program through the Texas Optimization Program, has been helping systems identify the cause of performance problems and offering a variety of technical assistance opportunities to systems that have turbidity over 0.3 NTU. The commission intends to continue to work directly with these smaller systems prior to the effective date of the rules and work together to achieve a solution which will simultaneously keep a system in compliance while ensuring that its customers receive water as safe as the water received by citizens of larger cities.

Second, TML commented that city officials will be put in the defensive posture of trying to explain and assure citizens that their drinking water is safe. TML states “The real or perceived linkage of these rules to *Cryptosporidiosis* will make the officials’ task more daunting.”

The commission responds that the link between turbidity and increased risk to public health is well established. Serious public epidemics such as the one that affected the population of Milwaukee, Wisconsin in 1995, have been associated with even slight turbidity increases. Neither the scientific community nor the regulatory community questions the relationship between higher turbidity and higher risk to public health. The commission will continue to work with the water utilities industry in their efforts to educate its customers on the nature and magnitude of the risks posed by *Cryptosporidium*.

Third, TML commented on the availability of funds from the Drinking Water State Revolving Fund (DWSRF) for projects designed to help systems achieve lower filtered water turbidity. Currently, DWSRF loans are prioritized based on failure to comply with existing rules. One of the commission’s motivations for proposing to make the combined filter effluent provisions apply to small systems at the same time they apply to large systems was to improve these systems’ access to funding. TML recommended that the procedure for obtaining DWSRF funds be altered to make funds available to systems that are likely to be out of compliance with an upcoming rule.

The commission agrees with the commenter’s concern regarding funding for capital improvements needed to meet the new turbidity rules. For that reason, the commission intends to extend the compliance deadline for the new turbidity standards until January 1, 2004, for systems needing

capital funding. In addition, our staff is pursuing options to revise the DWSRF funding procedures so that systems that cannot comply with a promulgated rule can access DWSRF funds even before the effective date of the rule. In addition, the commission notes that there are several funding sources which may provide funds to comply with existing rules.

Fourth, TML commented on the likelihood that provisions other than those contained within this rule will be applicable to small systems serving less than 10,000 people in the future. The commenter stated, "Two years from now there may be a different public health threat or need..."

The commission responds that the Long Term Stage 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) proposed by the EPA on April 10, 2000, contains the requirement that systems serving fewer than 10,000 people achieve a turbidity of 0.3 NTU or less in 95% of their combined filter effluent compliance samples. The commission expects that the final rule will be promulgated this fall. TNRCC will bring together a stakeholder group to develop draft language for the corresponding Texas rules in the fall of 2000. It is extremely unlikely that this provision will change when the federal rule is promulgated, because EPA's cost benefit analysis shows that the benefits from increased public health protection exceed the costs of implementation.

Finally, TML commented that in the course of preparing their comments, they contacted seven of the thirteen small cities identified by TNRCC as most likely to require capital improvements to meet the lower turbidity requirements. These cities and officials had previously spoken with TNRCC staff.

TML states that the preference of these cities was to find a way to compete for funding without going through the process of being out of compliance.

The commission responds that the agency has an ongoing commitment to including stakeholder input in rule development and for that reason assembled the stakeholder group which included representatives of Texas Municipal League; Texas AIDS Network; Texas League of Women Voters; Texas Rural Water Association; Texas Water Utilities Association; Texas Section of the American Water Works Association; Clean Water Action; TNRCC Field Operations staff; representatives from small utilities, medium sized utilities, large utilities, utilities treating groundwater, and utilities treating surface water, were asked to participate in an series of meetings to develop the draft proposed rules. The individuals representing the entities who chose to participate in that process reached a consensus that customers of small systems deserved the same public health protection as customers of large systems, that elevated turbidity represents an acute public health threat, and that the fiscal impacts to small systems should be addressed through the availability of an extension for those systems needing capital improvements to meet the new turbidity requirements. The commission appreciates the efforts of its stakeholder groups and believes that the adopted rule incorporates the best option available for ensuring compliance.

In summary, the commission reiterates its dedication to provide extensions to those public water systems which will require capital improvements to meet the turbidity requirements, and to provide technical assistance to those systems which will require operational changes to meet the new rules.

COAu noted that small systems (serving less than 10,000 people) which receive an extension to the turbidity requirements under §290.111(c)(2)(i), should be required to meet those turbidity requirements

at the time mandated by the federal government in the proposed Long Term Stage 1 Enhanced Surface Water Treatment Rule.

The commission agrees with the comment and believes that the adopted rules will conform with federal requirements for turbidity levels in combined filter effluent.

EPA commented that follow-up activities for individual filter performance triggers have distinct timeframes in which they must be completed. These timeframes were not in the proposed rules.

The commission has revised §290.111(c)(5)(A) - (C) to include timeframes for exceeding filtered water turbidity levels.

COAu commented that §290.111(d)(3)(B) essentially requires every plant to have at least one spare turbidimeter on-site because it takes seven to ten days to get a turbidimeter repaired by a major manufacturer and in order to have the turbidimeter repaired, it must be uninstalled. The commenter suggested that the requirement for a spare turbidimeter be stated explicitly in the rule.

The commission responds that the intent is to comply with the minimum requirements contained in the federal requirements. The commission notes that the availability of turbidimeter repair may vary based on local conditions, so the commission has not altered the language.

EPA commented that there was no date in the proposed rules by which public water systems were to begin disinfection profile monitoring, although the rules do specify that monitoring plans must be submitted by January 1, 2001.

The commission responds that §290.111(e)(2) has been revised to specify that public water systems must new TNRCC Form 00102 after January 1, 2001. The new form requires data on disinfection profile monitoring.

COAu commented that the turbidity level for public notification in §290.111(g)(1) should be 1.0 NTU.

The commission disagrees with the comment. A turbidity level of 5.0 NTU is specified under §290.42 as the level at which a system is absolutely required to issue a notice to boil water. The commission's field operations staff may require a notice to boil water at lower turbidity levels if field conditions indicate that public health may be at risk. Additionally, regardless of the turbidity level, the system may issue a notice to boil water under conditions that they deem may endanger the public health.

§290.112. Total Organic Carbon (TOC)

COAr commented that although the rules requiring that total organic carbon purport to address lowering of disinfection by-products, there is no recourse for a system that has virtually no disinfection by-products under current operating conditions. The commenter suggests that alternative compliance criteria number four be revised to include systems with total trihalomethanes less than 40 ug/L and haloacetic acids (group of five) less than 30ug/L, regardless as to whether only chlorine is used in the

plant and distribution system. Specifically, COAr requested that the rule be revised for systems which use primary disinfection with ozone and residual disinfection with chloramines, to add an alternative to alternative compliance criteria number four under §290.112(b)(2).

The commission agrees in principle with the commenter and would note that the specific process used by COAr (ozone and chloramines) is not the only disinfection protocol that can achieve significantly reduced levels of disinfection by-products in the distribution system. In fact, the commission raised a similar issue and comments on the proposed federal rule, however, EPA did not revised the rule in response to the comment. In addition, we note that in the federal rule, consideration is given to systems that make a financial commitment to install technology to lower the levels of disinfection by-products. We suggest that the act of producing water with low levels of disinfection by-products on an on-going basis represents an implicit commitment to technology that produces fewer disinfection by-products. Under new §290.102(b), the executive director may grant a variance or exemption to one or more of the MCLs or treatment technique requirements in this chapter when a system is unable to comply with a specified allowable level because of compelling factors (including economic). The variance or exemption may be granted if the variance or exemption will not result in an unreasonable risk to public health, and the system must establish a schedule to bring the system into compliance with the standard. Public comment and public hearing procedures in 40 USC §300g are applicable to such variances and exemptions, and such variances and exemptions are subject to the provisions of 40 CFR §141 and §142. Since the executive director may grant a variance or exemption under §290.102, the commission has decided not to revise the rule to add an alternative criteria to §290.112(b)(2) as requested by COAr.

COAu noted that in §290.112(c)(3) the word “at” was used where the word “and” should have been used.

The commission agrees with the comment and has revised the rule.

COAu noted that in §290.112(c)(4) the word “at” was used where the word “and” should have been used.

The commission agrees with the comment and has revised the rule.

COAu noted that in §290.112(c)(5) the word “at” was used where the word “and” should have been used.

The commission agrees with the comment and has revised the rule.

EPA commented that federal reporting requirements state that systems must report to the state within ten days after the end of each monitoring period. The proposed rules grant 20 days.

The commission has revised §290.112(e)(1) to require systems to report within ten days after each monitoring period.

COAu noted that the reporting requirements for magnesium in §290.112(e)(3)(E) appear to be incorrect. The commenter noted that to meet this alternative compliance criteria, the system must measure and report the running annual average source water magnesium concentration.

The commission agrees with the comment and has revised the rule.

COAu noted that the compliance calculation in §290.112(f)(3)(A) is incorrect. The commenter referenced the federal requirement that the monthly percent removal must be calculated based on the average removal of all TOC sample sets taken in a month.

The commission agrees with the comment and has revised the rule.

COAu requested clarification of whether all TOC sample sets taken in a month must be used to determine compliance.

The commission responds that as required by federal rule, all samples taken in accordance with the system's monitoring plan must be considered in determining compliance.

COAu requested guidance on whether the sum of monthly removal ratios for the previous 12 months divided by 12, as provided in §290.112(f)(3)(D), was equivalent to the running annual average of the quarterly averages of the monthly averages required by the federal rule.

The commission responds that although the intent of this language was equivalency with the federal rule, the commenter's point is well-taken, and the language referred to has been revised in the adopted rule to clarify the calculation method. The running annual average of quarterly averages of monthly averages is calculated as follows: determine the average for each month, then determine the average for the quarter based on the monthly averages. The running annual average is the average of the last four quarterly averages.

§290.113. Disinfection By-products (TTHM and HAA5)

TCC commented that only one laboratory in Texas is certified by the TDH, Bureau of Laboratories to analyze samples for both trihalomethanes and haloacetic acids, and stated that requiring all the water treatment plants in the state to use this laboratory would be a burden.

The commission responds that the samples must be analyzed at a certified laboratory to meet the federal rule requirements.

COP commented that the requirement for public notification with regard to disinfection by-products should not be included in the adopted rule because that notification will serve no purpose except to scare residents who have no technical knowledge of the system.

The commission responds that the public notification requirements for violations of the new MCLs for disinfection by-products contained in the adopted rule, are explicitly set out as part of the federal rules, and the commission is required to adopt this portion of the rule.

Eco/District commented that either the phrase “and use surface water sources or groundwater sources that are under the direct influence of surface water” should appear after the phrase “serve fewer than 10,000 persons” in §290.113(a)(2), or the rule should be rewritten to state that all systems must comply with the rule.

The commission responds that federal Stage 1 Disinfectants and Disinfection By-products Rule requires all systems to comply with the regulations regarding total trihalomethanes and haloacetic acids (group of 5). However, the effective dates for compliance differ for large systems and all other systems. Therefore, the specific compliance dates for specific types of systems are specified in this paragraph.

TCC requested that §290.113(a)(3), requiring groundwater systems serving more than 10,000 people to comply with §290.115 (relating to Transition Rule for Disinfection By-products) until January 1, 2004, remain current with the federal rule.

The commission responds that the federal Stage 1 Disinfectants and Disinfection By-products Rule requires all systems to comply with the regulations regarding total trihalomethanes and haloacetic acids (group of 5). However, the effective dates for compliance differ for large systems and all other systems. Therefore, the specific compliance dates for specific types of system are given in this paragraph.

COAu questioned whether there was some method that would allow for a system to obtain information for proper operation of the system without sampling in such a manner that the samples collected would be considered when calculating the system's compliance.

Although the federal rule requires that all samples taken at the sampling sites designated in the system's monitoring plan must be considered in calculating compliance. Samples taken at any other locations not designated as sampling sites in the monitoring plan, may be used as process control samples. The results from process control samples will not be included in calculating compliance.

COAu questioned why TTHM and HAA5 levels of 0.060 mg/L and 0.045 mg/L, respectively, are required by §290.113(c)(4)(B) for remaining on reduced monitoring while TTHM and HAA5 levels of 0.040 mg/L and 0.030 mg/L, respectively, are required to be placed on reduced monitoring.

The commission responds that the intent is to comply with the federal requirements. The federal rule recognizes that the reduced monitoring protocol is a worse case protocol than the routine monitoring protocol. The samples that are eliminated when a system is placed on reduced monitoring are those that are likely to have lower concentrations of TTHM or HAA5.

TCC requested clarification under §290.113(d) that trihalomethane and haloacetic acid samples will be collected by TNRCC or its contractor.

The commission responds that current practice is for sampling to be done by TNRCC's contractor, it remains the responsibility of the system to comply with these rules. The TNRCC currently employs a contractor to collect these samples. This sample collection is performed as a service to the utilities, to ensure that sampling is done in a timely manner, and to ensure that samples are collected correctly. However, it is not within the scope of these regulations to shift responsibility away from the utility. It is possible that sampling practices may change in the future, and the regulations must allow for any possible changes.

Eco/District questioned whether inclusion of the language in §290.113(e) regarding submittal of analytical results meant that TNRCC's contract laboratory would no longer be submitting results directly to TNRCC.

The commission responds that although current practice is for sampling to be done by TNRCC's contractor, it remains the responsibility of the system to comply with these rules.

TCC recommended that the results of trihalomethane and haloacetic acid analysis required by §290.113(e) be reported on the Surface Water Monthly Operating Report.

The commission responds that current practice is for TNRCC to receive the results of trihalomethane and haloacetic acid analyses from the certified contract laboratory which performs the analyses. Furthermore, since TTHM and HAA5 samples are not required monthly, submission of the results with the MOR seems inappropriate.

Eco/District commented that the wording regarding submittal of analytical results in §290.113(e) should be changed to require submittal of this data within ten days of receipt of the results from the analytical laboratory, instead of requiring submittal of results ten days after the sample is collected.

The commission agrees with the commenter and the language has been revised.

TCC requested that TNRCC provide guidance on whether quality control and quality assurance samples need to be reported under §290.113(e), and if so, why, since TNRCC can audit these results at the water treatment plant.

Currently, TNRCC receives the results of quality assurance and quality control analyses from the certified contract laboratory that performs the analyses. If for some reason the public water system was directly sampling, analyzing, and reporting sampling results, then the results of quality assurance and quality control analyses would also be required.

COAu asked whether compliance with the MCLs for TTHM and HAA5 described in §290.113(f)(3) was calculated based on “per plant” samples, or whether compliance was calculated based on the average of all the samples taken in the distribution system. The commenter expressed concern that averaging all the samples for the distribution system could cause a failure to note that the samples associated with a plant fell outside the MCL.

The commission responds that its intent is to comply with the minimum federal requirements.

Compliance with the MCLs for TTHM and HAA5 are based on the average of all samples taken in a distribution system.

§290.114. Disinfection By-products Other Than TTHM and HAA5

COP commented that the requirement for public notification with regard to disinfection by-products should not be included in the adopted rule because that notification will serve no purpose except to scare residents who have no technical knowledge of the system.

The commission responds that the public notification requirements for violations of the new MCLs for disinfection by-products contained in the adopted rule are explicitly set out as part of the federal rules.

§290.115. Transition Rule for Disinfection By-Products

COAu stated that §290.115(a)(1) incorrectly represents the effective date for applicability of the regulations regarding TTHM and HAA5 for groundwater systems serving more than 10,000 people.

The commission responds that the effective dates in the rule are correct. Groundwater systems serving 10,000 people or more must comply with the MCLs of the Stage 1 Disinfectants and Disinfection By-Products rule on December 16, 2003. Until then, groundwater systems serving 10,000 people or more must comply with the previously existing MCL for TTHM (0.10 mg/L). Section 141.130(b)(1) of the Stage 1 Disinfectants and Disinfection By-Products Rule, Code of Federal Regulations, states that “systems using only groundwater not under the direct influence of

surface water must comply with this support beginning December 16, 2003.” The technical corrections to the Stage 1 Disinfectants and Disinfection By-Products Rule will revise this date to January 1, 2004. The adopted rule contains two sections giving requirements for TTHM. Section 290.113 (relating to Disinfection By-Products: TTHM and HAA5) provides the new requirements resulting from the Stage 1 Disinfectants and Disinfection By-Products Rule. Section 290.115 (relating to Transition Rule for Disinfection By-Products) provides the previously existing rule requirements that will remain in place until the effective dates given in §290.113.

