PRIVATE DRINKING WATER IN CONNECTICUT

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The U.S. Environmental Protection Agency (EPA) was authorized by the 1974 Safe Drinking Water Act and its amendments to establish limits on the concentration of certain contaminants that are allowed in public drinking water systems. These limits or standards are set to protect public health by ensuring good water quality. EPA standards for drinking water fall into two categories: Primary Standards and Secondary Standards.

National Primary Drinking Water Standards

Primary standards protect consumers from microbial contaminants, radioactive elements, and toxic chemicals. The EPA sets a non-enforceable goal and an enforceable goal for each drinking water contaminant that is a concern for health. The non-enforceable, maximum contaminant level goal (MCLG) is based entirely on health considerations; as a health goal, it is set at a level at which no adverse health effects should occur. The maximum contaminant level (MCL) represents an enforceable limit. The MCL is the highest concentration of a contaminant allowed in public drinking water systems.

The MCL is set as close as possible to the MCLG for any particular contaminant. However, the MCL also takes into consideration the ability of laboratories to detect the contaminant at low levels, the feasibility of treatment, and the cost of maintaining the levels of the contaminant below the MCL.

National Secondary Drinking Water Standards

Secondary standards relate to aesthetic contaminants that cause offensive taste, odor, color, corrosivity, foaming, or staining. The concentration limit is called the secondary maximum contaminant level (SMCL). Secondary standards are not enforced; they are guidelines for water treatment plant operators and state governments attempting to provide communities with the best quality water possible.

Health Advisories

EPA also issues Health Advisories (HA) which provide information on contaminants that can cause human health effects and are known or anticipated to occur in drinking water. Health Advisories are guidance values based on non-cancer health effects for different durations of exposure (e.g.; one-day, ten-day, and lifetime). They provide technical guidance to EPA Regional Offices, State governments, and other public health officials on health effects, analytical methodologies, and treatment technologies associated with drinking water contamination.

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How Standards Are Set

Primary standards for drinking water contaminants are based on three criteria:

1. The contaminant causes adverse health effects.
2. The contaminant is detectable in drinking water.
3. The contaminant is known to occur in drinking water.

How EPA Sets Primary Drinking Water Standards

In setting Primary Standards for a drinking water contaminant, the EPA first looks at the toxicological data on that contaminant, usually obtained from acute and chronic animal studies. (Human clinical or epidemiological data are used when available, but scientific data linking human health to drinking water contaminants are limited). Experts use this information to estimate the concentration of the contaminant that may be toxic and the concentration level, if any, at which the contaminant causes no adverse health effects.

Acute and Chronic Health Effects

Toxic doses of chemicals cause either acute or chronic health effects. An acute effect usually follows exposure to a large dose of a chemical and occurs almost immediately. Examples of acute health effects are nausea, vomiting, lung irritation, skin rash, dizziness, and even death.

The levels of contaminants found in drinking water are seldom high enough to cause acute health effects. Levels of some contaminants may cause chronic health effects, which occur long after exposure to small amounts of a contaminant. Examples of chronic health effects include cancer, birth defects, organ damage, disorders of the nervous system, and damage to immune system.

Acceptable Daily Intake

The acceptable daily intake (ADI) is the daily dose of a substance (including a safety margin) that a person can ingest over a lifetime without suffering adverse health effects. The ADI is used to establish the MCLG for a contaminant, which in turn is used to set the enforceable MCL.

Risk Estimate

If a contaminant causes cancer, it is assumed that no concentration is safe. Consequently, the MCLG is set at zero, a level that is not always possible to achieve. However, at very low levels the risk of cancer becomes so small that it is considered negligible. Therefore, regulatory officials must decide what level of risk is acceptable. The risk estimate is the level of exposure to a chemical estimated to cause this "acceptable level" of risk.

Current Drinking Water Standards

The EPA is required to update the list of regulated contaminants every 5 years. Currently, EPA regulates over 80 contaminants found in drinking water. Although the EPA oversees public drinking water quality, regulatory officials in each state ultimately set and enforce drinking water standards for EPA-regulated and other contaminants. States are permitted to set standards that are stricter, but not less stringent, than those set by EPA. When a standard is exceeded, the EPA, through the designated state agency, requires that the contaminant level be reduced to the MCL. The corrective treatment is left to the individual water system.

