

TITLE 18. ENVIRONMENTAL QUALITY
CHAPTER 4. DEPARTMENT OF ENVIRONMENTAL QUALITY
SAFE DRINKING WATER

ARTICLE 1. GENERAL REQUIREMENTS

R18-4-101. Definitions

In addition to the definitions in A.R.S. 49-201, in this Chapter, unless otherwise specified:

“Action level” means a concentration of 0.015 mg/L for lead or 1.3 mg/L for copper.

“ADHS” means the Arizona Department of Health Services.

“Air-gap separation” means a physical separation, between the discharge end of a supply pipe and the top rim of its receiving vessel, of at least one inch or twice the diameter of the supply pipe, whichever is greater.

“ANSI/NSF Standard 60” means American National Standards Institute/NSF International Standard 60 - 2000a, Drinking Water Treatment Chemicals - Health Effects, November 2000, incorporated by reference and on file with the Department and the Office of the Secretary of State. This material is available from NSF International, 789 North Dixboro Road, P.O. Box 130140, Ann Arbor, MI 48113-0140, USA; (734) 769-8010; <http://www.nsf.org>. This incorporation by reference includes no future editions or amendments.

“ANSI/NSF Standard 61” means American National Standards Institute/NSF International Standard 61 - 2000a, Drinking Water System Components - Health Effects, November 2000, incorporated by reference and on file with the Department and the Office of the Secretary of State. This material is available from NSF International, 789 North Dixboro Road, P.O. Box 130140, Ann Arbor, MI 48113-0140, USA; (734) 769-8010; <http://www.nsf.org>. This incorporation by reference includes no future editions or amendments.

“Backflow” means a reverse flow condition that causes water or mixtures of water and other liquids, gases, or substances to flow back into the distribution system. Backflow can be created by a difference in water pressure (backpressure), a vacuum or partial vacuum (backsiphonage), or a combination of both.

“Backflow-prevention assembly” means a mechanical device used to prevent backflow.

“Baseline sampling” means the routine monitoring of contaminants covered under the monitoring assistance program to determine compliance with the MCLs listed in Article 2 and the monitoring requirements listed in Article 4, not including repeat monitoring necessary for compliance after detection of a contaminant or a MCL violation.

“BAT” means best available technology.

“Best available technology” means a technology, treatment technique, or other means that is identified by EPA, after examination for efficacy under field conditions and not solely under laboratory conditions, as being the best available for removing or reducing the concentration of a contaminant in water, taking costs into consideration.

“CCR” means Consumer Confidence Report.

“Certified operator” has the meaning prescribed by R18-5-101.

“Coagulation” means a treatment process that uses coagulant chemicals and mixing to destabilize and agglomerate colloidal and suspended materials into flocs.

“Community water system” means a public water system that serves 15 or more service connections used by year-round residents or that serves 25 or more year-round residents.

“Compliance cycle” means a nine-calendar-year time-frame during which a public water system is required to monitor. Each compliance cycle consists of three three-year compliance periods. The first compliance cycle began January 1, 1993, and ends December 31, 2001. The second compliance cycle begins January 1, 2002, and ends December 31, 2010. The third compliance cycle begins January 1, 2011, and ends December 31, 2019.

“Compliance period” means a three-calendar-year time-frame within a compliance cycle. Within the first compliance cycle, the first compliance period began January 1, 1993, and ended December 31, 1995. The second compliance period began January 1, 1996, and ended December 31, 1998. The third compliance period began January 1, 1999, and ends December 31, 2001.

“Comprehensive performance evaluation” means a thorough review and analysis of a water treatment plant’s performance-based capabilities and associated administrative, operation and maintenance practices. A comprehensive performance evaluation consists of at least the following components: assessment of water treatment 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 comprehensive performance evaluation report.

“Consecutive public water system” means a public water system that obtains all of its water from another public water system that is regulated by the Department.

“Contaminant” means any physical, chemical, biological, or radiological substance in water.

“Contractor” means a private party or statewide nonprofit organization representing a water system, with which the Department contracts to implement the monitoring assistance program under A.R.S. 49-360(B).

“Conventional filtration” means a series of treatment processes, including coagulation, flocculation, sedimentation, and filtration that result in substantial particulate removal.

“Corrosion inhibitor” means a substance that reduces corrosion of metal plumbing materials, especially lead and copper, by forming a protective film on the interior surface of those materials.

“Cross connection” means a physical connection between a public water system and any source of water or other substance that may lead to contamination of the water provided by the public water system through backflow.

“CWS” means community water system.

“Detected” means measured in a laboratory at a concentration that is at or above the method detection limit.