COAu questioned whether all samples throughout the distribution system are averaged together for the compliance calculations of §290.115(c)(2) or whether the samples associated with each plant are averaged for compliance.

The commission responds that the samples throughout the distribution system are averaged together for compliance.

COAu requested clarification regarding whether §290.115(c)(3) refers to this one sample per plant or to one sample per system. The commenter questioned, if it is one sample per system, why the other reductions for THMs are stated as number of samples per plant per quarter?

The commission responds that this refers to one sample per system. Other reductions are based on levels existing at individual plants, whereas this reduction is for the system as a whole, as long as all the plants in the system are consistently below the MCL.

COAu commented that if §290.115(c)(6) also applies to changes made under §290.114, it should be so stated.

The commission agrees with the comment and has revised the rule. The referenced language has been added to §290.114(f).

COAu commented that sections for IOCs, SOCs, VOCs, HAA5, microbiological, etc., state that testing for compliance shall be performed at a laboratory certified by the TDH, Bureau of Laboratories, and asked whether this should also be the case for current THM samples under §290.115(c)(7).

The commission agrees with the comment and has revised the rule.

§290.117. Regulation of Lead and Copper

TXU commented that a mechanism needs to be provided in §290.117(b) to allow for replacement of previously selected sites when these sample points are no longer valid or cease to exist.

The commission responds that this mechanism is in place, see §290.117(c)(3). Public water systems must notify TNRCC of the change and why it is needed.

COAu requested clarification on how a system can determine the “range of values for water quality parameters as approved by the executive director,” as required by §290.117(f)(1)(H).

The commission responds that the system should consult with an engineer or chemical supplier that specializes in corrosion control to set a proposed range of water quality parameters. The system should present this proposed range to the TNRCC. Upon approval, this range will become the “range of values for water quality parameters as approved by the executive director.”

TXU noted that §290.117(i) recognizes that the removal of lead-containing materials from the system is an appropriate means to reduce potential lead contamination, but only addresses the distribution system. The commenter recommended that a provision be added to address the special circumstances of noncommunity systems that own and control the entire system. Specifically, the commenter stated that systems of this type have the ability to eliminate lead-containing materials beyond the distribution system, and thereby may be capable of minimizing all possible sources of lead, up to and including the tap. The commenter suggested that the regulations be modified to recognize this as a viable response to an action level exceedance.

The commission responds that the installation of fittings and appurtenance containing more than 8% lead and solders that contain more than 0.2% lead at any service connection supplied by a public water system have been prohibited since 1988, see §290.46(i). In addition, although §290.117(i) does not require the replacement of internal lead-containing piping and fittings (including the tap), the subsection does not prohibit a public water system from taking such action as part of its overall lead abatement and corrosion-control strategy.

§290.118. *Secondary Constituent Levels*

Eco/District questioned whether inclusion of the language regarding submittal of analytical results under §290.118(d) meant that TNRCC's contract laboratory would no longer be submitting results directly to TNRCC.

The commission responds that although current practice is that sampling is done by TNRCC's contractor and results are reported to TNRCC by the laboratory, it remains the responsibility of the system to ensure that TNRCC has been notified of the results, comply with this section of the rule, see §290.118(e). No change in current practice is anticipated at this time.

Eco/District commented that the wording in §290.118(d) regarding submittal of analytical results should be changed to require submittal of this data within ten days of receipt of the results from the analytical laboratory, instead of requiring submittal of results ten days after the sample is collected.

The commission agrees with this comment and has revised the rule.

COAu asked where the monitoring requirements referred to in §290.118(e)(1) are located.

The commission responds that the language has been changed to clarify the monitoring requirements.

COAu requested clarification of the type of violation indicated by §290.118(e)(3).

The commission responds that the language has been changed to clarify that when a system exceeds a SCL for a constituent other than fluoride, they commit a SCL violation.

COAu commented that after the phrase “exceed the secondary maximum constituent level,” the next two uses of the word “constituent” should be replaced with the word “contaminant.”

The commission agrees and has revised the rule.

COAu commented that in §290.118(f)(1) after the phrase “exceed the secondary maximum constituent level,” the next two uses of the word “constituent” should be replaced with the word “contaminant.”

The commission agrees and has revised the rule.

COAu requested clarification of what kind of notification would be required by §290.118(f) in the event of a violation of the SCLs.

The commission responds that this requirement is contained in §290.118(g)(2), which states that the system must report the exceedance to new customers and in their consumer confidence report.

§290.119. Analytical Procedures

Eco/District commented that the commission should clarify the method by which laboratories will be approved by TNRCC, and how approved labs differ from certified labs. The commenter requested that §290.119(a)(2) should require that samples used to determine compliance with pH, alkalinity, chlorine

residual, chloramine residual, turbidity, and total organic carbon, be required to be tested using a method approved by the executive director instead of at a laboratory approved by the executive director.

The commission has not yet established the method it will use to approve laboratories. The TNRCC's staff intends to create a workgroup to identify and develop a reasonable approval process that will assure the reliability of the results obtained from the approved labs. The requirement to use state-approved laboratories is contained in federal regulations which provide some guidance regarding minimum approval requirements.

Eco/District requested clarification regarding the approval of process control tests in §290.119(c).

The commission responds that clarification has been provided by removing the paragraph. The meaning of "process control test" is a test run by the system, for the system, to determine anything that the system chooses to determine, as distinct from compliance sampling. The agency does not regulate process control tests, the system chooses its own testing method. However, systems should note that all samples taken at sampling points designated in the monitoring plan are considered compliance samples and are used in calculating compliance. The system should have other locations available to perform process control (non-compliance) testing.

§290.121. Monitoring Plans

Eco/District commented that because TNRCC's contractor is doing sampling, the utility should not be held responsible for the actions of that contractor, for example, if the contractor took a sample to an uncertified lab, or if the contract lab used an unapproved method.

The commission responds that, although current practice is that sampling is done by TNRCC's contractor, it remains the responsibility of the system to comply with these rules. As long as TNRCC continues to use a contractor, the contract will specify which labs are appropriate.

EPA commented that the monitoring plan under §290.121(b)(5) also applies to MRDLs which was not specified in the rule.

The commission also revised §290.121(b)(5) to include MRDLs.

COAu commented that the effective dates for submittal of monitoring plans in §290.121(c)(3) are incorrect and stated that the federal rule requires public water systems serving 10,000 people or more and treating groundwater to submit monitoring plans by 2002.

The commission responds that the federal Stage 1 Disinfectants and Disinfection By-Products Rule contains the requirement that all public water systems, regardless of size or source, must develop, implement and maintain a monitoring plan, but the federal rule does not require any groundwater systems to submit these monitoring plans to the state.

§290.122. Public Notification

COFW commented that the commission should include the provisions of the EPA public notice rules, promulgated May 4, 2000, in the current rulemaking.

The commission responds we will seek and receive comment from the regulated community on those provisions when the new federal public notice requirements are addressed during future rulemaking.

COAu commented that the turbidity level at which a system must issue a notice of an acute violation as required by §290.122(a)(1)(B) should be 1.0 NTU.

The commission disagrees with the commenter and responds that a notice to boil water is absolutely required when the turbidity of the water entering a distribution system exceeds 5.0 NTU. A field representative of the TNRCC may require that a notice to boil water be issued on a case-by-case basis, at a turbidity lower than 5.0 NTU, if he or she determines that public health protection requires it. In addition, the system may issue a notice to boil water at any time the system so desires.

STATUTORY AUTHORITY

The new and amended sections are adopted under the TWC, §5.103, which provides the commission the authority to adopt and enforce rules necessary to carry out its powers and duties under the laws of this state; under THSC, §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 USC §300f et. seq.; under THSC, §341.0315, which requires public water supply systems to meet the requirements of commission rules; and under THSC, §341.035, which requires the executive director of the commission to approve plans and specifications for public water supplies.

SUBCHAPTER D : RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS

§§290.38-290.41, 290.43-290.45, 290.47

§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 "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) **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 Texas Department of Health 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) **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.

(9) **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 definition);

(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.

(10) **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 hazard or impair the usefulness of the water.

(11) **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.

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

(14) **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.

(15) **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 Supply Systems).

(16) **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.

(17) **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.

(18) **Ground water 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.

(19) **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.

(20) **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.

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

(22) **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.

(23) **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 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.

(24) **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.

(25) **Maximum daily demand** - In the absence of verified historical data, maximum daily demand means 2.4 times the average daily demand of the system.

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

(27) **mg/l** - Milligrams per liter, a measure of concentration, equivalent to and replacing parts per million (ppm) in the case of dilute solutions.

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

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

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

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

(32) **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.

(33) **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.

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

(35) **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.

(36) **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.

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

(A) Southern Standard Plumbing Code.

(B) Uniform Plumbing Code.

(C) National Standard Plumbing Code.

(38) **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: bypass arrangements, jumper connections, removable sections or spools, and swivel or changeover assemblies.

(39) **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. The public drinking water program may be contacted at: Texas Natural Resource Conservation Commission, Water Permitting and Resource Management Division, MC 155, P.O. Box 13087, Austin, Texas 78711-3087.

(40) **Public health engineering practices** - Requirements in these sections or guidelines promulgated by the executive director.

(41) **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.

(42) **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.

(43) **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.

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

(45) **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.

(46) **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.

(47) **Uniform Fire Code** - The standards of the International Conference of Building Officials, 5360 Workman Mill Road, Whittier, California, 90601-2298.

§290.39. General Provisions.

(a) Authority for requirements. The Texas Health and Safety Code, Chapter 341, Subchapter C prescribes the duties of the commission relating to the regulation and control of public drinking water systems in the State. These statutes require 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 Health and Safety Code §341.035(d). The statutes also require 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 these sections and minimum criteria. These sections have 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 one-half mile of the corporate boundaries of a district, or other political subdivision providing the same service; or within one-half 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 State Board of Registration for 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 these sections 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 commission's public drinking water program in writing upon completion of all work.

(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 wellsite 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 transferrable.

The bond shall be retained by the owner and transferred when a change in ownership occurs.

(4) Copies of each fully executed sanitary control easement shall be provided to the executive director prior to placing the well into service. Each original easement document must be recorded in the deed records at the county courthouse. See §290.47(c) of this title (relating to Appendices) for 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 proposed 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, §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 Texas Water Code, §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 Texas Health & Safety Code, Chapter 361 or 382 or Texas Water Code, 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 commission's public drinking water program shall be notified in writing by the design engineer or the owner when construction is started.

(3) Upon completion of the water works project, the engineer or owner will notify the commission's public drinking water program 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, or distribution facilities. Public water systems shall submit plans and specifications for the proposed changes upon request.

(1) Changes or additions to existing systems which result in an increase in production, treatment, or storage capacity shall require written notice to the executive director.

(2) Systems that use surface water sources or groundwater sources that are under the direct influence of surface water shall notify the executive director of any proposed change to the disinfection process used at the treatment plant including changes involving the disinfectants used, the disinfectant application points, or the disinfectant monitoring points. Changes to an existing disinfection process shall not be instituted without the prior approval of the executive director.

(3) Changes to the type of disinfectant used to maintain a disinfectant residual in the distribution system shall require written notice to the executive director.

(4) Changes or additions in existing distribution systems shall require written notification to the executive director when the change or addition 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).

(5) 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 the 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) The executive director will not require planning material on distribution line improvements when the entity has its own internal engineering staff or is required, by local ordinance, to submit the material to another political entity for review and approval. The review staff must be separate and apart from the engineering staff or firm charged with the design of the distribution extension under review. The planning material must be reviewed and certified to be in compliance with §290.44 of this title (relating to Water Distribution) by a registered professional engineer in the employ of the review entity. The effect of the distribution system improvements on compliance with §290.45

of this title (relating to Minimum Water System Capacity Requirements) must be evaluated. Should the proposed improvements result in an exceedance of the capacity requirements, written notice of the extent of the proposed improvements must be submitted 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 these regulations 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 these sections 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 should precede the submission of engineering plans and specifications for a proposed project.

(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.

(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 Texas Health & Safety Code, §341.035, that has a history of noncompliance with Texas Health and Safety Code, 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. 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. The form of the financial assurance will be as specified in Chapter 37, Subchapter O of this title (relating to

Financial Assurance for Public Drinking Water Systems and Utilities), and will be as specified by the executive director.

(3) 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 (relating to Financial Assurance for Public Drinking Water Systems and Utilities), 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.

(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 pipe lines 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) Ground water sources shall be located so that there will be no danger of pollution from flooding or from insanitary 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 PVC pipe meeting AWWA standards, having a minimum working pressure of 150 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 one quarter mile of a proposed wellsite shall be reported to the Commission along with existing or potential pollution hazards. These reports are required for community and nontransient, noncommunity ground water sources. Examples of existing or potential pollution hazards which may affect ground water 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 covering that portion of the land within 150 feet of the well location shall be secured from all such property owners and recorded in the deed records at the county courthouse. The easement 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. For the purpose of this 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 the easement must be constructed to public water well standards. Copies of the recorded easements shall be included with plans and specifications submitted for review.

(2) The premises, materials, tools, and drilling equipment shall be maintained so as to minimize contamination of the underground water 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 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) Special attention must be given to the construction, disinfection, protection, and testing of a well to be used as a public water supply source.

(A) Before placing the well into service, the commission's public drinking water program shall be furnished 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 copy of the Sanitary Control Easement; and an original or legible copy of a United States Geological Survey 7.5-minute topographic quadrangle showing the accurate well location. 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 will utilize a pressure cementation method in accordance with the AWWA Standard for Water Wells (A100-97), Appendix C: Section C.3 (Positive Displacement – Exterior Method); Section C.4 (Interior Method – Without Plug); Section C.5 (Positive Placement, Interior Method, Drillable Plug); Section C.6 (Placement Through Float Shoe Attached to Bottom of Casing). Cementation methods other than those listed in this subparagraph must be approved by the executive director prior to the construction of the well. 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 Texas Department of Health.

(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 the Texas Department of Health approved 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 Texas Department of Health 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 commission's public drinking water program 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 waste water 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 well 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. Each unit must terminate at least 18 inches above the concrete sealing block and at least two feet above the highest known water mark or 100-year flood elevation, whichever is higher.

(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) Completed pitless well unit installations must be provided with above ground level raw water sampling cocks, concrete sealing blocks and flow measuring devices.

(E) The well casing and pitless unit must be properly sealed and cemented in accordance with paragraph (3)(C) 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 commission's public drinking water program for review and approval.

(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)(M) - (P) of this section.

(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 proposed surface water impoundment or flowing supply in the area of diversion and its tributary streams.

(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, *Eserichia 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.

(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 commission's public drinking water program 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.

(3) 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 underground 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 units shall be

constructed of ductile iron or PVC pipe with a minimum pressure rating of 150 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.

(C) The 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.

(D) An all weather road shall be provided to the treatment plant and to the raw water pump station.

§290.42. Water Treatment.

(a) Capacity. Based on current acceptable design standards, the total capacity of the public water system's production and treatment facilities must always be greater than its anticipated maximum daily demand.

(b) Groundwaters.

(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 ground water 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)(10) 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.

(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 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. Effective January 1, 2002, the treatment process shall also be designed to provide a 2-log removal of *Cryptosporidium* oocysts. Treatment facilities constructed after October 1, 2000 shall be designed to achieve at least a 2-log removal of *Cryptosporidium* oocysts. The executive director may require additional levels of treatment in cases of poor source water quality.

(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.

(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 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. Effective January 1, 2002, the treatment process shall also be designed to achieve at least a 2-log removal of *Cryptosporidium* oocysts. Treatment facilities constructed after October 1, 2000 shall be designed to achieve at least a 2-log removal of

Cryptosporidium oocysts. The executive director may require additional levels of treatment in cases of poor source water quality.

(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 clear wells. 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.

