



**COLORADO DEPARTMENT OF
PUBLIC HEALTH AND
ENVIRONMENT**

**LABORATORY SERVICES
DIVISION**

**How to Interpret Water
Test Results for a
Private Well**

**CHEMISTRY LABORATORY
(303) 692-3048
MICROBIOLOGY LABORATORY
(303) 692-3490**

Laboratory Services Division – (303) 692-3090
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Chemistry Laboratory – (303) 692-3048
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Bottle Order Line (Menu driven) –
(303) 692-3074

Photo by Laurie Peterson-Wright

**Colorado Department of Public
Health and Environment
Laboratory Services Division**
8100 Lowry Boulevard
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Find Out More

The world wide web hosts a wealth of information. If you do not have a computer, most public libraries offer internet access and some instruction. The sites below are offered for informational value only. Laboratory Services Division can not guarantee the accuracy of information from the sites listed below.

For more information on current and the future federal drinking water standards and for general information on drinking water topics and issues, contact the EPA at <http://www.epa.gov/safewater> or at:

U.S. Environmental Protection Agency
Office of Ground Water and Drinking Water
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Or call:

The Safe Drinking Water Hotline
(800) 426-4791

The hotline operates from 9:00 AM to 5:30 PM (EST) The hotline can be accessed on the Internet at <http://www.epa.gov/safewater/drinklink.html>

For more information about your test report please contact the Chemistry Program of the Laboratory Services Division of the Colorado Department of Public Health and Environment at 303-692-3048.

To find out more about your watershed and its ground water visit "Surf Your Watershed" at <http://www.epa.gov/surf> or the "Index of Watershed Indicators" at <http://www.epa.gov/iwi>. These websites can also tell you possible sources of problems. Companies with permits to release their wastewaters in your area are listed; you can see if they meet pollution control laws. You can also learn how your watershed compares to others in the country.

The U.S. Department of Agriculture and EPA support a program to help farmers, ranchers and rural homeowners. Called *Farm*A*Syst* or *Home*A*Syst*, it helps identify and solve environmental problems,

including protecting drinking water. Obtain a copy of the Home*A*Syst questionnaire/checklist that can help you find possible threats to your water supply from:

National Farm*A*Syst/Home*A*Syst Program
303 Hiram Smith Hall
1545 Observatory Drive
Madison, WI 53706
Ph: 608.262.0024, Fax: 608.265.2775
Email for information: homeasys@uwex.edu
<http://www.uwex.edu/homeasyst/>

Another source of information is the National Quality Information Center at <http://www.nal.usda.gov/wqic>

Other sources of information include:

Ground Water Protection Council
<http://www.gwpc.org>

American Water Works Association
<http://www.awwa.org>

National Rural Water Association
<http://www.nrwa.org>

National Drinking Water Clearinghouse
http://www.nesc.wvu.edu/ndwc/ndwc_index.htm

Rural Community Assistance Partnership
<http://www.rcap.org>

U.S. Geological Survey
<http://water.usgs.gov>

U.S. Department of Agriculture Natural Resources Conservation Service
<http://www.nrcs.usda.gov>

Water Systems Council
<http://www.watersystemscouncil.org>

National Ground Water Association, Inc. maintains a private site called Wellowner.org
<http://www.wellowner.org/index.shtml>

Water Hardness

Water hardness does not have a Secondary Maximum Contaminant Level. It is included here, however, because it is a common water quality problem and testing for water hardness is frequently necessary to evaluate and treat other problems. The source is naturally dissolved calcium and magnesium. The symptoms are soap deposits, scaly deposits in plumbing and appliances, and decreased cleaning action of soaps and detergents.

Total Hardness	Description
0 TO 75 mg/L	Soft water
75 TO 150 mg/L	Moderately hard water
150 to 300 mg/L	Hard water
Over 300 mg/L	Very hard water

Glossary

Maximum Contaminant Level (MCL) – The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

Maximum Contaminant Level Goal (MCLG) – The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.

Minimum Detection Limit (MDL) – The lowest concentration of a substance in a sample that can be measured with a known level of confidence.

Milligram/Liter (mg/L) – Part per million. For illustration, one part per million equals: one inch in 16 miles, one minute in two years, or one cent in \$10,000.

National Primary Drinking Water Regulations – Legally enforceable standards that apply to public water systems. Primary standards protect public health.