“Diatomaceous earth filtration” means a treatment process that results in substantial particulate removal in which a precoat cake of diatomaceous earth filter media is deposited on a support membrane (septum) and, while the water is filtered through the precoat cake on the septum, additional filter media (body feed) is continuously added to the feed water to maintain the permeability of the precoat cake.

“Direct filtration” means a series of treatment processes, including coagulation and filtration but excluding sedimentation, that result in substantial particulate removal.

“Disinfectant” means an oxidant, including chlorine, chlorine dioxide, chloramines, ozone, or an equivalent agent or process such as ultraviolet light, that kills or inactivates pathogenic organisms.

“Disinfection” means a treatment process that kills or inactivates pathogenic organisms in water by oxidants, ultraviolet light, or equivalent agents.

“Distribution system” means a pipeline, appurtenance, device, and facility of a public water system that conducts water from a source or water treatment plant to persons served by the system.

“Domestic or other non-distribution system plumbing problem” means a total coliform contamination problem in a public water system with more than one service connection that is limited to a specific service connection from which a total coliform-positive sample is taken.

“Dose equivalent” means the product of an absorbed dose from ionizing radiation and factors that account for differences in biological effectiveness due to the type of radiation and its distribution in the body as specified by the International Commission on Radiological Units and Measurements.

“Double check valve assembly” means a backflow-prevention assembly that contains two independently acting check valves with tightly closing, resilient-seated shut-off valves on each end of the assembly and properly located, resilient-seated test cocks.

“Elementary business plan” means a document containing all items, required to be submitted for evaluation, necessary for a complete review for technical, managerial, and financial capacity of a new public water system under Article 6.

“Enhanced coagulation” means the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.

“Enhanced softening” means the improved removal of disinfection byproduct precursors by precipitative softening.

“EPA” means the United States Environmental Protection Agency.

“Exclusion” means a waiver granted by the Department under R18-4-112 from a requirement of this Chapter that is not a requirement contained in 40 CFR 141, the National Primary Drinking Water Regulations.

“Exemption” means a temporary deviation from a MCL or treatment technique required in this Chapter that is granted by the Department under R18-4-111.

“Existing public water system” means a public water system, as defined in A.R.S. 49-352(B)(1), issued a public water system identification number by the Department before October 1, 1999.

“Filter profile” means a graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from startup to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed.

“Filtration” means a treatment process for removing particulate matter from water by passage through porous media.

“Financial capacity” means the ability of a public water system to acquire and manage sufficient financial resources for the system to achieve and maintain compliance with the federal Safe Drinking Water Act.

“First-draw sample” means a one-liter sample of tap water, collected in accordance with R18-4-310(D).

“Flocculation” means a treatment process to enhance agglomeration or collection of smaller floc particles into larger and more easily settleable particles through gentle stirring by hydraulic or mechanical means.

“GAC” means granular activated carbon.

“GAC10” means granular activated carbon filter beds with an empty-bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of every 180 days.

“GC” means gas chromatography.

“GC/MS” means gas chromatography-mass spectrometry.

“Gross alpha particle activity” means the total radioactivity due to alpha particle emission as inferred from measurements on a dry sample.

“Gross beta particle activity” means the total radioactivity due to beta particle emission as inferred from measurements on a dry sample.

“Groundwater system” means a public water system that is supplied solely by groundwater that is not under the direct influence of surface water.

“Groundwater under the direct influence of surface water” means any water beneath the surface of the ground with:

A significant occurrence of insects or other macroorganisms, algae, large diameter pathogens such as *Giardia lamblia*, or total coliform; or

Significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH that closely correlate to climatological or surface water conditions.

“HAA5” means haloacetic acids (five).

“Haloacetic acids (five)” means the sum of the concentrations in milligrams per liter of the haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid), rounded to two significant figures after addition.

“Halogenated” means treated or mixed with chlorine, bromine, or iodine.

“HPC” means heterotrophic plate count.

“Initial compliance period” means the first full three-year compliance period in a compliance cycle that a public water system conducts initial monitoring.

“Initial monitoring year” means the calendar year designated by the Department within a compliance period in which a public water system conducts initial monitoring at a sampling point.

“Large water system,” for R18-4-306 through R18-4-316 only, means a public water system that serves more than 50,000 persons.

“Lead-free” means that the pipe, solder, or flux used in the installation or repair of a public water system, or in a residential or non-residential facility that provides water for human consumption and is connected to the public water system, meets the following criteria:

All solders and flux contain not more than 0.2% lead.

All pipes and pipe fittings contain not more than 8.0% lead.

