ADEQ
Arizona Department of Environmental Quality

The Safe Drinking Water Act: Drinking Water System Regulatory Overview

Safe Drinking Water Act

- The Safe Drinking Water Act (SDWA) is the main federal law that ensures the quality of Americans' drinking water. Under SDWA, the U.S. Environmental Protection Agency (EPA) sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards.

SDWA Continued…

- SDWA was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells.

State Primacy

- THz Safe Drinking Water Act includes a requirement that EPA establish and enforce standards (MCLs, treatment techniques, monitoring) that public drinking water systems must adhere to. States and Indian Tribes are given primary enforcement responsibility (e.g. primacy) for public water systems in their State if they meet certain requirements.

State Primacy Continued…

- Some of the major requirements for receiving primacy include:
  - have regulations for contaminants regulated by the national primary drinking water regulations that are no less stringent than the regulations promulgated by EPA **(ADEQ)**
  - have a program to certify laboratories that will analyze water samples required by the regulations **(ADHS)**
  - have a laboratory that will serve as the State's "principal" lab, that is certified by EPA **(ADHS)**

Some Additional Requirements for Receiving Primacy

- have adopted and be implementing procedures for the enforcement of State regulations
- have a program to conduct sanitary surveys of the systems in the State
- have right to enter and inspect water system facilities

What *Is* Regulated

- Microorganisms – (e.g., bacteria)
- Disinfectants (e.g., chlorine)
- Disinfection Byproducts (e.g., TTHMs)
- Inorganic Contaminants (e.g., arsenic)
- Organic Contaminants (e.g., pesticides, herbicides, petroleum derivatives)
- Radionuclides (e.g., gross alpha, uranium)

Primary Contaminants of Concern for Arizona

- **Nitrate –** historic/ongoing agricultural practices and septic tank systems
- **Fluoride –** naturally occurring
- **Arsenic –** naturally occurring
- **Total Coliform Bacteria –** naturally occurring
- **Disinfection By-Products** (TTHMs, HAA5s) – byproducts of disinfection

What *Is Not* Regulated

- Constituents that primarily affect aesthetic qualities (e.g., color, taste and odor)
  - Total Dissolved Solids (TDS)
  - Iron
  - pH
  - Manganese
  - etc.

Who samples for Disinfectant Residuals/Disinfection By-products?

- Community & Non-transient Non-community water systems that add and/or deliver water that is treated with a primary or residual disinfectant (in any part of the drinking water treatment process) other than ultra violet light (UV).
- Transient Non-community water systems, only if they use CHLORINE DIOXIDE.
- Consecutive systems (buy some of all of their water from another public water system) - if they chlorinate or receive chlorinated water.

Maximum Residual Disinfectant Levels (MRDLs) for Disinfection Residuals

Disinfectant Residual	MCL (mg/L) (as a running annual average)
Chlorine	**4.0 (as Cl_2)**
Chloramines	**4.0 (as Cl_2)**
Chlorine Dioxide	**0.8 (as ClO_2)**

Q: For a system to comply with the MRDLs for chlorine and chloramine, what residual disinfectant concentration should be measured?

A: For a system that uses free chlorine for residual maintenance, either free or total chlorine measurement is acceptable.

For a system that uses chloramines for residual maintenance, the measure must be combined or total chlorine.

http://water.epa.gov/lawsregs/rulesregs/sdwa/mdbp/upload/2001_10_23_mdbp_stage1dbprfaqs.pdf

Q: For a system to comply with the MRDLs for **chlorine dioxide**, what:

1) residual disinfectant concentration should be measured
2) when should it be measured, and
3) at what monitoring frequency?

A: Under the MRDL Rule, systems that disinfect their water using chlorine dioxide must:

1) monitor for chlorine dioxide
2) sample at the entrance to the distribution system, and
3) must take daily samples

Surface Water Treatment Rule

- The Surface Water Treatment Rule seeks to prevent waterborne diseases caused by viruses, *Legionella*, *Giardia lamblia* and *Cryptosporidium*. These disease-causing microbes are present at varying concentrations in most surface waters. The rule requires that water systems filter and disinfect water from surface water sources to reduce the occurrence of unsafe levels of these microbes.
- The Surface Water Treatment Rule uses turbidity to measure the performance of filtration systems.

Applicability of the Surface Water Treatment Rule (SWTR)?

- The SWTRs apply to public water systems that use surface water or ground water under the direct influence of surface water (GWUDI) as a source.

Turbidity and Disinfection Requirements

- The SWTRs establish requirements for the control of turbidity and require disinfection of surface water systems. Surface water systems are required to meet specific removal and/or inactivation criteria. To meet these requirements they must measure the finished water turbidity as well as the disinfection residual entering the distribution system and must maintain a detectable disinfectant residual in the distribution system (i.e., 0.2 mg/L)
- Turbidity limits and monitoring requirements depend on the type of filtration process that is utilized.

Individual Filter Effluent Monitoring Requirements

- Filtration is one of the most critical treatment processes for particle and pathogen removal. Systems using conventional or direct filtration must also conduct continuous monitoring of the turbidity in the effluent from individual filters to provide information about each filter's performance.
- This requirement allows systems to identify filters whose poor performance might be masked by lower turbidity combined filter effluent. Individual filter performance problems, indicated by an exceedance of certain turbidity limits for specified time periods, trigger follow-up actions.

Turbidity Limits for Different Filtration Processes

- Systems Using Conventional or Direct Filtration
  - Combined Filter Effluent must be $\leq$ 0.3 NTUs in at least 95% of measurements taken each month
  - Combined Filter Effluent Maximum Value must not exceed 1 NTUs
  - Individual Filter Effluent must not exceed 1.0 NTUs in two consecutive measurements taken 15 minutes apart
    - And, for systems serving $\geq$ 10,000 persons, 0.5 NTUs in two consecutive measurements taken 15 minutes apart at the end of the first four hours of continuous operation after the filter has been backwashed or taken offline

Turbidity Limits for Different Filtration Processes Continued…

- Systems Using Alternative or Slow Sand Filtration Technologies
  - Combined Filter Effluent must be $\leq$ 1 NTUs in at least 95% of measurements taken each month
  - Combined Filter Effluent Maximum Value must not exceed 5 NTUs
  - Individual Filter Effluent monitoring – not required