Private Well Owner Responsibility

As a private well owner, you are responsible for ensuring the quality of your own drinking water. Homeowners with private wells are generally not required to test their drinking water to meet standards.

However, you can use the public drinking water standards as guidelines when evaluating the quality of your drinking water. Please refer to Public Health Code Section 19-13-B101 which identifies the monitoring test required for new wells. See Table One for the list of analytes to test for and any established limits.

Public water systems provide treated, potable water to their customers for a fee. The cost of public water includes the costs of protecting the water source, managing and training personnel to use the water supply equipment, monitoring the water for contaminants, obtaining professional engineers' opinions and advice, making improvements to the water treatment and distribution system, planning for expansion, reporting to State and Federal agencies, and managing the financial aspects of the business.

Private well owners should consider the cost of well water maintenance and protections as a budget item, just as if they were paying a water bill. Improvements to water wells, treatment systems and plumbing are a necessary expense that directly benefits the homeowner. Although some treatment systems are expensive, the cost is often less than the price paid by the owner in health effects or nuisance problems.

The seller must disclose the condition of a private well water system at the time of sale of their home. The buyer will likely investigate the water quality and quantity. It is advisable for both parties to work with qualified professionals to inspect the condition of homes and to seek legal advice from attorneys during their transactions.

Drinking Water Standards Are Not Absolute

Setting drinking water standards is an imperfect process influenced by economic, political, and social considerations, in addition to scientific data. Data relating human health effects to chemicals in drinking water are limited, and scientists have difficulty predicting the effects of drinking small amounts of chemicals for many years. Furthermore, standards do not take into consideration the presence of multiple chemicals, which may increase or decrease the toxicity of a particular contaminant.

For these reasons, it is important to understand that primary drinking water standards do not guarantee that water with a contaminant level below the standard is risk-free, nor do they indicate that water with a higher level is unsafe. Drinking water standards represent conservative judgments of scientists and regulatory officials based on all available information on the health effects of drinking water contaminants.

Testing your drinking water will tell you what is in your water at the time the sample is collected. Test results from 6 months ago represent the water quality of the well 6 months ago. The levels of most naturally occurring contaminants stay fairly consistent, or slowly increase or decrease over time, or have a seasonal fluctuation, depending on water levels. The bottom line is that water quality can and does change. Connecticut's requirements for private wells are identified in Section 19-13-B101 of the Public Health Code while water quality standards are included in Section 19-13-B102 (e) of the Public Health Code. Action levels for contaminants are also identified in the Public Health web page under private well action levels. (www.ct.gov/dph)

Table 1 Water Quality Parameters for Private Wells

Parameter	Limit	Comments
Total Coliform Bacteria	None Present	MCL
pH	6.4 - 10.0 SU	MCL
Apparent Color	< 15 SU	
Odor	< 2 Odor Threshold Number	
Chloride	250 mg/L	MCL
Hardness	150 mg/L	
Nitrate-Nitrogen	10 mg/L	MCL
Nitrite-Nitrogen	1 mg/L	MCL
Sulfate	250 mg/L	
Turbidity	< 5 NTU	MCL (for surface water)
Iron	0.3 mg/L	EPA secondary contaminant
Manganese	0.05 mg/L	EPA secondary contaminant
Sodium	28 mg/L	CT Notification level

SU = standard units
mg/L = milligrams per liter = ppm
MCL = Maximum Contaminant Level

Note: Parameters, which do not have a MCL, are recommended limits. Local municipalities may have additional testing requirements.

For more information please click on the following links:
EPA Office of Groundwater and Drinking Water
http://www.epa.gov/ogwdw/
EPA New England
http://www.epa.gov/region01/

Adapted from *Healthy Drinking Waters for Rhode Islanders*, University of Rhode Island Cooperative Extension, *April 2003*.