When used with respect to plumbing fittings and fixtures intended by the manufacturer to dispense water for human ingestion, “lead-free” means fittings and fixtures that are in compliance with ANSI/NSF Standard 61, Section 9.

“Lead service line” means a service line made of lead that connects a water main to a building inlet and any lead pigtail, gooseneck, or fitting that is connected to the service line.

“Log” means the percentage removal or inactivation of *Cryptosporidium* oocysts, *Giardia lamblia* cysts, or viruses as follows:

“One-log” is 90%.

“Two-log” is 99%.

“Three-log” is 99.9%.

“Four-log” is 99.99%.

“Major stockholder” means a person who has 20% or more ownership interest in a public water system.

“Man-made beta particle and photon emitters” means all radionuclides emitting beta particles or photons, except the daughter products of Thorium-232, Uranium-235, and Uranium-238, listed in “Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure,” Handbook 69, U.S. Department of Commerce, National Bureau of Standards, amended as of August 1963 (and no future editions or amendments), incorporated by reference and on file with the Office of the Secretary of State and the Department. Copies of Handbook 69 are also available from the Library of Congress, 101 Independence Avenue, S.E., Washington D.C., 20540, by telephoning (202) 707-5640.

“Managerial capacity” means the ability of a public water system to conduct its affairs in a manner that will meet and maintain compliance with the requirements of the federal Safe Drinking Water Act.

“Maximum contaminant level” means the maximum permissible level for a contaminant in drinking water that is delivered to any person who is served by a public water system.

“Maximum residual disinfectant level” means a level of a disinfectant added for water treatment that may not be exceeded at the consumer’s tap without an unacceptable possibility of adverse health effects.

“Maximum total trihalomethane potential” means the maximum concentration of total trihalomethanes produced in water containing a disinfectant residual after seven days at a temperature of 25 °C or above.

“MCL” means maximum contaminant level.

“MFL” means million fibers per liter greater than 10 microns in length.

“Medium water system,” for R18-4-306 through R18-4-316 only, means a public water system that serves more than 3,300 persons and 50,000 or fewer persons.

“Meter” means a device that measures the volume of water that passes through it.

“Meter weight” means the number of gallons per minute (gpm) that flows through a meter divided by 30.

“Millirem” means 1/1000 of a rem.

“MRDL” means maximum residual disinfectant level.

“MTP” means maximum total trihalomethane potential.

“Monitoring assistance program” means the program established by A.R.S. 49-360, under which a contractor provides for collection, transportation, and analysis of samples from a public water system under the provisions of R18-4-224 through R18-4-226.

“Nephelometric turbidity unit” means the unit of measure for turbidity. Turbidity is a measure of light scatter or absorption caused by suspended or colloidal matter in water. Turbidity is measured as an indicator of the effectiveness of filtration treatment.

“New public water system” means a public water system, as defined in A.R.S. 49-352(B)(1), that is issued its first unique public water system identification number by the Department on or after October 1, 1999.

“Noncommunity water system” means a public water system that is either a nontransient, noncommunity water system or a transient, noncommunity water system.

“Nontransient, noncommunity water system” means a public water system that:

Serves 15 or more service connections that are used by the same persons for at least six months per year, or

Serves the same 25 or more persons for at least six months per year.

“NTNCWS” means nontransient, noncommunity water system.

“NTU” means nephelometric turbidity unit.

“Optimal corrosion control treatment” means the corrosion control treatment that minimizes lead and copper concentrations at the tap without violating any rule prescribed in this Chapter.

“OX” means chlorine or ozone oxidation.

“PCBs” means polychlorinated biphenyls.

“pCi” means picocurie.

“Picocurie” means the quantity of radioactive material producing 2.22 nuclear transformations per minute.

“Point-of-entry into the distribution system” means the point at which water is discharged into the distribution system from a well, storage tank, pressure tank, or water treatment plant.

“Point-of-entry treatment device” means a device that applies treatment to drinking water entering a house or building to reduce contaminants in the drinking water that is distributed throughout the house or building.

“Point-of-use treatment device” means a device that applies treatment to drinking water flowing to a single tap to reduce contaminants in the drinking water at that single tap.

“Pressure vacuum breaker assembly” means a backsiphonage prevention assembly that contains an independently operated, internally loaded check valve; an internally operated air-inlet valve located on the discharge side of the check valve; tightly closing resilient seated shut-off valves on each end of the check valve assembly; and properly located resilient seated test cocks.

“PTA” means packed tower aeration.

“Public water system” has the same meaning prescribed in A.R.S. 49-352. A public water system is either a community water system; a nontransient, noncommunity water system; or a transient, noncommunity water system.