(3) All plant piping shall be constructed so as to be thoroughly tight against leakage. Return of the decanted water or sludge to the raw water shall be adequately controlled so that there will be a minimum of interference with the treatment process. Any discharge of wastewater shall be in accordance with the appropriate statutes and regulations.

(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 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 15 days supply of chemicals at design capacity. 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) All chemical bulk storage facilities and day tanks shall be clearly labeled to indicate each tank's contents.

(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) Adequate containment facilities shall be provided for all liquid chemical storage tanks.

(I) Containment facilities must be large enough to hold the maximum amount of chemicals that can be stored in the tanks with a minimum freeboard of six inches.

(II) The materials used to construct containment structures must be compatible with the chemicals stored in the tanks.

(III) Incompatible chemicals shall not be stored within the same containment structure.

(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.

(7) 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 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.

(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 NTU and the treatment plant meets with turbidity requirements of §290.111 of this title (relating to Turbidity).

(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 gallon 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 of gravity rapid sand filters shall be based on a maximum design 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, a maximum design filtration rate of 5.0 gallons per square foot per minute must be used. 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 of pressure filters shall be based on a maximum filtration rate of 2.0 gallons per square foot per minute.

(iv) The design capacity of filtration facilities shall be based on the cumulative filter capacity with the largest filter out of service.

(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 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 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 twelve inches of sand with an effective size of 0.45 to 0.55 mm and twenty-four 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 twenty-four 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 (relating to Turbidity).

(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 with a capacity of 1.0 million gallons per day or more shall be equipped with an on-line turbidimeter.

(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 determine 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 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 gpm/sq. ft.) and usually not more than 35 inches vertical rise per minute (21.8 gpm/sq. ft.).

(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 Texas Department of Health 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 one of the Texas Department of Health's certified laboratories 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.

(G) Effective January 1, 2002, 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.

(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(1) of this title (relating to General Provisions).

(4) 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.

(5) Gas chlorination equipment and cylinders of chlorine shall be housed in separate buildings or separate rooms with impervious walls or partitions that separate the chlorine facilities from all other mechanical and electrical equipment. Housing shall be located above ground level as a measure of safety. Beginning January 1, 2001, chlorine cylinders and associated equipment may not be installed outside of buildings.

(6) 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 open 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 Uniform Fire Code (UFC).

(7) 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.

(8) 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 Uniform Fire Code (UFC).

(f) Other treatment processes. The adjustment of fluoride ion content, special treatment for iron and manganese reduction, special methods for taste and odor control, demineralization, corrosion control processes, and other proposals covering other treatment processes will be considered on an individual basis, pursuant to §290.39(1) of this title (relating to General Provisions). Package-type treatment systems and their components shall be subject to all applicable design criteria in this section. 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 title (relating to Drinking Water

Standards Governing Drinking Water Quality and Reporting Requirements for Public Drinking Water Supply 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 proof of a one-year manufacturer's performance warranty or guarantee assuring that the plant will produce treated water which meets minimum state and federal standards for drinking water quality.

(g) 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.

(h) Permits for waste discharges. Permits for discharging wastes from water treatment processes shall be obtained from the agency, if necessary.

(i) 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.

(j) Safety.

(1) Safety equipment for all chemicals used in water treatment shall meet applicable standards established by the Occupational Safety and Health Administration (OSHA) or the Texas Hazard Communications Act, Health and Safety Code, Title 5, Chapter 502.

(2) Systems must comply with United States Environmental Protection Agency (EPA) requirements for Risk Management Plans.

(k) 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 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.

§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 water line must be located below the frost line and in no case shall the top of the water line 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 water line sizes. These are minimum requirements for domestic flows only and do not consider fire flows. These requirements should be exceeded 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 water line 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 pounds per square inch (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 service connection for the accumulation of water usage data. Systems where no direct charge is made for the water shall be exempted 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 with a view to ultimately connecting them to provide circulation.

(e) Location of water lines.

(1) The following rules apply to installations of potable water distribution lines and wastewater collection lines, wastewater force mains 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.

(2) 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.

(3) Potable water distribution lines and wastewater collection lines or force mains that form parallel utility lines shall be installed in separate trenches.

(4) 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.

(5) 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 line/force main and the licensed professional engineer is able to determine that the existing line is not leaking, the new potable waterline shall be located at least two feet above the existing line, measured vertically, and at least four feet away, measured horizontally, from the existing line. Every effort shall be exerted not to disturb the bedding and backfill of the existing wastewater line.

(ii) Where a new potable waterline parallels an existing pressure rated wastewater line and it cannot be determined by the licensed professional engineer if the existing line is leaking, the existing wastewater line shall be replaced with a 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 line.

(iii) Where a new potable waterline parallels a new wastewater line/force main, the wastewater line shall be constructed of 150 psi pressure rated pipe. The new potable waterline shall be located at least two feet above the wastewater line, measured vertically, and at least four feet away, measured horizontally, from the wastewater line.

(B) New Waterline Installation - Crossing Lines

(i) Where a new potable waterline crosses an existing, non-pressure rated wastewater line, 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 centerline of the wastewater line. The potable waterline shall be at least two feet above the wastewater line. Whenever possible, the crossing shall be centered between the joints of the wastewater line. If the existing wastewater line is disturbed or shows signs of leaking, it shall be replaced for at least nine feet in both directions (18 feet total) with 150 psi pressure rated pipe.

(ii) Where a new potable waterline crosses an existing, pressure rated wastewater line, 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 centerline of the wastewater line. The potable waterline shall be at least six inches above the wastewater line.

Whenever possible, the crossing shall be centered between the joints of the wastewater line. If the existing wastewater line shows signs of leaking, it shall be replaced for at least nine feet in both directions (18 feet total) with 150 psi pressure rated pipe.

(iii) Where a new potable waterline crosses a new, non-pressure rated wastewater line and the standard pipe segment length of the wastewater line is at least 18 feet, 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 centerline of the wastewater line. The potable waterline shall be at least two feet above the wastewater line. Whenever possible, the crossing shall be centered between the joints of the wastewater line. The wastewater pipe shall have a minimum pipe stiffness of 115 psi at 5.0% deflection. The wastewater line shall be embedded in cement stabilized sand (see §290.44(e)(5)(B)(vi) of this title) 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 line 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 150 psi. An absolute minimum vertical separation distance of two feet shall be provided. The wastewater line shall be located below the waterline.

(II) All sections of wastewater line 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 line. The space around the carrier pipe shall be supported at 5 foot (or less) intervals with spacers or be filled to the springline with washed sand. Each end of the casing shall be sealed with water tight non-shrink cement grout or a manufactured water tight 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 line, the waterline will be encased as described for wastewater lines in section (II) above 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 water line and the wastewater line shall be provided. Both the waterline and wastewater line, 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 line, 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 centerline of

the wastewater line. The potable waterline shall be at least six inches above the wastewater line. Whenever possible, the crossing should be centered between the joints of the wastewater line. The wastewater pipe shall have a minimum pressure rating of 150 psi. The wastewater line shall be embedded in cement stabilized sand 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 sewer pipe. The use of brown coloring in cement stabilized sand for wastewater line bedding is recommended for the identification of wastewater force mains during future construction.

(6) Waterline and Manhole Separation. The separation distance from a potable waterline to a manhole 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 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 spring line with washed sand. The encasement pipe shall be centered on the crossing and both ends sealed with cement grout or manufactured seal.

(7) Location of Fire hydrants. Fire hydrants shall not be installed within nine feet vertically or horizontally of any sanitary sewer line regardless of construction.

(8) Location of Supply/Suction Lines. Suction mains to pumping equipment shall not cross wastewater lines carrying domestic or industrial wastes. Raw water supply lines shall not be installed within five feet of any tile or concrete wastewater line.

(9) 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 water lines.

(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 water lines 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 Executive Director's permission, 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 which shall be repeated if contamination persists. A minimum of one sample for each 1,000 feet of completed water line 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 allowed 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 §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 a executive director approved course on cross-connection control and backflow prevention assembly testing, pass an examination administered by the TNRCC or its designated agent and hold current professional certification 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 Marshall'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 record keeping purposes. Any form which varies from the format specified in Appendix F of this title (relating to Backflow Prevention Assembly Test and Maintenance Report) 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 National Sanitation Foundation. 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. The following requirements are to be used in evaluating both the total capacities for public water systems and the capacities at individual pump stations and pressure planes.

The capacities listed below are minimum requirements only. Additional supply, storage, service pumping, and pressure maintenance facilities will be required by the commission if a normal operating pressure of 35 psi cannot be maintained throughout the system, or if the system's maximum daily demand exceeds its total production and treatment capacity. Additional capacities will also be required if the system is unable to maintain a minimum pressure of 20 psi during fire fighting, line flushing and other unusual conditions. In all sections governing quantity requirements, total storage capacity does not include pressure tank capacity.

(b) Community Water Systems.

(1) Groundwater supply requirements are as follows:

(A) If fewer than 50 connections without ground storage, the system must have the following:

(i) a well capacity of 1.5 gallons per minute 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 have the following:

(i) a well capacity of 0.6 gallon per minute 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 gallons per minute 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 gallon per minute per connection must be provided.

(ii) A total storage capacity of 200 gallons per connection must be provided.

(iii) Each pump station or pressure plane shall have two or more pumps having a total capacity of 2.0 gallons per minute per connection. For systems which provide an elevated storage capacity of 200 gallons per connection, two service pumps with a minimum combined capacity of 0.6 gallons per minute 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 must be provided.

(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 gallons per minute per connection must be provided. Where an interconnection is provided with another acceptable water system capable of supplying at least 0.35 gallons per minute for each connection in the combined system under emergency conditions, an additional well will not be required as long as the 0.6 gallons per minute 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 must be provided.

(iii) Each pump station or pressure plane shall have two or more pumps that have a total capacity of 2.0 gallons per minute per connection or that have a total capacity of at least 1,000 gallons per minute 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 gallons per minute 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 must be provided. 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 §290.45(g)(2) of this chapter are met.

(v) Emergency power is required 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 gallons per minute 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 gallons per minute 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 commission review.

(E) Mobile home parks with a density of 8 or more units per acre and apartment complexes which supply fewer than 100 connections without ground storage must have the following:

(i) a well capacity of 1.0 gallon per minute 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 gallons per minute per connection must be provided. Systems with 250 or more connections must have either two wells or an approved interconnection which is capable of supplying at least 0.35 gallons per minute for each connection in the combined system.

(ii) A total storage of 200 gallons per connection must be provided.

(iii) At least two service pumps with a total capacity of 2.0 gallons per minute per connection must be provided.

(iv) A pressure tank capacity of 20 gallons per connection must be provided.

(2) All surface water supplies must provide the following:

(A) a raw water pump capacity of 0.6 gallon per minute per connection with the largest pump out of service.

(B) a treatment plant capacity of 0.6 gallon per minute per connection under normal rated design flow.

(C) transfer pumps (where applicable) with a capacity of 0.6 gallon per minute 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 gallons per minute per connection or that have a total capacity of at least 1,000 gallons per minute 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 gallons per minute 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 must be provided. 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 §290.45(g)(2) of this chapter are met.

(H) Emergency power is required 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 gallons per minute 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 gallons per minute 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 commission review.

(c) Noncommunity water systems serving transient accommodation units. The following water quantity requirements apply to noncommunity water systems serving accommodation units such as hotel rooms, motel rooms, travel trailer spaces, campsites and similar accommodations.

(1) Ground water supply requirements are as follows:

(A) If fewer than 100 accommodation units without ground storage, the system must have the following:

(i) a well capacity of 1.0 gallon per minute per unit; and

(ii) a pressure tank capacity of 10 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 have the following:

(i) a well capacity of 0.6 gallons per minute 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 gallon per minute per unit; and

(iv) a pressure tank capacity of 10 gallons per unit.

(2) All surface water supplies, regardless of size, must have the following:

(A) a raw water pump capacity of 0.6 gallons per minute per unit with the largest pump out of service;

(B) a treatment plant capacity of 0.6 gallons per minute per unit;

(C) a transfer pump capacity (where applicable) of 0.6 gallons per minute 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 gallon per minute per unit; and

(F) a pressure tank capacity of 10 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
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 supply requirements are as follows.

(A) If fewer than 300 persons per day are served, the system must have the following:

(i) a well capacity which can supply 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 commission.

(B) If 300 or more persons per day are served, the system must have the following:

(i) a well capacity which can supply 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 2.0 gallons per minute per connection must be provided;

(iv) if the maximum daily demand is 15 gpm or more, at least two service pumps with a total capacity of 2.0 gallons per minute per connection; 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, regardless of size, shall meet the following requirements:

(A) a raw water pump capacity which can meet the maximum daily demand of the system with the largest pump out of service;

(B) a treatment plant capacity which can meet 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 commission.

(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 systems supplying both retail and wholesale connections, the commission's production, treatment and service pumping capacity requirements for the system's wholesale connections are in addition to the commission's requirements for the system's retail connections.

(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 shall be available to the commission 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 plus the actual production capacity of the system shall be at least 0.6 gallons per minute 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 gallons per minute per connection or provide at least 1,000 gallons per minute and be able to meet peak hourly demands, whichever is less.

(6) All other minimum capacity requirements specified in this section shall apply.

(g) Exceptions. Requests for exceptions to one or more of these Minimum Water System Capacity Requirements 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 as specified in §290.39(l) of this title (relating to General Provisions).

(1) Exceptions to the minimum capacity requirements for public water systems may be granted upon application to and approval by the executive director. The application for an exception to the minimum capacity requirements must include:

(A) Provision of a detailed inventory of the major production, pressurization, and storage facilities utilized by the system.

(B) Provision of 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) The executive director may also require data acquired during the last drought period in the region.

(D) The peak demand days over the study period must utilize data on the number of active connections to determine the actual demand per connection experienced.

(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 required to evaluate the exception request.

(2) Although elevated storage is the preferred method of pressure maintenance for systems of over 2500 connections, it is recognized that local conditions may dictate the use of alternate methods utilizing hydropneumatic tanks and on-site emergency power equipment. Exceptions to the elevated storage requirements may be obtained based on application to and approval of the executive director. Special conditions apply to systems qualifying for an elevated storage exception.

(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 commission for review.

(iii) For existing systems, the system's licensed professional engineer must provide continuous 24 hour pressure chart recordings of distribution pressures maintained during past power failures, if available. The period reviewed should 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 8 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 commission. 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.

(3) Any exception granted pursuant to these requirements shall be subject to review at the time of each routine sanitary survey of the system. Failure to demonstrate satisfactory survey findings may result in revocation of the exception.

§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 these sections 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 title (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Supply 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 the Texas Department of Health Bureau of Laboratories or one of its approved laboratories. (A list of the approved laboratories can be obtained by contacting the Texas Department of Health Bureau of Laboratories).

(c) Chemical. Samples for chemical analysis shall be submitted as directed by the public drinking water program.

(d) Disinfectant residuals and monitoring. An acceptable disinfectant residual must be continuously maintained during the treatment process and throughout the distribution system.

(1) Disinfection facilities 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 in the far reaches of the distribution system at all times:

(A) a free chlorine residual of 0.2 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 certified personnel. All systems, except transient noncommunity systems which utilize ground or purchased water, must be under the direct supervision of a certified water works operator. The operator shall ensure that the water system complies with the requirements of this section.

(1) No district, municipality, firm, corporation, or individual, except transient noncommunity systems which utilize groundwater or purchased water, shall furnish to the public any drinking water unless the production, processing, treatment, and distribution are at all times under the direct daily supervision of a competent water works operator holding a valid certificate of competency issued under the direction of the executive director.

(A) A Class "D" certificate is valid for systems with 250 or fewer connections.

(B) Systems serving in excess of 250 connections must employ an operator with a Class "C" or higher certificate.

(C) Systems serving in excess of 1,000 connections must employ at least two Class "C" certified operators.

(D) Beginning January 1, 2004, systems that treat surface water must employ at least one operator who holds a Class "B" or higher surface water certificate.

(E) Until January 1, 2004, systems that treat surface water must employ at least one operator who holds a Class "B" or higher surface water certificate or who holds a Class "C" surface water certificate and has completed an executive director recognized 20-hour water laboratory course.

