

CONSUMER CONFIDENCE REPORTS

In accordance with the new "Right-to-Know" requirements of the 1996 Amendments to the Safe Drinking Water Act, all 55,000-plus Public Water Supplies serving 248 million people in the United States must furnish their customers an annual report of their activities and the quality of the drinking water they provide. The first report is due any time from now until October 19, 1999; thereafter, they are due before July 1 every year. Most will mail the reports, but the smallest systems with fewer than 10,000 users may be permitted to use newspapers and other means, and the largest systems will be required to post them on the Internet. Wherever you see it, this Bulletin is to help you to get the most out of it.

Water suppliers can use nearly any format and include as much information as they wish, and the States have the authority to add other requirements or impose even tougher standards, but all CCRs must at least include the following basic information about:

1. the ultimate source of the raw water they treat and supply to you—the name of the lake or river or underground aquifer,
2. a brief summary of the types of contaminants that could possibly be present—that they would have to remove or reduce before selling it to you,
3. how to get a copy of their source water assessment,
4. the level or range of contamination that is found in the finished tap water supplied to you, compared with the health-based standards imposed by the U.S. Environmental Protection Agency (usually a Maximum Contaminant Level [MCL] and an MCL Goal) ,
5. where the contamination comes from, and the potential health effects of any contaminant that exceeds the national standard,
6. a discussion of what they are doing, or need to do, or are planning to do, to correct any water quality shortcomings that could affect your health,
7. a discussion of their compliance with other EPA or State rules regarding drinking water (such as monitoring for contaminants that are not yet regulated),
8. information about *Cryptosporidium*, a common parasite that is difficult to kill or remove, and what especially vulnerable people (infants, the aged, AIDS patients, cancer patients taking chemotherapy, transplant patients taking immunosuppressants, etc.) need to know about it,
9. information about nitrate-nitrite, arsenic, radon, and lead in areas or systems in which these contaminants are common problems, and
10. Telephone numbers of additional sources of information about drinking water quality.

11. The reports must be made available in the major languages prevalent in the region.

These CCRs are not supposed to be your water utility's only method of communicating with you, or even the major one. Whenever a contaminant is found in the finished tap water at a level that could affect your health, they should notify you right away, or at least in the next water bill, and not wait for the annual report. For emergency measures such as "Boil Water Orders" they would use the mass media.

Definitions of special terms and units of measurement

MCL = Maximum Contaminant Level projected to be safe (one-in-a-million chance of illness and death) over a lifetime of consumption, taking costs into account.

MCLG = MCL Goal, if costs didn't matter—usually the same as the MCL, except that carcinogens which are presumed to have no lower "threshold" of activity are automatically given an MCLG of zero.

mg/L = milligrams of contaminant per liter of water. Since there are a million milligrams in a liter of pure water, mg/L is essentially the same as "ppm," which is short for "parts per million."

ug/L or $\mu\text{g/L}$ = micrograms of contaminant per liter of water. A microgram is $1/1000^{\text{th}}$ of a milligram, so there are a billion of them in a liter of pure water, and ug/L is essentially the same as "ppb," the abbreviation for "parts per billion."

NTU = Nephelometric Turbidity Unit. A nephelometer is an optical instrument that measures the ability of a calibrated light beam to penetrate a sample of the water. But, unlike ordinary colorimeters, which have the light source, sample tube, and light detector all in line, a nephelometer detector is at a right angle to the light beam, to measure only scattered light.

PS = Performance Standard. Used instead of an MCL for Turbidity because it is often intentionally increased during treatment, to aid in the removal of particles that can interfere with disinfection. Turbidity is the only water quality parameter that must be measured every day (most utilities monitor it continuously), to assure that disinfection is effective.

TT = Treatment Technique. Used instead of an MCL for contaminants that need to be controlled, but no specific level is accepted as "safe" or "unsafe." When a specific maximum contaminant level is cited, as for copper and lead, it is an "Action Level:" if exceeded, the water-works is required to alter the treatment technique accordingly.