“Reduced pressure principle backflow-prevention assembly” means a backflow-prevention assembly that contains two independently acting check valves; a hydraulically operating, mechanically independent pressure differential relief valve located between the two check valves; tightly closing, resilient seated shut-off valves on each end of the check valve assembly; and properly located resilient seated test cocks.

“Rem” means the unit of dose equivalent from ionizing radiation to the total body or any internal organ or organ system.

“Repeat compliance period” means any compliance period after the initial compliance period.

“Residual disinfectant concentration” means the concentration of disinfectant measured in mg/L in a representative sample of water.

“Safe Drinking Water Act” means the federal Safe Drinking Water Act as amended (42 U.S.C. 300f et seq., Title XIV of the Public Health Service Act).

“Sanitary survey” means an onsite review of the water source, facilities, equipment, operation, and maintenance of a public water system to evaluate their adequacy to produce and distribute safe drinking water.

“Sedimentation” means a treatment process that holds water in a low-flow condition before filtration to remove solids by gravity or

separation.

“Service connection” means a location at the meter or, in the absence of a meter, at the curbstop or at the building inlet.

“Service line” means the water line that runs from the corporation stop at a water main to the building inlet, including any pigtail, gooseneck, or fitting.

“Service line sample” means a one liter sample of water collected in accordance with R18-4-315(D).

“Single-family structure” means a building constructed as a single-family residence that is used as a residence or as a place of business.

“Slow sand filtration” means a treatment process that involves the passage of raw water through a bed of sand at low velocity, generally less than 0.4 m/h, and results in substantial particulate removal by physical and biological mechanisms.

“Small water system,” for R18-4-306 through R18-4-316 only, means a public water system that serves 3,300 or fewer persons.

“SOC” means synthetic organic chemical.

“Source” means a body of water above or below the ground that supplies water to a public water system, including a well, spring, or surface water.

“Specific ultraviolet absorption” means an indicator of the humic content of a water at 254 nanometers (nm). It is a calculated parameter obtained by dividing a sample’s ultraviolet absorption at a wavelength of 254 nm (UV_{254}) (in m^{-1}) by its concentration of dissolved organic carbon (DOC) (in mg/L).

“Standard sample” means the aliquot of finished drinking water that is examined for the presence of coliform bacteria. The standard sample volume is 100 milliliters.

“Surface water” means a source that is exposed to the unenclosed atmosphere and subject to surface runoff.

“Surface water system” means a public water system that uses surface water or groundwater under the direct influence of surface water, in whole or in part, as a source.

“SUVA” means specific ultraviolet absorption.

“Technical capacity” means the ability of a public water system to meet the requirements of R18-4-603 and the federal Safe Drinking Water Act at all times, and includes the ability to correct problems with its distribution, water quality, or source availability and to sustain compliance with its operations and maintenance plan.

“TNCWS” means transient, noncommunity water system.

“TOC” means total organic carbon.

“Total organic carbon” means total organic carbon in mg/L 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.

“Total trihalomethanes” means the sum of the concentrations of the following trihalomethane compounds: trichloromethane (chloroform), dibromochloromethane, bromo-dichloromethane, and tribromomethane (bromoform).

“Transient, noncommunity water system” means a public water system that:

Serves 15 or more service connections, but does not serve 15 or more service connections that are used by the same persons for more than six months per year; or

Serves an average of at least 25 persons per day for at least 60 days per year, but does not serve the same 25 persons for more than six months per year.

“Treatment” means a process that changes the quality of water by physical, chemical, or biological means.

“Treatment technique” means a treatment procedure promulgated by EPA in lieu of a MCL. Treatment techniques include the requirements for filtration, disinfection, lead, copper, acrylamide, and epichlorohydrin that are prescribed in Article 3 of this Chapter.

“Trihalomethane” means one of the family of organic compounds, named as derivatives of methane, in which three of four hydrogen atoms in methane are substituted by a halogen atom in the molecular structure.

“TTHM” means total trihalomethanes.

“Unit fee” means the amount charged to a public water system under the monitoring assistance program for a meter weight of 1 in accordance with R18-4-225.

“Virus” means an enteric virus that is infectious to humans by waterborne transmission.

“VOC” means volatile organic chemical.

“Water main” means a pipe used to distribute drinking water to more than one property and is exterior to buildings.

“Water supplier” means a person who owns, supervises, or directs the operation of a public water system.

“Waterborne disease outbreak” means the occurrence of illness that is epidemiologically associated with the ingestion of drinking water from a public water system.

“Water treatment plant” means a process, device, or structure used to improve the physical, chemical, or biological quality of the water in a public water system. A booster chlorination facility that is designed to maintain an effective disinfectant residual in water in the distribution system is not a water treatment plant.