(2) Each surface water treatment plant must have at least a Class "C" 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 in which the plant is unattended.

(3) Systems that have sources which are classified as groundwater under the direct influence of surface water must be under the supervision of either an operator who has at least a Class "C" groundwater certificate and has completed additional training as designated in the following subparagraphs or an operator who has at least a Class "C" surface water certificate.

(A) Those systems which utilize cartridge filters must be under the supervision of at least a Class "C" groundwater operator who has completed an agency recognized 8-hour training course on monitoring and reporting requirements.

(B) Those systems which utilize coagulant addition and direct filtration must be under the supervision of at least a Class "C" groundwater operator who has completed an agency

recognized 20-hour Surface Water Production course and an agency recognized 8-hour training course on monitoring and reporting requirements.

(C) Those systems which utilize complete surface water treatment must comply with the requirements of paragraph (2) of this subsection.

(4) Certified operators must provide the public drinking water program with written, dated and signed notice of the public water systems which they operate or where they are employed when applying for, renewing, or upgrading their certification. This notice must be amended in writing within ten days of any change in responsibility.

(5) Training programs for all chemicals used in water treatment shall meet applicable standards established by the Occupational Safety and Health Administration (OSHA) or the Texas Hazard Communications Act, Health and Safety Code, Title 5, Chapter 502.

(f) Operating records and reports. Water systems must maintain a daily 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 each day;

(ii) the volume of water treated each day;

(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; and

(vi) the maintenance records for water system equipment and facilities.

(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 turbidity monitoring results and exception reports for individual filters as required by §290.111 of this title (relating to Turbidity);

(iv) the calibration records for laboratory equipment, flow meters, rate-of-flow controllers, on-line turbidimeters, and on-line disinfectant residual analyzers; and

(v) the records of backflow prevention device programs.

(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; and

(ii) Concentration Time (CT) studies for surface water treatment plants.

(D) The results of microbiological analyses shall be retained for at least five years.

(E) The following records shall be retained for at least 10 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 10 years after completion of the survey involved; and
- (iv) copies of the Customer Service Inspection reports required by subsection (j) of this section.

(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 any monthly or quarterly reports required by the executive director.

(A) The reports must be submitted to the Texas Natural Resource Conservation Commission, Water Permitting and Resource Management 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 AWWA requirements and water samples must be submitted to a laboratory approved by the Texas Department of Health. 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 one-half 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 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 Customer Service Inspection Certificate) 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.

(B) Customer service inspectors who have completed a commission approved course, passed an examination administered by the TNRCC or its designated agent and hold current professional certification or endorsement 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 Definitions).

(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, and no obligation, beyond the scope of the commission's regulations. A customer service inspection is not a plumbing inspection as defined and regulated by the Texas State Board of Plumbing Examiners (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 with 5000 or more inhabitants or within smaller, like entities which have adopted the Plumbing License Law by ordinance. 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 or more frequently 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 reliability and general appearance of the system's facilities and equipment.

(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 storage 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.

(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.

(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 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 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 Water Rates). 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, each certified operator who supervises more than one water system shall provide the public drinking water program written notices containing their certificate number, address and telephone number, and the name and identification number of each public water system which they supervise. Each operating company shall provide this information for itself and for each of its operators. 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 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 public drinking water program. 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 pursuant to 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 processes used by the system must be provided.

(1) Flow measuring devices and rate-of-flow controllers shall be calibrated at least once every 12-months.

(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 manufacturers specifications at least once each day.

(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 online 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) 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.

(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 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 commission's public drinking water program 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 installed in a securely mounted conduit in compliance with a local or national electrical code.

§290.47. Appendices.

(a) Appendix A. Recognition as a Superior or Approved Public Water System.

Figure: 30 TAC §290.47(a) (No change.)

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) (No change.)

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% 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) (No change.)

SANITARY CONTROL EASEMENT

DATE: _____, 20

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 insanitary 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 , 20 , 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 , 20

(d) Appendix D. Customer Service Inspection Certification.

Figure: 30 TAC §290.47(d)

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. | <input type="checkbox"/> | <input type="checkbox"/> |
| (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. | <input type="checkbox"/> | <input type="checkbox"/> |

- (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	<input type="checkbox"/>	Copper	<input type="checkbox"/>	PVC	<input type="checkbox"/>	Other	<input type="checkbox"/>
Solder	Lead	<input type="checkbox"/>	Lead Free	<input type="checkbox"/>	Solvent Weld	<input type="checkbox"/>	Other	<input type="checkbox"/>

I recognize that this document shall become a permanent record of the aforementioned Public Water System and that I am legally responsible for the validity of the information I have provided.

Remarks:

Signature of Inspector

Registration Number

Title

Type of Registration

Date

(e) Appendix E. Boil Water Notification.

Figure: 30 TAC §290.47(e) (No change.)

BOIL WATER NOTIFICATION

[INSERT NAME OF SYSTEM]

Due to conditions which have occurred recently in the water system, the Texas Natural Resource Conservation Commission 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 512/239-6020.

(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 record keeping 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 TNRCC 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		Relief Valve	Air Inlet	Check Valve
	1st Check	2nd Check		Opened at ____ psid	Held at ____ psid
Initial Test	Held at ____ psid Closed Tight <input type="checkbox"/> Leaked <input type="checkbox"/>	Held at ____ psid Closed Tight <input type="checkbox"/> Leaked <input type="checkbox"/>	Opened at ____ psid Did not open <input type="checkbox"/>	Did not Open <input type="checkbox"/>	Leaked <input type="checkbox"/>
Repairs and Materials Used					
Test After Repair	Held at ____ psid Closed Tight <input type="checkbox"/>	Held at ____ psid Closed Tight <input type="checkbox"/>	Opened at ____ psid	Opened at ____ psid	Held at ____ psid

Test gauge used: Make/Model _____ SN: _____ Calibration Date: _____

Remarks: _____

The above is certified to be true at the time of testing.

Firm Name _____ Certified Tester _____

Firm Address _____ Cert. Tester No. _____ Date _____

Firm Phone # _____

* 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) (No change.)

Section 290.46(e), Operation by Certified Personnel, paragraph 4, requires certified operators to provide a written, dated, and signed notice listing the public water systems which they operate or are employed. This is required when applying for, renewing, or upgrading a certificate of competency.

This notice must be amended in writing within 10 days of any change in responsibility.

SYSTEM NAME	I.D. #	COUNTY
1.		
2.		
3.		
4.		
5.		
6.		

7.		
8.		
9.		
10.		

Signature of Operator

Social Security Number

Grade of Certificate

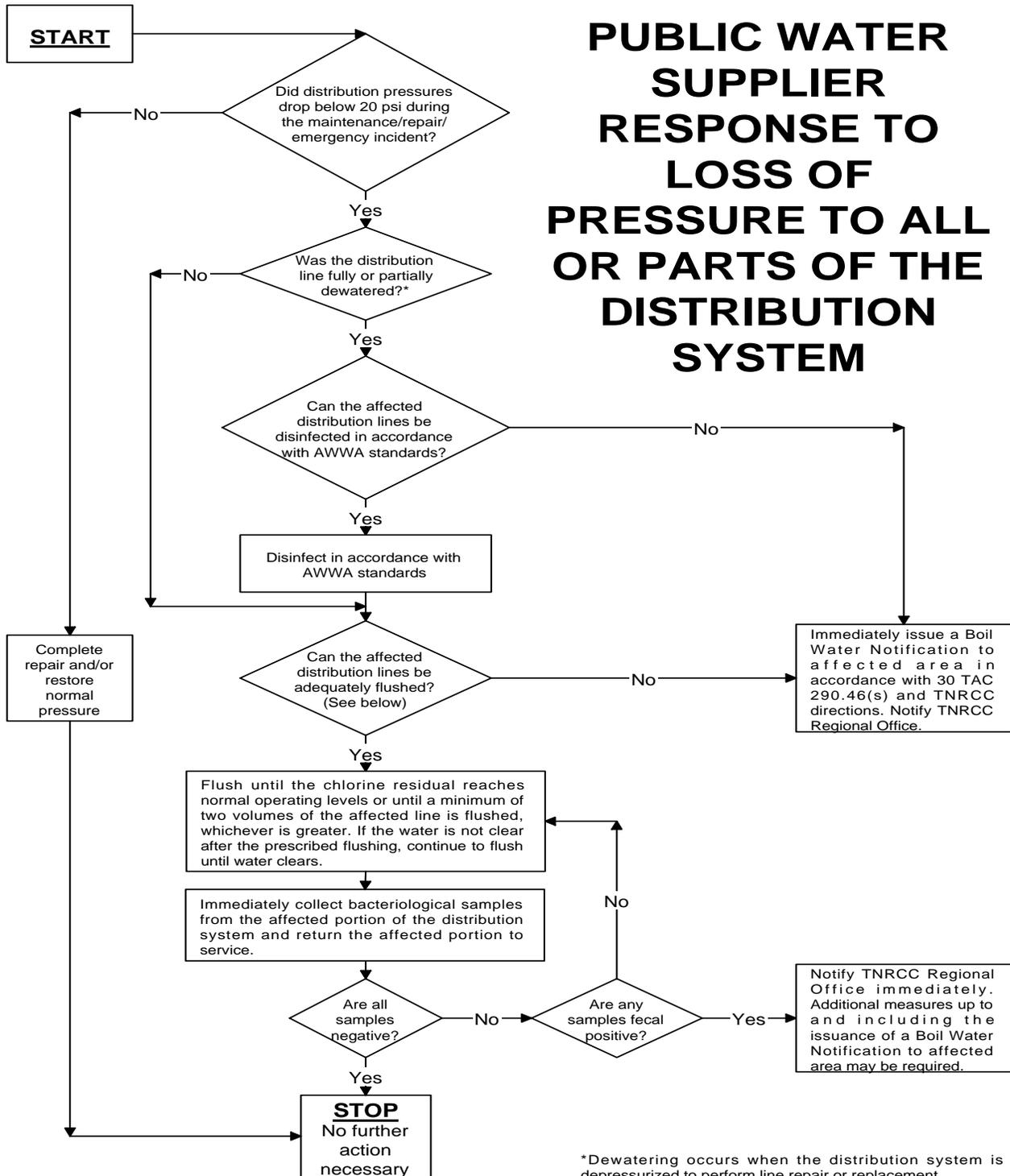
Expiration Date

This notice should be submitted to the Operator Certification Section, Compliance Support Division,
Texas Natural Resource Conservation Commission, P.O. Box 13087, Austin, Texas 78711-3087.

(h) Appendix H. Special Precautions Flowchart.

Figure: 30 TAC §290.47(h) (No change.)

PUBLIC WATER SUPPLIER RESPONSE TO LOSS OF PRESSURE TO ALL OR PARTS OF THE DISTRIBUTION SYSTEM



*Dewatering occurs when the distribution system is depressurized to perform line repair or replacement.

(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	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, 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
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 ft. 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	Nonhealth†	RPBA
Domestic	Nonhealth†	DCVA
Hose bibbs	Nonhealth†	AVB
Irrigation systems		
With chemical additives	Health	RPBA
Without chemical additives	Nonhealth†	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	Nonhealth†	PVB or AG
Public	Nonhealth†	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 hazards exists (due to toxicity or other potential health impact) additional area protection with RPBA is required.

SUBCHAPTER D : RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS

§290.42, §290.46

STATUTORY AUTHORITY

The repealed sections are adopted under the TWC, §5.103, which provides the commission the authority to adopt and enforce rules necessary to carry out its powers and duties under the laws of this state; under THSC, §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 USC §300f et. seq.; under THSC, §341.0315, which requires public water supply systems to meet the requirements of commission rules; and under THSC, §341.035, which requires the executive director of the commission to approve plans and specifications for public water supplies.

§290.42. Water Treatment.

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

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

§§290.101 - 290.121

STATUTORY AUTHORITY

The repealed sections are adopted under the TWC, §5.103, which provides the commission the authority to adopt and enforce rules necessary to carry out its powers and duties under the laws of this state; under THSC, §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 USC §300f et. seq.; under THSC, §341.0315, which requires public water supply systems to meet the requirements of commission rules; and under THSC, §341.035, which requires the executive director of the commission to approve plans and specifications for public water supplies.

§290.101. Purpose.

§290.102. Definitions.

§290.103. Standards of Chemical Quality.

§290.104. Control Tests.

§290.105. Maximum Contaminant Levels (MCLs) for Microbiological Contaminants.

§290.106. Bacteriological Monitoring.

§290.108. Inorganic Chemical Monitoring and Analytical Requirements.

§290.109. Organic Chemical (Other Than Trihalomethanes) Monitoring, Analytical Requirements and Treatment Techniques.

§290.110. Radiological Sampling and Analytical Requirements.

§290.111. Construction and Siting Requirements.

§290.112. Recordkeeping and Reporting Required of Water Systems.

§290.113. Secondary Constituent Levels.

§290.114. Modified Monitoring.

§290.115. Exceptions to these Standards.

§290.116. Control of Trihalomethanes in Drinking Water.

§290.117. Disinfection.

§290.118. Filtration.

**§290.119. Monitoring Requirements Relating to Turbidity and Disinfection for Systems Using
Surface Water Treatment.**

§290.120. Regulation of Lead and Copper.

§290.121. Laboratory Analyses.

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

§§290.101 - 290.115, 290.117 - 290.119, 290.121, 290.122

STATUTORY AUTHORITY

The new and amended sections are adopted under the TWC, §5.103, which provides the commission the authority to adopt and enforce rules necessary to carry out its powers and duties under the laws of this state; under THSC, §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 USC §300f et. seq.; under THSC, §341.0315, which requires public water supply systems to meet the requirements of commission rules; and under THSC, §341.035, which requires the executive director of the commission to approve plans and specifications for public water supplies.

§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 U.S.C. §300f et. seq., and the "Primary Drinking Water Regulations" which have been promulgated by the EPA.

§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.

(1) A variance may be granted to one or more of the MCLs or treatment technique requirements if all of the following conditions apply:

(A) the system's raw water is such that the maximum allowable level cannot be met despite the application of the best available treatment techniques (taking costs into consideration) subject to the following conditions;

(B) the public water system requesting the variance was in operation on the date the MCL or treatment technique requirement became effective;

(C) the granting of the variance will not result in an unreasonable risk to public health; and

(D) a schedule, including increments of progress, is established to bring the system into compliance with the standard in question.

(2) An exemption may be granted to one or more of the MCLs or treatment technique requirements when a system is unable to comply with a specified allowable level because of compelling factors (which may include economic). An exemption may be granted only under the following circumstances:

(A) the public water system requesting the exemption was in operation on the date the MCL or treatment technique requirement became effective or for a system that was not in operation by that date, if no reasonable alternative source of drinking water is available to such new system;

(B) the granting of the exemption will not result in an unreasonable risk to public health; and

(C) a schedule is established to bring the system into compliance with the standard in question.

(3) Applications for such variances or exemptions must be submitted to the executive director in writing by the owner of the water system. The request must include the following:

(A) a statement of the standard which is not met;

(B) an estimate of the risk involved to public health with supporting evidence from physicians or dentists in the area;

(C) a general long range plan for the correction of the problem. In addition, a detailed plan or compliance schedule must be submitted within one year following written notification that a variance or exemption has been granted; and

(D) a detailed economic evaluation of the current and future situation.

(4) A variance or exemption covering a group or class of systems with a common standard which is not met may be issued by the executive director without individual application.

However, individual compliance schedules will be required for each such system within one year following written notification by the executive director that such a variance or exemption has been granted. After receiving notification from the executive director that a group or class variance or exemption has been issued to their system, each system must submit the above items in accordance with paragraph (3) of this subsection.

(5) The executive director is required to act upon all requests for variances or exemptions within 90 days.

(6) Procedures for public comment and public hearings on variances, exemptions, and compliance schedules as a condition of a variance or exemption will be as stated in the EPA National Primary Drinking Water Regulations, 40 CFR §§141.4 and 142.20.

(c) 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) **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.

(2) **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.

(3) **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.

