



Water Facts

- Drinking Water Guidelines and Standards
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Drinking Water Guidelines and Standards

The EPA sets National Primary and Secondary Drinking Water Standards in collaboration with community water system organizations, scientists, state and local agencies, the public, and others. States and Native American Communities facilitate implementation of these standards by regulating public and private water systems. Standards are published in the Code of Federal Regulations (Figure 10). Drinking water standards are always evolving as new analytical methods are developed, scientific information becomes available, and new priorities are set in response to the potential health effects of contaminants.

In Arizona, these standards apply to “community water systems,” which are systems that serve at least 15 connections used by year-round residents of the area served, or that regularly serves at least 25 year-round residents. Domestic wells that serve water below these limits are not required to comply with the drinking water quality standards. In Arizona, wells equipped with a pump that pumps less than 35 gallons per minute and serve a household (or several households) are private domestic wells are not monitored for water quality. Private domestic “exempt” wells in Arizona are not regulated for water quality and for that reason it is important for well owners to be aware of drinking water guidelines and to test their water quality against those standards.

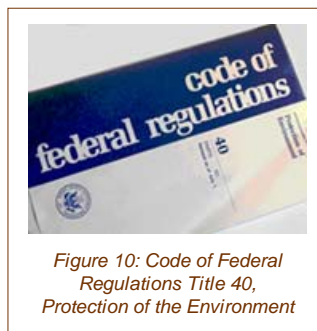


Figure 10: Code of Federal Regulations Title 40, Protection of the Environment

Primary Drinking Water Standards

The EPA considers many issues and factors when setting a standard. These include current scientific data, availability of technologies for the detection and removal of contaminants, the occurrence or extent of a chemical in the environment, the level of human exposure, potential health effects (risk assessment) and the economic cost of water treatment.

Community water systems must comply with National Primary Drinking Water Standards by providing water to their customers that does not exceed the MCL of any listed contaminant. Contaminants listed as primary drinking water concerns are known to have an unacceptable human health and/or environmental risk if found in concentrations greater than the MCL. Also, when water sources are treated by community water utilities, they must use EPA-mandated or EPA-accepted water treatment methods to treat below the primary MCL.

Primary contaminants regulated under the NPDWS include inorganic contaminants (such as arsenic and lead), organic chemical contaminants (such as insecticides, herbicides, and industrial solvents like trichloroethylene or TCE), water disinfectants (such as chlorine and chloramines), disinfection by-products (such as chloroform), radionuclides (such as uranium) and microorganisms (such as *Giardia* and intestinal viruses). The complete list of these contaminants, including the MCL allowable in a drinking water supply can be found on the EPA website.

If your well water exceeds the MCL for any listed contaminant, your water supply may be a health risk. You must treat your water to avoid the health risk or find an alternative supply.

| Contaminant | Secondary Standard |
|----------------|-------------------------|
| Aluminum | 0.05 to 0.2 mg/L |
| Chloride | 250 mg/L |
| Color | 15 (color units) |
| Copper | 1.0 mg/L |
| Corrosivity | noncorrosive |
| Fluoride | 2.0 mg/L |
| Foaming Agents | 0.5 mg/L |
| Iron | 0.3 mg/L |
| Manganese | 0.05 mg/L |
| Odor | 3 threshold odor number |

Secondary Drinking Water Standards

EPA has established National Secondary Drinking Water Standards (NSDWS) that set non-mandatory water quality standards for 15 contaminants, as shown on *Table 1*. EPA does not enforce these “Secondary Maximum Contaminant Levels” of SMCLs. They are established only as guidelines to assist community water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health, and community water systems are not required to reduce these chemicals below the SMCL. However, water utilities control the levels of these chemicals in the water in order to prevent tap water odor and taste-related customer complaints.

If your well water exceeds the SMCL for any listed contaminant in *Table 1*, you may want to consider water treatment to bring your water supply within aesthetic considerations. A discussion of selected SMCLs follows.

Total Dissolved Solids (TDS)

Most of the minerals found in fresh water are necessary life-sustaining nutrients and many are found in common vitamin supplements. These include calcium, magnesium, potassium, zinc, copper, iron, and selenium. It should be noted, however, that drinking tap water normally does not

| | |
|------------------------|-----------|
| pH | 6.5-8.5 |
| Silver | 0.10 mg/L |
| Sulfate | 250 mg/L |
| Total Dissolved Solids | 500 mg/L |
| Zinc | 5 mg/L |

Table 1. National Secondary Drinking Water Standards

provide the recommended levels of most of these nutrients. For example, drinking 64 ounces (~2L) of water a day containing 50 mg/L calcium would only provide 1/10th of the adult daily requirement of calcium for adults recommended by the National Academy of Sciences.

This measurement combines most dissolved minerals found in water sources into one value. According to the NSDWS drinking water should not have more than 500 mg/L of TDS. Still, potable water that has a higher TDS is not necessarily unhealthy. However, high TDS water may cause deposits and/or staining, and may have a salty taste.

pH

This value measures the active acidity or alkalinity of water. The pH of water is important in controlling pipe corrosion and some taste problems. The recommended pH range is 6.5–8.5.

Taste

Note that TDS and pH do not determine the proportions of the major minerals found in drinking water sources. However, the mineral composition of water may affect its taste. For example, water with a TDS of 500 mg/L composed of table salt would taste slightly salty, have a slippery feel, and be called soft water. Whereas, water with the same TDS value but composed of similar proportions of table salt, gypsum, and calcite would have a more acceptable (less salty) taste and feel less slippery due to its greater water hardness. Salty taste can be reduced by limiting the amounts of chloride and sulfate ions in potable water to less than 250 mg/L each.

Organic Matter

Water color, odor, and foaming are affected by the presence of natural organic matter substances often found in surface (but much less frequently in ground water) supplies. This organic matter may consist of vegetation, such as leaves, that fall into surface water. Similar to what occurs when tea leaves are brewed in water, these natural organic constituents impart taste and color to the water.

Metals and Fluoride

The NSDWS also include recommended levels for aluminum, copper, iron, manganese, fluoride, and zinc. Most of these elements are found in trace quantities (less than 1 mg/L) in fresh waters. However, if not controlled, these elements can impart a metallic taste to water, cause staining, and even be toxic when present in tap water at concentrations above the recommended primary MCLs.