MRDL = Maximum Residual Disinfectant Level. Used instead of an MCL for disinfectants, which are not considered to be "contaminants."

pCi/L = pico-Curies of radioactivity per liter. A curie is equal to 3.7×10^{10} atomic disintegrations per second, or the output of 1 gram of pure Radium-226. A pico-curie is 10^{-12} curies, and the MCL of 5 pCi/L amounts to 1 "click" on a Geiger counter about every 54 seconds.

mrem/year = milli-Roentgen-Equivalent-Man per year. The Roentgen is the physical measurement of a dose of ionizing radiation (X-rays, cosmic rays, gamma rays), and the REM relates the dose to the actual biological damage it does—like a wind chill index does for temperature and wind. For comparisons, it is estimated that the average American receives some 360 mrem of total radiation

yearly, most of which comes from radon gas in the environment, with another 20% from medical X-rays. The maximum annual radiation dose permitted for people who work with radioactive materials is 5000 mrem/year, and the maximum dose for pregnant women and fetuses is 500 mrem/9-month gestation period.

Inorganic Chemicals = minerals, salts, etc. dissolved from rocks, soil, ores, etc. Also, chemical substances that are not made by living things and do not contain the element carbon.

Organic Chemicals = chemical substances containing carbon made by living things, and other synthetic materials manufactured by people—pesticides, plastics, solvents, etc.

Volatile Organic Chemicals (VOCs) = organic chemicals that are such small molecules that they are gases or evaporate readily. Many pesticides, industrial solvents, industrial wastes, and disinfection byproducts are VOCs.

Trihalomethanes and Haloacetic Acids = small one-carbon (THMs) and two-carbon (HAAs) fragments chopped off of naturally-occurring organic matter and then chlorinated—unintended, toxic byproducts of the use of powerful chemical disinfectants such as chlorine and ozone.

U.S. National Secondary Drinking Water Regulations

The “Secondary Standards” regulate contaminants with only aesthetic consequences—things that affect taste, odor, color, and clarity but are not hazardous to health.

Aluminum, Al. MCL = 0.05 or 0.2 mg Al/L Aluminum in water produces color and turbidity. Water works that add aluminum salts to induce coagulation and sedimentation must meet the 0.05 mg/L standard; those where the aluminum is all natural clay (aluminum silicate) particles (turbidity) may have up to 0.2 mg/L.

Chloride ion, Cl⁻. MCL = 250 mg Cl⁻/L. Too much chloride causes a salty taste.

Color. MCL = 15 Color Units. A brownish-yellow tea-like color comprised of tannins and lignins from rotting vegetation. The major source of “disinfection byproducts” such as THMs and HAAs.

Corrosivity. MCL = “non-corrosive.” Estimated with the Langelier Index, which is calculated from the chemical saturation point of calcium carbonate (should be near zero), but indicated by actual corrosion of iron, copper, brass or lead plumbing materials.

Fluoride ion, F⁻. MCL = 2 mg F⁻/L. Too little allows excessive tooth decay; too much causes ugly mottling of the enamel. Lower amounts should be used where it’s hot and people drink more water.

Foaming Agents. MCL = 0.5 mg/L. Measured as synthetic detergent.

Iron, Fe. MCL = 0.3 mg Fe/L. Causes metallic taste and “rust” stains on laundry, dishes, etc.

Manganese, Mn. MCL = 0.05 mg Mn/L. Causes metallic taste and black stains on laundry, etc.

Odor MCL = TON of 3. Common odors are chlorinous, musty-earthly, rubber, rotten eggs. The Threshold Odor Number (TON) identifies the dilution factor that makes the taste & odor disappear. Tested by a panel of trained, experienced human tasters.

pH. MCL = 6.5 to 8.5 pH units. A measure of acidity or acid balance: low pH = acidic, sharp taste, corrosion likely; low pH = slick feel, soapy taste, scaling likely.

Silver ion, Ag^+ . MCL = 0.10 mg Ag/L. Rare in natural water; comes mostly from "bacteriostatic" water filters. Too much leads to grayish coloration of the skin and eyes.

Sulfate ion, SO_4^{-2} . MCL = 250 mg SO_4^{-2} /L. Causes salty taste, corrosion, and a transient diarrhea in visitors. May be changed to a Primary Contaminant.

Total Dissolved Solids, TDS. MCL = 500 mg TDS/L (1000 mg TDS/L in California). Causes salty taste, excess hardness, stains, and deposits.

Zinc, Zn. MCL = 5 mg Zn/L. Causes bitter, metallic taste.