(4) **Disinfection profile** - A summary of daily *Giardia lamblia* and viral inactivation obtained through disinfection at the treatment plant.

(5) **Disinfection by-products (DBP)** - Chemical compounds formed by the reaction of a disinfectant with the natural organic matter present in water.

(6) **Enhanced coagulation** - The removal of disinfection by-product precursors to a specified level by conventional coagulation and sedimentation.

(7) **Enhanced softening** - The removal of disinfection by-product precursors to a specified level by softening.

(8) **Entry point to the distribution system** - Any point where freshly treated water 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.

(9) **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.

(10) **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.

(11) **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 summing.

(12) **Halogen** - One of the chemical elements chlorine, bromine, or iodine.

(13) **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.

(14) **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.

(15) **Minimum acceptable disinfectant residual** - The lowest disinfectant concentration allowed in the distribution system for microbial control.

(16) **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 m⁻¹) by its concentration of dissolved organic carbon (DOC) (in mg/L).

(17) **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.

(18) **Total trihalomethanes (TTHM)** - The sum of the chloroform, dibromochloromethane, bromodichloromethane, and bromoform concentrations in milligrams per liter, rounded to two significant figures after summing.

(19) **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.

§290.104. Summary of Maximum Contaminant Levels, Maximum Residual Disinfectant Levels, Treatment Techniques, and Action Levels.

(a) Summary table purpose. The maximum contaminant 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) Maximum contaminant levels (MCLs) for inorganic compounds. The maximum contaminant levels for inorganic contaminants listed below 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	0.05
Asbestos	7 million fibers/liter (longer than 10 μ m)
Barium	2.0
Beryllium	0.004

Cadmium	0.005
Chromium	0.1
Cyanide	0.2 (as free Cyanide)
Fluoride	4.0
Mercury	0.002
Nitrate	10.0 (as Nitrogen)
Nitrite	1.0 (as Nitrogen)
Nitrate & Nitrite (Total)	10.0 (as Nitrogen)
Selenium	0.05
Thallium	0.002

(c) Maximum contaminant levels (MCLs) for organic compounds. The following maximum contaminant levels 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 maximum contaminant levels 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 maximum contaminant levels 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	1.0
trans-1,2-Dichloroethylene	0.1
Trichloroethylene	0.005
Vinyl chloride	0.002
Xylenes (total)	10.0

(d) Maximum contaminant levels for radiological contaminants. Maximum contaminant levels for radiological contaminants apply to public water systems as provided in §290.108 of this title (relating to Radiological Sampling and Analytical Requirements). The maximum contaminant levels for beta particle and photon radioactivity from man-made radionuclides in drinking water are as follows.

(1) The maximum contaminant level for combined radium-226 and radium-228 is 5 pCi/l.

(2) The maximum contaminant level for gross alpha particle activity (including radium-226 but excluding radon and uranium) is 15 pCi/l.

(3) The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than four millirem (mrem)/year.

(4) If two or more radionuclides other than tritium or strontium-90 are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed four mrem/year.

Average annual concentrations of tritium or strontium-90 assumed to produce a total body or organ dose of four mrem/year are as follows:

Figure: 30 TAC §290.104(d)(4)

Radionuclide	Critical Organ	pCi Per Liter
Tritium	Total Body	20,000
Strontium-90	Bone Marrow	8

(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 and MRDLs. Minimum 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 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 maximum residual disinfectant level of chlorine dioxide in the water entering the distribution system is 0.8 mg/L.

(4) The maximum residual disinfectant level of free chlorine or chloramine in the water within the distribution system is 4.0 mg/L based on a running annual average.

(g) Turbidity. Systems must meet the turbidity treatment technique requirements as provided in §290.111 of this title (relating to Turbidity).

(1) Until January 1, 2002, the turbidity level of the combined filter effluent must never exceed 5.0 NTU and the turbidity level of the combined filter effluent must be 0.5 NTU or less in at least 95% of the samples tested each month.

(2) Effective January 1, 2002 the turbidity level of the combined filter effluent must never exceed 1.0 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.

(3) Systems are subject to 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 (TTHM and HAA5). The MCLs for TTHM and HAA5 apply to water systems as provided in §290.113 of this title (relating to Disinfection By-products (TTHM and HAA5)). The MCLs for TTHM and HAA5 are:

(1) the MCL for TTHM is 0.080 milligrams/liter; and

(2) the MCL for HAA5 is 0.060 milligrams/liter.

(j) Disinfection by-products other than TTHM and HAA5. The maximum contaminant levels for chlorite and bromate apply to water systems as provided in §290.114 of this title (relating to Disinfection By-products Other than TTHM and HAA5). The MCLs for chlorite and bromate are as follows:

(1) the MCL for chlorite is 1.0 mg/L; and

(2) the MCL for bromate is 0.010 mg/L.

(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) the action level for lead is 0.015 mg/l; and

(2) the action level for copper is 1.3 mg/l.

§290.105. Summary of Secondary Standards.

(a) Summary table purpose. The secondary constituent levels are presented in this section as a reference source. Only the regulatory concentration is shown in these tables. Compliance requirements are given in §290.118 of this title (relating to Secondary Standards).

(b) Secondary standards. The secondary standards apply to all public water systems as provided in §290.118 of this title (relating to Secondary Constituent Levels). The maximum levels for secondary constituents are listed in the following table:

Figure: 30 TAC §290.105(b)

CONTAMINANT	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

§290.106. Inorganic Contaminants.

(a) Applicability. All public water systems are subject to the requirements of this section.

(1) Community and nontransient non-community systems shall comply with the requirements of this section regarding monitoring, reporting, and MCLs for all inorganic contaminants listed in this section.

(2) Transient non-community 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 inorganic contaminants (IOCs). The maximum contaminant levels for inorganic contaminants listed in the following table apply to community and nontransient, non-community water systems. The maximum contaminant levels for nitrate, nitrite, and total nitrate and nitrite also apply to transient non-community water systems.

Figure: 30 TAC §290.106(b)

<u>Contaminant</u>	<u>MCL (mg/l)</u>
Antimony	0.006
Arsenic	0.05
Asbestos	7 million fibers/liter (longer than 10 μ m)
Barium	2.0
Beryllium	0.004
Cadmium	0.005
Chromium	0.1
Cyanide	0.2 (as free Cyanide)
Fluoride	4.0

Mercury	0.002
Nitrate	10.0 (as Nitrogen)
Nitrite	1.0 (as Nitrogen)
Nitrate & Nitrite (Total)	10.0 (as Nitrogen)
Selenium	0.05
Thallium	0.002

(c) Monitoring requirements for inorganic contaminants. Public water systems shall monitor for inorganic contaminants at the locations and specified by the executive director. All monitoring conducted pursuant to 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) 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 point of entry 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 a point of entry that is representative of all sources and during periods of normal operating conditions when water is representative of all sources being used.

(B) Systems shall take all subsequent samples at the same point of entry to the distribution system unless the executive director determines that conditions make another point of entry 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 points of entry 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 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 point of entry 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.

(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 point of entry 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) Monitoring frequency for IOCs except asbestos, nitrate, and nitrite. Community and nontransient non-community public water systems shall monitor for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium at the following frequency.

(A) A public water system shall routinely monitor for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium.

(i) Each groundwater source shall be sampled once every three years at the point of entry to the distribution system.

(ii) Each surface water source shall be sampled annually at the point of entry to the distribution system.

(iii) Each of the sampling frequencies listed in paragraph (3) of this subsection constitute one round of sampling for groundwater and surface water systems, respectively.

(B) 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 were less than the MCL. At least one sample shall have been taken since January 1, 1990.

(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 which 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) The executive director may increase the monitoring frequency for public water systems with sources that exceed the MCL for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, or thallium.

(i) Systems shall sample quarterly beginning in the next quarter after the violation 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 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 water system has taken a minimum of four quarterly samples.

(4) Asbestos monitoring frequency. Community and nontransient non-community 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 which 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.

(5) Nitrate monitoring frequency. All public water systems shall monitor for nitrate at the following frequency.

(A) A public water system shall routinely monitor for nitrate.

(i) All public water systems shall annually sample each ground water source at the point of entry to the distribution system.

(ii) A community or non-transient non-community water system shall sample each surface water source quarterly at the point of entry to the distribution system.

(iii) A transient non-community water system shall annually sample each surface water source at the point of entry to the distribution system.

(B) The executive director may reduce the monitoring frequency for community or non-transient, non-community 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.

(iv) A system that is sampling annually shall return to routine quarterly monitoring if the nitrate concentration in any sample is equal to or greater than 50% of the nitrate MCL.

(C) The executive director may increase the nitrate monitoring frequency for community or non-transient, non-community 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.

(6) 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.

(7) Confirmation sampling. 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 shall collect one additional sample to confirm the results of the initial test.

(i) Confirmation samples must be collected at the same point of entry 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.

(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.

(8) The executive director may require more frequent monitoring than specified in paragraphs (3) - (6) of this subsection.

(d) Analytical requirements for inorganic contaminants. 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 Texas Department of Health (TDH) Bureau of Laboratories.

(e) Reporting requirements for inorganic contaminants. 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 inorganic constituent analyses, measurement, or analysis required to be made by these standards within ten days following the receipt of results for such test, measurement, or analysis.

(f) Compliance determination for inorganic contaminants. Compliance with this section shall be determined using the following criteria.

(1) Compliance with the MCL for each inorganic contaminant 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.

(A) For systems that are sampling annually or less frequently, compliance shall be based on the results of the single sample. If a confirmation sample is collected, the compliance will be based on the average result of the original and confirmation samples.

(B) For systems that are sampling more frequently than annually, compliance is based on the running annual average for each sampling point.

(C) If any one sample would cause the running annual average to be exceeded, then the system is out of compliance immediately.

(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 inorganic contaminant except nitrate and nitrite) specified in subsection (b) of this section commits an MCL violation.

(A) If a confirmation sample is not collected, compliance shall be based on the results of each original sample.

(B) If a confirmation sample is collected, the compliance will be based on the average result of the original and confirmation samples.

(4) Any result below the method detection limit 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.

(g) Public notice for inorganic contaminants. 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 by the next business day 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 inorganic contaminants 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 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.

(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 which is out of compliance.

(h) Best Available Technology (BAT) for inorganic contaminants. Best available technology for treatment of violations of MCLs in subsection (b) of this section are listed in 40 CFR §141.62.

§290.107. Organic Contaminants.

(a) Applicability. All community and nontransient, non-community 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 maximum contaminant levels specified in this section.

(1) The following are MCLs for synthetic organic contaminants (SOCs).

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 X 10 ⁻⁸
2,4,5-TP	0.05
2,4-D	0.07

(2) The following are MCLs for volatile organic contaminants (VOCs).

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	1.0
trans-1,2-Dichloroethylene	0.1
Trichloroethylene	0.005
Vinyl chloride	0.002
Xylenes (total)	10.0

(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 ppm (or equivalent) for acrylamide and 0.01% dosed at 20 ppm (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 pursuant to 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 when water representative of all sources used by the system is being used.

(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 treating only groundwater shall sample for SOC's at every point of entry to the distribution system which is representative of each well after treatment. Subsequent samples must be taken at the same point of entry to the distribution system unless a change in conditions makes another point of entry to the distribution system more representative of each source or treatment plant. The executive director must approve any change in sampling location.

(ii) Systems using surface water and systems treating groundwater under the direct influence of surface water shall sample for SOC's at points in the distribution system that are representative of each source or at each entry point to the distribution system. Subsequent samples must be taken at the same points of entry to the distribution system unless a change in conditions makes another point of entry to the distribution system more representative of each source or treatment plant. The executive director must approve any change in sampling location.

(B) 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 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 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.

(C) Increased SOC monitoring. The executive director may change the monitoring frequency for SOCs.

(i) Systems which violate the SOC MCL's of subsection (b)(1) of this section as determined by subsection (f) of this section must monitor 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 which 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 point of entry to the distribution system at which a detection occurs.

(II) After a groundwater system collects a minimum of two consecutive quarterly samples, the executive director may decrease the quarterly monitoring requirement specified in subclause (I) of this clause, if the system is reliably and consistently below the MCL.

(III) After a surface water system or system treating groundwater under the direct influence of surface water collects a minimum of four consecutive quarterly samples, the executive director may decrease the quarterly monitoring requirement specified in subclause (I) of this clause, if the system is reliably and consistently below the MCL.

(IV) After the executive director determines that a system is reliably and consistently below the MCL, the executive director may allow the system to monitor annually. Systems which monitor annually must monitor during the quarter that previously yielded the highest analytical result.

(V) Systems which 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 by subsection (f) of this section. The executive director has discretion to delete results of obvious sampling errors from this calculation.

(D) Waivers for SOC monitoring. The executive director may grant a waiver to reduce the SOC monitoring frequency from the monitoring frequency requirements of subsection (c)(1)(B) of this section, 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 PCBs in equipment used in the production, storage, or distribution of water (i.e., PCBs used in pumps, transformers, etc.).

(E) 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 points of entry 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, in the composite sample, a detection of one or more SOC contaminants listed in subsection (b)(1) of this section occurs, then a follow-up sample must be taken from each point of entry 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 point of entry 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 points of entry to the distribution system within a single system.

(F) Initial SOC monitoring. If monitoring data are generally consistent with the requirements of this subsection (c)(1) of this section, then the executive director may allow systems to use that data to satisfy the monitoring requirement for the initial compliance period.

(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 that use only groundwater shall sample for VOCs at every entry point to the distribution system which is representative of each well after treatment. Subsequent samples must be taken at the same point of entry to the distribution system unless a change in conditions makes another point of entry to the distribution system more representative of each source or treatment plant. The executive director must approve any change in sampling location.

(ii) Surface water systems, systems using groundwater under the direct influence of surface water, and systems blending groundwater and surface water shall sample for VOCs at points in the distribution system that are representative of each source or at each point of entry to the distribution system. Subsequent samples must be taken at the same points of entry to the distribution system unless a change in conditions makes another point of entry to the distribution system more representative of each source or treatment plant. The executive director must approve any change in sampling location.

(B) 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 by December 31, 1992, 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 groundwater system which does not detect a VOC contaminant listed in subsection (b)(2) of this section may be granted a waiver from the annual or triannual requirements of subsection (c)(2)(B)(ii) and (c)(2)(B)(iii) of this section after completing the initial monitoring. For the purposes of this section, detection is defined as ≥ 0.0005 mg/l. 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.

(C) Increased VOC monitoring. The executive director may change the monitoring frequency for VOCs.

(i) Systems which violate the VOC MCLs of subsection (b)(2) of this section, as determined by subsection (f) of this section, must monitor 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 point of entry to the distribution system which resulted in a detection;

(II) the executive director may decrease the quarterly monitoring requirement specified in subsection (c)(2)(C)(iii)(I) of this section provided it has determined that the system is reliably and consistently below the maximum contaminant level. 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 which monitor annually must monitor during the quarter which 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 subsection (c)(2)(D) of this section; and

(V) Groundwater systems which 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 point of entry 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.).

(D) 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 point of entry 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 which 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 subsection (c)(2)(B)(ii) of this section 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).

(E) 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 five points of entry 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 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 point of entry to the distribution system included in the composite.

(ii) If duplicates of the original sample taken from each point of entry to the distribution system used in the composite are available, the system may use these instead of resampling. The duplicate must be analyzed and the results reported to the public drinking water program within 14 days of collection.

(iii) Compositing may only be permitted by the executive director at points of entry to the distribution system within a single system.

(iv) Procedures for compositing VOC samples are as stated in 40 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 TDH Bureau of Laboratories.

(e) Reporting requirements for organic contaminants. Any owner or operator of a public water system subject to the provisions of this section is required to report to the public drinking water program the results of any test, measurement, or analysis required to be made by this section within ten days following receipt of the results of such test, measurement, or analysis.

(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 point of entry to the distribution system.

(1) For systems which are sampling more than once a year, compliance is determined by a running annual average of all samples taken at each point of entry to the distribution system. If the annual average at any point of entry to the distribution system is greater than the MCL, the system commits an MCL violation. If the initial sample or a subsequent sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any samples below the detection limit shall be considered to be zero for purposes of calculating the annual average.

(2) For systems which are sampling once a year or less, compliance is based on a single sample. If the level of a contaminant at any point of entry to the distribution system is greater

than the MCL, the system commits an MCL violation. If a confirmation sample is required by the executive director, the determination of compliance will be based on the average of the two samples.

(3) The executive director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by their sanctioned representatives and agencies.

(g) Public notification requirements for organic contaminants. A public water system that violates the requirements of this section must notify the public drinking water program 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 which is out of compliance.

(1) A system that violates an MCL given in subsection (b) of this section, shall report to the public drinking water program and notify the public as provided under §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 (relating to Public Notification).

(h) Best available technology (BAT) 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 Permitting and Resource Management Division, Texas Natural Resource Conservation Commission, P.O. Box 13087, Austin, Texas 78711-3087.

§290.108. Radiological Sampling and Analytical Requirements.

(a) Applicability. All community and nontransient, noncommunity water systems shall comply with the requirements of this section regarding radiological contaminants. Public water systems treating groundwater under the direct influence of surface water must comply with the radiological requirements for surface water systems.

(b) Maximum contaminant levels (MCLs). The concentration of radiological contaminants in the water entering the distribution system shall not exceed the following maximum contaminant levels.

(1) MCLs for radium-226, radium-228 and gross alpha particle radioactivity for community systems are as follows:

(A) the MCL for combined radium-226 and radium-228 is 5 pCi/l; and

(B) the MCL for gross alpha particle activity (including radium-226 but excluding radon and uranium) is 15 pCi/l.

(2) Maximum contaminant levels for beta particle and photon radioactivity from man-made radionuclides in drinking water in community water systems are as follows:

(A) The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than four millirem (mrem)/year.

(B) Except for the radionuclides listed in Table A, the concentration of man-made radionuclides causing four mrem total body or organ dose equivalents shall be calculated on the basis of a two-liter-per-day drinking water intake using the 168 hour data listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," NBS Handbook 69 as amended August 1963, U.S. Department of Commerce. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed four mrem/year.

Figure: 30 TAC §290.108(b)(2)(B)

**Table A - Average annual concentrations assumed to produce
a total body or organ dose of four mrem/year.**

Radionuclide	Critical Organ	pCi Per Liter
Tritium	Total Body	20,000
Strontium-90	Bone Marrow	8

(c) Monitoring requirements. Public water systems shall measure the concentration of radiochemicals at locations and frequencies specified in the system's monitoring plan. All samples must be collected during normal operating conditions.

(1) The monitoring frequency requirements for gross alpha particle activity, radium-226 and radium-228 are as follows. Public water systems shall monitor at least once every four years following the procedure required by subsection (f)(1) of this section. At the discretion of the executive director, when an annual record taken in conformance with subsection (f)(1) of this section has established that the average annual concentration is less than one-half the maximum contaminant levels established by subsection (b) of this section, analysis of a single sample may be substituted for the quarterly sampling procedure required by subsection (f)(1) of this section.

(A) More frequent monitoring shall be conducted when required by the executive director in the vicinity of mining or other operations which 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 which may increase the concentration of radioactivity in the finished water.

(B) A public water system shall monitor in conformance with subsection (c)(1)(A) of this section within one year of the introduction of a new water source for a community water system.

(C) A community water system using two or more sources having different concentrations of radioactivity shall monitor the source of water, in addition to water from a free-flowing tap, when required by the executive director.

(D) Monitoring for compliance with subsection (b) of this section after the initial period need not include radium-228 provided that the average concentration of radium-228 has been assayed at least once using the quarterly sampling procedure required by this subsection.

(E) Public water systems shall conduct annual monitoring of any community water system in which the radium 226 concentration exceeds three pCi/l when required by the executive director.

(2) The monitoring frequency requirements for man-made radioactivity in community water systems are as follows:

(A) Systems using surface water sources and serving more than 100,000 persons and such other community water systems as are designated by the executive director shall be monitored for compliance with the subsection (b) of this section by analysis of four quarterly samples. Compliance with subsection (b) of this section may be assumed without further analysis if the average annual concentration of gross beta particle activity is less than 50 pCi/l and if the average annual concentrations of tritium and strontium-90 are less than those listed in Table A of subsection (b)(2)(B) of this section, provided that if both radionuclides are present, the sum of their annual dose equivalents to bone marrow shall not exceed four mrem/year.

(i) If the gross beta particle activity exceeds 50 pCi/l, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate

organ and total body doses shall be calculated to determine compliance with subsection (b) of this section.

(ii) Public water systems shall conduct additional monitoring as required by the executive director to determine the concentration of man-made radioactivity in principal watersheds designated by the executive director.

(iii) At the discretion of the executive director, public water systems utilizing only groundwater may be required to monitor for man-made radioactivity.

(B) After the initial analysis required by subsection (c)(2)(A) of this section, public water systems shall monitor at least every four years following the procedure given in subsection (c)(2)(A) of this section.

(C) A community water system designated by the executive director as utilizing waters contaminated by effluents from nuclear facilities shall initiate quarterly monitoring for gross beta particle and iodine-131 radioactivity and annual monitoring for strontium-90 and tritium.

(i) Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples. If the gross beta particle activity in a sample exceeds 15 pCi/l, the same or an equivalent sample shall be analyzed for strontium-89 and cesium-134. If the gross beta particle activity exceeds 50 pCi/l, an analysis of the sample must be performed to identify the major

radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with subsection (b) of this section.

(ii) For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. When iodine-131 is identified in the finished water more frequent monitoring shall be conducted as required by the executive director.

(iii) Annual monitoring for strontium-90 and tritium shall be conducted by the analysis of four quarterly samples.

(iv) The executive director may allow the substitution of environmental surveillance data taken in conjunction with a nuclear facility for direct monitoring of man-made radioactivity by the public water system where the executive director determines such data is applicable to a particular community water system.

(d) Analytical requirements for radiological contaminants. Analytical procedures shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for radiological contaminants shall be performed at a laboratory certified by the TDH Bureau of Laboratories.

(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 to be made by this section within ten days following receipt of the results of such test, measurement, or analysis.

(f) Compliance determination. Compliance with the requirements of this section shall be determined as follows.

(1) If the average annual MCL for gross alpha particle activity or total radium as set forth in subsection (b) of this section is exceeded, the system has committed a MCL violation. Monitoring at quarterly intervals shall be continued until the annual average concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective. Compliance with subsection (b) of this section shall be based on the analysis or analyses of four quarterly samples.

(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 five pCi/l at a confidence level of 95% (1.65θ where θ is the standard deviation of the net counting rate of the sample).

(B) When the gross alpha particle activity exceeds five pCi/l, the same or an equivalent sample shall be analyzed for radium-226. If the concentration of radium-226 exceeds three pCi/l the same or an equivalent sample shall be analyzed for radium-228.

(2) If the average annual maximum contaminant level for man-made radioactivity set forth in subsection (b) of this section is exceeded, the system has committed a MCL violation.

Monitoring at monthly intervals shall be continued until the concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

(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.

(g) Public notification. A public water system that violates the requirements of this subsection must notify the public drinking water program and the system's customers.

(1) A public water system that violates the MCL for gross alpha particle activity or total radium shall give notice to the public drinking water program 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 radioactivity shall give notice to the public drinking water program and to the public as required by §290.122(b) of this title.

(3) 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.

§290.109. 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 for microbial contaminants. The MCL for microbial contaminants is based on the presence or absence of total coliform bacteria in a sample.

(1) For a system which collects at least 40 bacteriological samples per month, the MCL is 5.0% total coliform-positive samples, of the samples collected during the month.

(2) For a system which collects fewer than 40 samples/month, the MCL is one total coliform-positive sample, of the samples collected during the month.

(c) Monitoring requirements for microbial contaminants. Public water systems shall collect samples for total coliform and for fecal coliform or *Escherichia coli*. 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 bacteriological samples at active service connections which are representative of water throughout the distribution system. Other sampling sites may be used if located adjacent to service connections.

(B) Public water systems shall monitor for microbial contaminants at locations specified in the system's monitoring plan.

(2) Routine microbial sampling frequency. Public water systems must sample for microbiological contaminants at the following frequency.

(A) Community and noncommunity public water systems must collect routine bacteriological 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)

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 samples at regular time intervals throughout the month.

(C) A public water system which uses only purchased water or groundwater not under the direct influence of surface water and serves more than 4,900 persons must collect 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 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 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 samples during the next month the system provides water to the public.

(3) Repeat microbial monitoring requirements. Systems shall conduct repeat monitoring if one or more of the routine samples is found to contain coliform organisms.

(A) If a routine sample is total coliform-positive, the public water system must collect a set of repeat 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 sample per month must collect no fewer than three repeat samples for each total coliform-positive sample found.

(ii) A system which collects one routine sample per month must collect no fewer than four repeat samples for each total coliform-positive sample found.

(B) The system must collect all repeat samples on the same day, except that 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 total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. If a 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) Sample invalidation. The executive director may invalidate a total coliform-positive sample if one of the following conditions is met.

(A) The executive director may invalidate a sample if the laboratory establishes 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 establishes that the sample was unsuitable for analysis.

(E) If a sample is invalidated, 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 coliforms. The system must continue to resample within 24 hours and have the samples analyzed until it obtains a valid result.

(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 *E. coli* bacteria are present. If fecal coliforms or *E. coli* are present, the system must notify the public drinking water program by the end of the day in accordance with subsection (g) of this section.

(d) Analytical 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 TDH Bureau of Laboratories.

(e) Reporting requirements for microbial contaminants. Any owner or operator of a public water system subject to the provisions of this section is required to report to the public drinking water program the results of any test, measurement, or analysis required to be made by this section within ten days following receipt of the results of such test, measurement, or analysis.

(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 sample is fecal coliform-positive or *Escherichia coli*-positive; or

(B) A total coliform-positive repeat sample follows a fecal coliform-positive or *Escherichia coli*-positive routine sample.

(2) A system that collects at least 40 bacteriological 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 *Escherichia coli*-positive.

(3) A system that collects fewer than 40 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 *Escherichia coli*-positive.

(4) A public water system that fails to provide the required number of suitable samples commits a monitoring violation.

(5) A public water system that fails to report the results of the monitoring tests required by this section commits a reporting violation.

(6) Results of all routine and repeat samples not invalidated by the executive director must be included in determining compliance with the MCL for total coliforms.

(7) Samples invalidated by the executive director shall not be included in determining compliance with the MCL for total coliforms.

(8) 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 requirements of §290.46(s)(3) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems) and §290.122(a) of this title.

(2) A public water system that has fecal coliforms or *E. coli* present must notify the public drinking water program 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 public drinking water program's office is closed, in which case the system must notify the public drinking water program before the end of the next business day.

(3) A public water system which commits an MCL violation must report the violation to the public drinking water program 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.

(4) A public water system which has failed to comply with a coliform monitoring requirement must report the monitoring violation to the public drinking water program 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 concentrations (MRDLs) provided in this section. The disinfection process at a system treating surface water or groundwater under the direct influence of surface water shall meet the treatment technique requirements provided in this section.

(1) The disinfection protocols used by public water systems with surface water sources or groundwater sources that are under the direct influence of surface water must ensure that the total treatment process achieves at least 99.9% (3-log) inactivation or removal of *Giardia lamblia* cysts and at least 99.99% (4-log) inactivation or removal 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.

(A) The disinfection process at a surface water treatment plant that uses coagulation, flocculation, sedimentation, and filtration facilities shall provide at least a 0.5-log inactivation of *Giardia lamblia* cysts and a 2-log inactivation of viruses.

(B) The disinfection process at a surface water treatment plant or a plant treating groundwater under the direct influence of surface water that uses microfiltration or ultrafiltration processes shall provide at least a 4-log inactivation of viruses.

(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 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.

(A) Effective January 1, 2002, public water systems that serve at least 10,000 people and use surface water sources or groundwater sources that are under the influence of surface water must comply with the MRDL for chlorine and chloramine.

(B) Effective January 1, 2004, systems that serve fewer than 10,000 people and those that serve at least 10,000 people and use groundwater sources must comply with the MRDL for chlorine and chloramine.

(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 sources or groundwater sources under the direct influence of surface water must verify that they meet the disinfection requirements of subsection (b)(1) of this section.

(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.

(2) 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)(2)(B)(i)

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.

(3) 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.

(4) 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.

(5) Public water systems shall monitor the disinfectant residual at various locations throughout the distribution system.

(A) Public water systems must conduct daily disinfectant residual tests at representative locations in the distribution system unless they use groundwater or purchased water sources only and serve fewer than 250 connections or 750 people daily.

(B) Public water systems which use groundwater or purchased water sources only and serve fewer than 250 connections or 750 people daily must test the disinfectant residual at representative locations in the distribution system at least once every seven days.

(C) The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as bacteriological samples are 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 pH analysis must be conducted using a pH meter with a minimum accuracy of plus or minus 0.1 pH units.

(2) 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.

(3) 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) DPD Ferrous titration; or

(C) DPD colorimetric.

(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)

(4) 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.

(5) The chlorine dioxide residual must be measured to a minimum accuracy of plus or minus 0.05 mg/L using an amperometric titrator with platinum-platinum electrodes.

(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 public drinking water program 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 public drinking water program at least by the end of the next business day.

(2) Public water systems that use surface water sources or groundwater sources under the direct influence of surface water must submit a Monthly Operating Report for Surface Water Treatment Plants each month. Until January 1, 2001, systems must submit TNRCC Form 0102A. After January 1, 2001, systems must submit TNRCC Form 00102.

(3) Public water systems that use chlorine dioxide must submit a Monthly Report for Chlorine Dioxide Installations each month.

(4) Effective January 1, 2004, public water systems that use purchased water or groundwater sources only must submit a Quarterly Distribution Report for Public Water Systems each quarter.

(5) Monthly and quarterly reports required by this section must be submitted to the Texas Natural Resource Conservation Commission, Water Permitting and Resource Management Division, P.O. Box 13087, MC 155, 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)(1) or (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)(C) and (c)(3)(C) 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)(4) 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)

$$V = \frac{b}{a} \times 100$$

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.

(g) Public notification requirements. The owner or operator of a public water system that violates the requirements of this section must notify the public drinking water program 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 public drinking water program by the end of the next business day 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 (relating to Public Notification).

(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)(1) or (b)(2) of this section shall notify the public drinking water program 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 public drinking water program 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. Turbidity.

(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. A public water system that uses groundwater under the direct influence of surface water must comply with the requirements of this section by 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.

(b) Treatment technique requirements for turbidity. The filtration techniques used by public water systems treating surface water or groundwater under the direct influence of surface water must ensure the system meets the following treatment technique requirements and criteria.

(1) Through December 31, 2001, the treatment process used by public water systems treating surface water or groundwater under the direct influence of surface water must achieve at least a 3-log removal or inactivation of *Giardia lamblia* 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.

(A) Treatment plants using conventional media filtration must achieve the following turbidity levels.

(i) The turbidity level of the combined filter effluent must never exceed 5.0 NTU.

(ii) The turbidity level of the combined filter effluent must be 0.5 NTU or less in at least 95% of the samples tested each month. The executive director may allow a turbidity level of up to 1.0 NTU in at least 95% of the samples if the system can achieve the required 3-log removal or inactivation of *Giardia lamblia* cysts and 4-log removal or inactivation of viruses at that higher turbidity level.

(B) Membrane facilities must meet site-specific performance standards approved by the executive director.

(2) Beginning January 1, 2002, the treatment process must achieve at least a 2-log removal of *Cryptosporidium* oocysts, a 3-log removal or inactivation of *Giardia lamblia* 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.

(A) Treatment plants using conventional media filtration must achieve the following turbidity levels.

(i) The turbidity level of the combined filter effluent must never exceed 1.0 NTU.

(ii) 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.

(B) Membrane facilities must meet site-specific performance standards approved by the executive director.

(C) The executive director may extend the compliance date for systems serving fewer than 10,000 people.

(i) The compliance date may not be extended beyond January 1, 2004.

(ii) During any extension that is granted, the turbidity level of the combined filter effluent must meet the requirements of subsection (b)(1) of this section.

(3) The filtration techniques used by public water systems that serve 10,000 people or more and treat surface water or groundwater under the direct influence of surface water must ensure the system meets the following criteria.

(A) Beginning January 1, 2002, the turbidity from each individual filter should not exceed 0.5 NTU at four hours after the individual filter is returned to service after backwash or shut down.

(B) Beginning January 1, 2002, the turbidity from each individual filter should never exceed 1.0 NTU.

(c) Monitoring requirements for turbidity. Public water systems with surface water sources or groundwater sources that are under the direct influence of surface water shall monitor the performance of their filtration facilities.

(1) Public water systems that serve fewer than 500 people must monitor the turbidity of the combined filter effluent at least once each day that the system serves water to the public.

(2) Public water systems that serve 500 people or more must monitor the turbidity of the combined filter effluent at least every four hours that the system serves water to the public.

(3) Beginning January 1, 2002, public water systems that serve 10,000 people or more must continuously monitor the filtered water turbidity at the effluent of each individual filter and record the turbidity value every 15 minutes.

(4) Beginning January 1, 2002, public water systems that serve fewer than 10,000 people and use surface water or groundwater under the direct influence of surface water must measure and record the filtered water turbidity level at the effluent of each individual filter at least once each day that the plant is in operation.

(5) Special monitoring requirements. Beginning January 1, 2002, public water systems which serve 10,000 people or more and fail to meet the turbidity criteria specified in subsection (b)(3) of this section must conduct additional monitoring. The executive director can waive these special monitoring requirements for systems that have a corrective action schedule approved by the executive director.

(A) Each time a filter exceeds either of the filtered water turbidity levels specified in subsection (b)(3) of this section for two consecutive 15-minute readings, the public water system must either identify the cause of the exceedance or complete a Filter Profile Report on the filter within seven days of the exceedance.

(B) Each time a filter exceeds the filtered turbidity level specified in subsection (b)(3)(B) 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 exceedance.

(C) 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 within 90 days of the exceedance.

(d) Analytical requirements for turbidity. All monitoring required by this section 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).

(1) Turbidity must be measured with turbidimeters that use nephelometric methods or Great Lakes Instruments Method 2.

(2) Monitoring of combined filter effluent may be conducted by either continuously monitoring turbidity levels with an on-line turbidimeter or measuring the turbidity level in grab samples with a benchtop turbidimeter.

(3) Beginning January 1, 2002, systems serving 10,000 or more people must monitor the turbidity of the water produced by individual filters with a continuous, on-line turbidimeter and a continuous recorder.

(A) Continuous individual filter turbidity may be recorded electronically by a SCADA system or on a strip chart. Circular strip charts, if used, must be set to record no more than one day's readings per chart.

(B) If there is a failure in the continuous turbidity monitoring equipment, 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.

(4) Beginning January 1, 2002, systems serving fewer than 10,000 people must monitor the turbidity of the water produced by individual filters by continuously monitoring turbidity levels with an on-line turbidimeter or measuring the turbidity level in grab samples with a benchtop turbidimeter.

(e) Reporting requirements for turbidity. Public water systems shall properly complete and submit periodic reports to demonstrate compliance with this section.

(1) A public water system that has a turbidity level exceeding 5.0 NTU in the combined filter effluent shall notify the public drinking water program by the next business day.

(2) Public water systems which use surface water sources or groundwater sources under the direct influence of surface water, must submit a Monthly Operating Report for Surface Water Treatment Plants each month. Until January 1, 2001, systems must submit TNRCC Form 0102A. After January 1, 2001, systems must submit TNRCC Form 00102.

(3) Public water systems that must complete the additional monitoring required by subsection (c)(5)(A) of this section must submit a Filter Profile Report for Individual Filters with their Monthly Operating Report for Surface Water Treatment Plants.

(4) Public water systems that must complete the additional monitoring required by subsection (c)(5)(B) of this section must submit a Filter Assessment Report for Individual Filters with their Monthly Operating Report for Surface Water Treatment Plants.

(5) Public water systems that must complete the additional monitoring required by subsection (c)(5)(C) of this section must submit a Request for Compliance CPE with their Monthly Operating Report for Surface Water Treatment Plants.

(6) Periodic reports required by this section must be submitted to the Texas Natural Resource Conservation Commission, Water Permitting and Resource Management 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.

(f) Compliance determination. Compliance with the requirements of this section shall be determined using the following criteria.

(1) A public water system that fails to conduct the combined filter effluent or individual filter monitoring tests required by this section commits a monitoring violation.

(2) A public water system that fails to report the results of the combined filter effluent or individual filter monitoring tests required by this section commits a reporting violation.

(3) Beginning on January 1, 2002, a public water system that serves 10,000 or more people and fails to submit the reports required by subsection (e)(3)-(5) of this section commits a reporting violation.

(4) A public water system that has a turbidity level exceeding 5.0 NTU in the combined filter effluent commits an acute treatment technique violation.

(5) Until December 31, 2001, a public water system that violates the requirements of subsection (b)(1)(A)(ii) of this section commits a treatment technique violation.

(6) Beginning January 1, 2002, a public water system that violates the requirements of subsection (b)(2)(A) of this section commits a treatment technique violation.

(7) Beginning January 1, 2002, a system that fails to correct the performance-limiting factors identified in a CPE conducted pursuant to the requirements of subsection (c)(5)(C) of this section commits a violation.

(g) Public notification for turbidity. The owner or operator of a public water system that violates the requirements of this section must notify the public drinking water program and the people served by the system.

(1) A public water system that has a turbidity level exceeding 5.0 NTU in the combined filter effluent shall notify the public drinking water program by the next business day and the water system customers of the acute violation in accordance with the requirements of §290.46(s)(4) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems) and §290.122(a) of this title (relating to Public Notification).

(2) A public water system that fails to meet the treatment technique requirements of subsection (b)(1) or (2) of this section shall notify the public drinking water program 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.

(3) 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.

§290.112. 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.

(1) Systems serving 10,000 or more people must comply with the monitoring and reporting requirements beginning January 1, 2001. Systems serving fewer than 10,000 people must comply with the monitoring and reporting requirements beginning January 1, 2003.

(2) Systems serving 10,000 or more people must comply with the treatment technique requirements for TOC beginning January 1, 2002. Systems serving fewer than 10,000 people must comply with the treatment technique requirements for TOC beginning January 1, 2004.

(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 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 mg/L) for the specified source water TOC.

Figure: 30 TAC §290.112(b)(1)

Step 1 TOC Removal Requirements

Source-water TOC (mg/L)	Source-water alkalinity (mg/L as CaCO ₃)		
	Less than or Equal to...		
	0 - 60	≥60 - 120	≥120
≥ 2.0 - 4.0	35.0% Removal	25.0% Removal	15.0% Removal
≥ 4.0 - 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 CaCO₃), calculated quarterly as a running annual average; and the TTHM and 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 SUVA, prior to any treatment, measured monthly, is less than or equal to 2.0 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 (b)(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 public drinking water program 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 public drinking water program 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. Within one hour of 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 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. 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. 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.

(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 Texas Natural Resource Conservation Commission, Water Permitting and Resource Management 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.

(2) Public water systems must submit a Monthly Operational Report for Total Organic Carbon Control each month.

(A) Systems treating surface water or groundwater under the direct influence of surface water and serving 10,000 or more people must comply with these reporting requirements starting January 1, 2001.

(B) Systems treating surface water or groundwater under the direct influence of surface water must and serving less than 10,000 people must comply with these reporting requirements starting January 1, 2003.

(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 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 (relating to Disinfection By-products (TTHM and HAA5)), 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) If the system meets alternative compliance criterion Number 9, subsection (b)(2)(I) 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 Disinfection By-products (TTHM and HAA5)).

(G) 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 $(1 - \text{treated water TOC}/\text{source water TOC})$. 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 CaCO_3) 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.

(g) Public Notification. A public water system that violates the treatment technique requirements of this section must notify the public drinking water program and the system's customers.

(1) A public water system that commits a TOC treatment technique violation shall notify the public drinking water program 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. 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) Effective January 1, 2002, community and nontransient, noncommunity public water systems that serve at least 10,000 people and use surface water sources or groundwater sources that are under the direct influence of surface water must comply with the maximum contaminant levels (MCLs) for total trihalomethanes (TTHM) and haloacetic acids (five) (HAA5).

(2) Effective January 1, 2004, community and nontransient, noncommunity public water systems that serve fewer than 10,000 persons and those that serve at least 10,000 persons and use groundwater sources must comply with the MCL for TTHM and HAA5.

(3) Until January 1, 2004, public water systems using groundwater as a supply source and serving at least 10,000 people will be regulated in accordance with §290.115 of this title (relating to Transition Rule for Disinfection By-products).

(4) Until January 1, 2002, public water systems using surface water sources or groundwater sources that are under the direct influence of surface water must comply with the requirements of §290.115 of this title (relating to Transition Rule for Disinfection By-products).

(b) Maximum contaminant level 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.

(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 "Routine Monitoring Frequency and Locations for TTHM and HAA5."

Figure: 30 TAC §290.113(c)(3)

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 surface water system serving at least 10,000 persons	four water samples per quarter per treatment plant	At least 25 % of all samples collected each quarter at locations representing maximum residence time. Remaining samples taken at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods 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 ground water 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 .
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System using only ground water 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.
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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 “Reduced Monitoring Frequency and Locations for TTHM and HAA5.”

Figure: 30 TAC §290.113(c)(4)

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	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

a source water annual average
TOC level, before any
treatment, less than or equal to
4.0 mg/L

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	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.
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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.
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System using only groundwater not under direct influence of surface water using chemical disinfectant and serving at least	TTHM annual average less than or equal to 0.040 mg/L and HAA5 annual average less	one sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water
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10,000 persons	than or equal to 0.030mg/L	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.

(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 TDH Bureau of Laboratories.

(e) Reporting requirements for TTHM and HAA5. Any owner or operator of a public water system subject to the provisions of this section is required to report to the public drinking water program 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 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.

(g) Public Notification Requirements for TTHM and HAA5. A public water system that violates the requirements of this section of must notify the public drinking water program and the system's customers.

(1) A system that violates an MCL given in subsection (b)(1) or (2) of this section shall report to the public drinking water program within 30 days after receiving analytical results and notify the public as provided under §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. Disinfection By-products Other than TTHM and HAA5.

(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 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.

(iv) Public water systems that serve fewer than 10,000 people are exempt from the requirements of subsection (a) of this section until January 1, 2004 if the public water system signs and complies with the requirements set forth by the executive director in a bilateral agreement.

(v) Public water systems that serve at least 10,000 people are exempt from the requirements of subsection (a) of this section until January 1, 2002 if the public water system signs and complies with the requirements set forth by the executive director in a bilateral agreement.

(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) Before January 1, 2002, systems using chlorine dioxide in accordance with a bilateral compliance agreement with the executive director must have the chlorite concentration of the water within the distribution system analyzed using ion chromatography at a facility approved by the executive director.

(C) Beginning January 1, 2002, the chlorite concentration of the water within the distribution system must be analyzed using ion chromatography at a facility certified by the TDH Bureau of Laboratories.

(4) Reporting requirements for chlorite. Public water systems using chlorine dioxide shall properly complete and submit periodic report to demonstrate compliance with this subsection.

(A) Systems using chlorine dioxide must submit a Chlorine Dioxide Monthly Operating Report within ten days after the end of each month. The report must be submitted to the Texas Natural Resource Conservation Commission, Water Permitting and Resource Management Division, P.O. Box 13087, MC 155, Austin, Texas 78711-3087.

(B) The results of all samples collected at points designated in the monitoring plan must be reported.

(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.

(6) Public notification requirements for chlorite. A public water system that violates the requirements of this subsection must notify the public drinking water program and the system's customers.

(A) A public water system that violates the MCL for chlorite shall notify the public drinking water program 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 (relating to Analytical Procedures). Testing for bromate shall be performed at a laboratory certified by the TDH Bureau of Laboratories.

(4) 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.

(i) All samples collected and analyzed in accordance with the monitoring plan must be included when calculating each monthly average and the running annual average, even if the total number of samples collected during the month is greater than the minimum required.

(ii) If a public water system fails to complete 12 consecutive months of monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

(iii) If, during the first year of bromate monitoring, any individual quarter's average will cause the running annual average of that plant to exceed the MCL, the system is out of compliance at the end of that quarter.

(5) 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 public drinking water program.

(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 (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.

§290.115. Transition Rule for Disinfection By-products.

(a) Applicability. All community and non-transient noncommunity public water systems that serve at least 10,000 people must comply with the requirements of this section.

(1) A public water system that uses groundwater sources and serves at least 10,000 people shall comply with this section until January 1, 2004.

(2) A public water system that uses surface water sources or groundwater sources that are under the direct influence of surface water and serves at least 10,000 people shall comply with this section until January 1, 2002.

(b) The maximum contaminant level (MCL) for total trihalomethanes shall be 0.10 milligrams/liter. The MCL shall apply only to those systems which serve a population of 10,000 or more individuals.

(c) Sampling and analytical requirements for total trihalomethanes:

(1) For the purpose of this section, 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. All samples taken within one sampling period shall be collected within a 24-hour period.

(2) For all community water systems utilizing surface water sources in whole or in part, and for all water systems utilizing only groundwater sources that have not been determined to qualify for the reduced monitoring requirements of paragraph (4) of this subsection, analyses for total trihalomethanes shall be performed on at least four samples of water per quarter from each treatment plant used by the system. At least 25% of the samples shall be taken at locations within the distribution system reflecting the maximum residence time of the water in the system. The remaining 75% shall be taken at representative locations in the distribution system, taking into account number of persons served, different sources of water, and different treatment methods employed. The results of all analyses per quarter shall be arithmetically averaged and reported to the public drinking water program within 30 days of the system's receipt of such results. All samples collected shall be used in computing the average, unless the analytical results are invalidated for technical reasons.

(3) Upon the written request of a community water system, the monitoring frequency required by paragraph (2) of this subsection may be reduced by the public drinking water program to a minimum of one sample analyzed for TTHMs per quarter taken at a point in the distribution system

reflecting the maximum residence time of the water in the system, upon a written determination by the public drinking water program that the data from at least one year of monitoring in accordance with paragraph (2) of this subsection and local conditions demonstrate that total trihalomethane concentrations will be consistently below the maximum contaminant level.

(A) If at any time during which the reduced monitoring frequency prescribed under this paragraph applies, the results from any analysis exceed 0.10 milligrams/liter of TTHMs and such results are confirmed by at least one check sample taken promptly after such results are obtained, or if the system makes any significant change to its source of water or treatment program, the system shall immediately begin monitoring in accordance with the requirements of paragraph (2) of this subsection.

(B) If a system is required to begin monitoring in accordance with paragraph (2) of this subsection, such monitoring shall continue for at least one year before a reduction in monitoring frequency may be considered.

(4) Upon the written request to the public drinking water program, a community water system utilizing only groundwater sources may seek to have the monitoring frequency reduced to a minimum of one sample for maximum TTHM potential per year taken at a point in the distribution system reflecting maximum residence time of the water in the system. The system shall submit to the public drinking water program the results of at least one sample analyzed for maximum TTHM potential taken at a point in the distribution system reflecting the maximum residence time of the water in the system. The system's monitoring frequency may only be reduced upon a written determination

by the public drinking water program that, based upon the data submitted by the system, the system has a maximum TTHM potential of less than 0.10 milligrams/liter and that, based upon an assessment of the local conditions of the system, the system is not likely to approach or exceed the maximum contaminant level for TTHM's. The results of all analyses shall be reported to the public drinking water program within 30 days of the system's receipt of such results. All samples collected shall be used for determining whether the system must comply with the monitoring requirements of paragraph (2) of this subsection, unless the analytical results are invalidated for technical reasons.

(A) If at any time during which the reduced monitoring frequency prescribed under this paragraph is in effect, the result from any analysis taken by the system for the maximum TTHM potential is equal to or greater than 0.10 milligrams/liter, and such results are confirmed by at least one check sample taken promptly after such results are received, the system shall begin immediately to monitor in accordance with the requirements of paragraph (2) of this subsection.

(B) If it becomes necessary to begin monitoring in accordance with paragraph (2) of this subsection, such monitoring shall continue for at least one year before the monitoring frequency may be reduced.

(C) In the event of any significant change to the system's raw water or treatment program, the system shall immediately analyze an additional sample for maximum TTHM potential taken at a point in the distribution system reflecting the maximum residence time of the water in the system for the purpose of determining whether the system must comply with the monitoring requirement of paragraph (2) of this subsection.

(5) Compliance with the MCL of 0.10 milligrams/liter for total trihalomethanes shall be determined based on a running annual average of quarterly samples collected by the system as prescribed in paragraph (2) of this subsection. If the average of samples covering any 12-month period exceeds the maximum contaminant level, the public water system shall report to the public drinking water program within 30 days and notify the public as required under §290.122(b) of this title (relating to Public Notification). Monitoring after public notification shall be at a frequency designated by the public drinking water program and shall continue until a monitoring schedule as a condition of a variance, exemption, or enforcement action shall become effective.

(6) Before a community water system makes any significant modification to its existing treatment process for the purpose of achieving compliance with this subsection, the system must submit and obtain approval from the public drinking water program of a detailed plan setting forth its proposed modifications and those safeguards that it will implement to ensure that the bacteriological quality of the drinking water served by such system will not be adversely affected by such modifications.

(7) All analyses for determining compliance with the provisions of this section shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures) at a laboratory certified by the TDH Bureau of Laboratories.

§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 CFR §§141.85, 141.86, 141.87, 141.88, or 141.90.

(B) Failure to satisfactorily conduct or satisfactorily 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 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 than 0.015 mg/l for lead or 1.3 mg/l for copper.

(b) Site Selection and Material 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 point-of-entry treatment devices.

(2) Information for conducting a materials survey and selecting sampling sites are provided to each system by the public drinking water program before initial tap sampling is initiated in accordance with the time schedule shown on Table Number 2, subsection (c)(8) of this section. Procedural requirements set forth in 40 CFR §141.86 will be followed for site selection activities except that reporting of tap sampling sites to the public drinking water program shall be conducted using the materials survey and site selection forms supplied by the executive director. Supplemental explanatory correspondence from the system will be considered as part of the materials survey 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.

(c) Tap sampling.

(1) A first draw tap sample means a one-liter 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. It is recommended that the water not be allowed to stand in the plumbing for more than 18 hours prior to collection.

(2) 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 and the system may not challenge, based on alleged errors in the sample collection process, the accuracy of the sampling results.

(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, written explanation to the public drinking water program shall be provided. An alternate site from the system's sampling pool must be selected which meets similar criteria and is within reasonable proximity to the original 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) Number of Tap Samples - Initial Monitoring - Systems shall collect at least one set of tap samples during each of two consecutive six-month monitoring periods.

(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) The first six-month initial monitoring period begins on the dates listed in Table Number 2.

Figure: 30 TAC §290.117(c)(8)

Table No. 2

SYSTEM SIZE (No. of People Served)	FIRST SIX-MONTH MONITORING PERIODS BEGIN
> 50,000	January 1, 1992
3,301 - 50,000	July 1, 1992
< 3,301	July 1, 1993

(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)(2) 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 two six-month periods 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) If the system exceeds an action level for lead or copper during any reduced monitoring period, it must follow public education requirements applicable to action level exceedances during initial monitoring found in subsection (g) of this section. It must also collect the remaining number of samples as required for initial monitoring within 60 days. The results of all samples related to reduced monitoring will be used to determine action level exceedance. Should an exceedance of lead or copper action levels be verified, then procedures of this section applicable to action level exceedances during initial monitoring will be followed.

(5) If after three annual periods of reduced monitoring the system continues to be in compliance with the lead and copper action levels, then the system will be notified to conduct reduced monitoring once every three years.

(f) Monitoring requirements for water quality parameters (WQP's) and source water.

(1) Water quality parameters.

(A) All large water systems (serving populations greater than 50,000) are required to conduct water quality parameters (WQP) monitoring beginning with the initial period of first draw tap samples and continuing until corrosion control is optimized.

(B) All medium and small 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 end of the period in which the exceedance of the lead and/or copper action level took place and continue as long as the 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 systems must conduct WQP monitoring at all entry points and at the number of distribution sites specified in Table Number 3. Small and medium systems that are required to conduct WQP monitoring must monitor at all points of entry and at the required number of distribution sites as shown in the Table Number 3.

Figure: 30 TAC §290.117(f)(1)(D)

Table No. 3

SYSTEM SIZE (# 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 Table Number 3 quarterly and also at entry points biweekly.

(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 points of entry 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 Table Number 3. WQP samples shall continue to be measured at points of entry on a biweekly basis and results submitted to the public drinking water program.

(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 WQP's 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 WQP's to once every three years.

(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.

(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 in order to determine the lead or copper content of source water. Entry point water samples shall be collected in accordance with the requirements of this section regarding sample location, number of samples, and collection methods as specified in §290.106 of this title (relating to Inorganic Contaminants) except that one sample shall be collected from each entry point to the distribution system (no compositing) within six months after notification of the exceedance of the lead and/or copper action level. If acceptable entry point water data is not available for large systems, the entry point water lead level shall be considered as zero for purposes of determining whether a corrosion control study is required.

(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 (relating to Inorganic Contaminants).

(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. Source water samples will be submitted by the water system in addition to other inorganic chemical monitoring requirements of these standards.

(g) Public education procedures.

(1) A water system that exceeds the lead action level based on first draw tap water sampling shall deliver to the public the public education materials as listed in 40 CFR §141.85(a), in accordance with the requirements stated in paragraphs (2) and (3) of this subsection.

(2) A community water system must, within 60 days of notification by the executive director:

(A) Insert notices in each customer's utility bill 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; and

(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 must repeat the tasks contained in subparagraphs (A), (B), and (C) of this paragraph every 12 months and the tasks listed in subparagraph (D) of this paragraph every six months for as long as the system exceeds the action level.

(F) Certain requirements of subparagraphs (C) and (D) of this paragraph may be modified by the executive director if justified by local circumstances.

(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(c)(4) 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 pamphlets or brochures on lead in drinking water to each person served by the water system; and.

(C) A nontransient noncommunity water system must repeat the tasks contained in paragraph (3)(A) and (B) of this subsection at least once during each calendar year in which the 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.

(h) 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.

(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 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 system shall install corrosion control treatment by January 1, 1997. Large systems that exceed lead and/or copper action levels must conduct a demonstration study as described in paragraph (4)(B) of this subsection.

(3) Small and medium water systems (serving fewer than 3,301 or serving between 3,301 and 50,000 people, respectively) are deemed to have optimized corrosion control if the 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 18 months after exceedance notification by the executive director for medium-sized water systems and within 24 months after exceedance notification for small water 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 (f)(1)(C) of this section.

(D) On the basis of the evaluation stated in paragraph (4)(A) and (B) of this subsection, the water system shall recommend to the public drinking water program, in writing, the treatment option that constitutes optimum corrosion control or treatment along with sufficient documentation as required by the state to establish the validity of the evaluation procedure. Operational WQP ranges shall be proposed to the state 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 system.

(G) Large 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 systems shall complete the above stated monitoring within 36 months after the executive director designates optimal corrosion control treatment. Small and medium 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 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 installed corrosion control treatment 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 installing corrosion control treatment 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.

(i) Lead service line replacement.

(1) Systems that fail to meet the lead action level in first-draw tap sampling after installing corrosion control and/or source water treatment (whichever occurs last) shall immediately begin to replace annually 7% of the lead service lines identified during its materials survey process unless otherwise instructed by the executive director.

(2) If the system is in violation for failure to install source water or corrosion control treatment, the executive director may require the system to commence lead service line replacement after the date by which the system was required to conduct follow-up monitoring as specified in subsection (h)(4)(G) of this section.

(3) The water system shall replace the entire service line (up to the building inlet) unless it demonstrates to the satisfaction of the executive director in writing that it controls less than the entire service line. The written statement must indicate that the water system has none of the following forms of control over the service line: municipal ordinances; public service contracts or applicable legal authority; authority to set standards for construction; repair or maintenance; or ownership. In such a case, the system shall replace that portion of the lead service line that it controls and notify the owner that it will also replace the building owner's portion of the line. The system is not required to bear the cost of replacing the building owner's portion of the line.

(4) Lead service line means a service line which is made all or in part of lead and connects the water main to the building inlet including any lead pigtail, gooseneck, or other fitting which is connected to such line.

(5) The system may cease replacing lead service lines whenever subsequent 90th percentile first-draw-tap sampling in two consecutive monitoring periods is less than the lead action level. Lead service line replacement shall immediately resume if first-draw-tap samples exceed the 90th percentile lead action/level.

(j) 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 Texas Department of Health Bureau of Laboratories. 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.

(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 along with correctly completed laboratory submission forms supplied by the executive director.

(6) Bottles supplied by the executive director or the certified laboratory must be used for collecting the tap samples.

(k) Reporting and recordkeeping requirements.

(1) Reporting requirements.

(A) Report all results of Water Quality Parameter (WQP) analyses including the location/address of each distribution system sampling point. This report must include each WQP specified in subsection (f) of this section, as well as all sample results from entry points to the distribution system.

(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 TDH laboratory are normally provided simultaneously to the water system and the executive director.) 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.

(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 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 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 (i) 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 (g) of this section.

(G) When required by the executive director, the system must report any sampling data collected by the water system in addition to the items listed in subparagraphs (A) - (F) of this paragraph.

(H) Corrosion control treatment data shall be reported as required by the executive director for 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 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. Community and nontransient noncommunity 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 point of entry to the distribution system.

(2) Each surface water source shall be sampled annually at the point of entry 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 Texas Department of Health Bureau of Laboratories.

(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 MCLs, and action levels requirements of this subchapter must be analyzed by a laboratory certified by the Texas Department of Health Bureau of Laboratories. 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 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 Permitting and Resource Management Division, MC-155, Texas Natural Resource Conservation Commission, 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 141.22(a) for turbidity analyses;

(3) section 141.23(f) 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(b) for disinfection by-product analyses;

(7) section 141.131(c) for disinfectant analyses;

(8) section 141.131(d) for alkalinity 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.

§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) Monitoring locations. 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 Radiological Sampling and Analytical Requirements), §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 Turbidity), §290.112 of this title (relating to Total Organic Carbon (TOC)), §290.113 of this title (relating to Disinfection By-products (TTHM and HAA5)), §290.114 of this title (relating to Disinfection By-products other than TTHM and HAA5), §290.115 of this title (relating to Transition Rule for Disinfection By-products), §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.

(B) Each point of entry to the distribution system shall be identified in the monitoring plan as follows:

(i) a written description of the physical location of each point of entry to the distribution system shall be provided; or

(ii) the location of each point of entry 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) Monitoring frequency. 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, and annual 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 MCLs, MRDLs, and treatment techniques that apply to the system.

(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 system must update the monitoring plan when the system's sampling requirements or protocols change.

(1) Public water systems that treat surface water or groundwater under the direct influence of surface water and serve at least 10,000 people must submit a copy of the monitoring plan to the public drinking water program by January 1, 2001.

(2) Public water systems that treat surface water or groundwater under the direct influence of surface water and serve fewer than 10,000 must submit a copy of the monitoring plan to the public drinking water program by January 1, 2003.

(3) Public water systems that treat groundwater that is not under the direct influence of surface water or purchase treated water from a wholesaler must submit a copy of the monitoring plan to the public drinking water program upon the request of the executive director.

(4) All water systems must provide the public drinking water program with any revisions to the plan upon the request of the executive director.

(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 upon request 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 MCL or treatment technique violation that poses an acute threat to public health. Each notice required by this section must provide a clear and readily understandable explanation of the violation, any potential adverse health effects, the population at risk, the steps that the public water system is taking to correct such violation, the necessity for seeking alternative water supplies, if any, and any preventive measures the consumer should take until the violation is corrected.

(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) A treated water turbidity level above 5.0 NTU in the combined filter effluent of a treatment plant that is treating surface water or groundwater under the direct influence of surface water;

(C) A violation of the MCL for nitrate or nitrite as defined in §290.106(b) 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 §290.110(f)(5)(B) of this title (relating to Disinfectant Residuals); and

(E) Other violations deemed by the executive director to pose an acute risk to human health.

(2) The public notice for an acute MCL and treatment technique violation shall include the contaminant-specific language contained in 40 CFR §141.32 and other pertinent information specified by the executive director.

(A) The owner or operator of a system with an acute microbiological or turbidity violation as described in paragraph (1)(A) and (B) of this subsection shall include a boil water notice issued in accordance with the requirements of §290.46(s) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems).

(B) Each notice shall be conspicuous and shall not contain unduly technical language, unduly small print, or similar items that frustrate the purpose of the notice.

(C) Each notice shall include the telephone number of the owner, operator, or designee of the public water system as a source of additional information concerning the notice.

(D) Where appropriate, the notice shall be multilingual.

(3) The acute public notice and boil water notice required by paragraph (2)(A) of 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 other acute MCL or treatment technique violations shall be issued as soon as possible but in no case later than 72 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 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.

(B) 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 hand delivery or by continuous posting in conspicuous places within the area served by the system.

(C) The owner or operator of a noncommunity water system shall issue the notice violation by hand delivery or by continuously posting the notice in conspicuous places within the area served by the system.

(4) The owner or operator of a 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. If the owner or operator of a noncommunity water system issued the initial notice by hand delivery, notice by hand delivery must be repeated at least every three months for as long as the violation exists.

(5) 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.

(b) Public notification requirements for other MCL or treatment technique violations. The owner or operator of a public water system must notify persons served by their system of any MCL or treatment technique violation other than those described in subsection (a)(1) of this section. Each notice required by this section must provide a clear and readily understandable explanation of the violation,

any potential adverse health effects, the population at risk, the steps that the public water system is taking to correct such violation, the necessity for seeking alternative water supplies, if any, and any preventive measures the consumer should take until the violation is corrected.

(1) The violation notice for an MCL or treatment technique violation shall include the contaminant-specific language contained in 40 CFR §141.32 and other pertinent information specified by the executive director.

(A) Each notice shall be conspicuous and shall not contain unduly technical language, unduly small print, or similar items that frustrate the purpose of the notice.

(B) Each notice shall include the telephone number of the owner, operator, or designee of the public water system as a source of additional information concerning the notice.

(C) Where appropriate, the notice shall be multilingual.

(2) The initial public notice for an MCL or treatment technique violation that does not pose an immediate threat to public health must be issued as soon as possible but in no case later than 14 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 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 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 issued by hand 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 hand delivery or by continuously posting the notice in conspicuous places within the area served by the system.

(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) 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 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 continuously posting the notice, the posting must continue for as long as the violation exists.

If the owner or operator of a noncommunity water system issued the initial notice by hand delivery, notice by hand 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 which fails to perform monitoring required by these standards, 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 (relating to General Applicability) shall notify persons served by the system.

(1) Each notice required by this section must provide a clear and readily understandable explanation of any violation variance, or exemption, any potential adverse health effects, the population at risk, the steps that the public water system is taking to correct such violation, the necessity for seeking alternative water supplies, if any, and any preventive measures the consumer should take until the violation is corrected.

(A) Each notice shall be conspicuous and shall not contain unduly technical language, unduly small print, or similar items that frustrate the purpose of the notice.

(B) Each notice shall include the telephone number of the owner, operator, or designee of the public water system as a source of additional information concerning the notice.

(C) Where appropriate, the notice shall be multilingual.

(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 either a daily or weekly newspaper of general circulation, notice shall instead be given by hand 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 hand delivery or by continuously posting the notice in conspicuous places within the area served by the system.

(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 three 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.

(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. If the owner or operator of a noncommunity water system issued the initial notice by hand delivery, notice by hand 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) 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 maximum contaminant level, 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.

(e) Proof of public notification. Example copies of all notifications required under this paragraph must be submitted to the executive director within ten days of its distribution as proof of public notification.