National Primary Drinking Water Regulations

National Primary Drinking Water Regulations (NP-DWRs or primary standards) are legally enforceable standards that apply to public water systems. Primary standards protect public health by limiting the levels of contaminants in drinking water. Even though federal standards do not apply to household wells, you can use them as a guide to potential problems in your water.

Contaminant	Maximum Contaminant Level	Potential Health Effects from Ingesting Water	Sources of Contaminant in Drinking Water
Antimony	0.006 mg/L	Increase in blood cholesterol; decrease in blood sugar.	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder.
Arsenic	0.010 mg/L as of 01/23/06	Skin damage or problems with circulatory system, and increased risk of cancer.	Erosion of natural deposits; runoff from orchards, runoff from glass & electronics production wastes.
Asbestos (fiber > 10 micrometers)	7 million fibers per liter	Increased risk of developing benign intestinal polyps.	Asbestos cement decaying in water mains; erosion of natural deposits.
Barium	2 mg/L	Increase in blood pressure.	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits.
Beryllium	0.004 mg/L	Intestinal lesions.	Discharge from metal refineries and coal-burning factories; and from electrical, aerospace, and defense industries.
Cadmium	0.005 mg/L	Kidney damage.	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints.

Contaminant	Maximum Contaminant Level (MCL)	Potential Health Effects from Ingesting Water	Sources of Contaminant in Drinking Water
Chromium	0.1 mg/L	Allergic dermatitis.	Discharge from steel and pulp mills; erosion of natural deposits.
Coliform	1.0 cfu/ml	Gastro-intestinal Distress	Naturally occurring in the environment.
Copper	Action Level = 1.3 mg/L	Short term exposure: Gastro-intestinal distress. Long term exposure: Liver or kidney damage. People with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level.	Corrosion of household plumbing systems; erosion of natural deposits.
Cyanide (as free cyanide)	0.2 mg/L	Nerve damage or thyroid problems.	Discharge from steel/metal, plastic and fertilizer factories.
Fluoride	4.0 mg/L	Bone disease (pain and tenderness of the bones); children may get mottled teeth.	Water additive (promotes strong teeth); erosion of natural deposits; discharge from fertilizer and aluminum factories.
Lead	Action Level = 0.015 mg/L	Infants and children: delays in physical or mental development. Adults: kidney problems; high blood pressure.	Corrosion of household plumbing systems; erosion of natural deposits.
Mercury (inorganic)	0.002 mg/L	Kidney damage.	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands.
Nitrate (measured as Nitrogen)	10 mg/L	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.
Nitrite (measured as Nitrogen)	1 mg/L	Same as Nitrate (above).	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.
Selenium	0.05 mg/L	Hair or fingernail loss; numbness in fingers or toes; circulatory problems.	Discharge from petroleum refineries; erosion of natural deposits; discharge from mines.
Thallium	0.002 mg/L	Hair loss; changes in blood; kidney, intestine, or liver problems.	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories.

Radionuclides

Radionuclides are man-made or natural elements that emit radiation and that may cause cancer after many years of exposure through drinking water.

Contaminant	Maximum Con-taminant Level	Potential Health Effects from Ingesting Water	Sources of Contaminant in Drinking Water
Alpha particles	15 picocuries per Liter (pCi/L)	Increased risk of cancer.	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation.
Beta particles and photon emitters	4 milli-rem per year	Increased risk of cancer.	Decay of natural and man-made deposits of certain minerals that are radioactive and may emit forms of radiation known as photons and beta radiation.
Radium 226 and Radium 228 (combined)	5 pCi/L	Increased risk of cancer.	Erosion of natural deposits.
Uranium	0.030 mg/L as of 12/08/03	Increased risk of cancer, kidney toxicity.	Erosion of natural deposits.



National Secondary Drinking Water Regulations

National Secondary Drinking Water Regulations (NSDWRs or secondary standards) are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, states may choose to adopt them as enforceable standards.

Contaminant	Secondary Standard	Symptoms	Sources of Contaminant
Aluminum	0.05 to 0.2 mg/L		
Chloride	250 mg/L	Salty tastes; corroded pipes, fixtures and appliances; blackening and pitting of stainless steel.	Natural minerals; seawater; road salt; fertilizers; industrial wastes and sewage.
Color	15 (color units)		
Corrosivity	Non-corrosive	Pitted or leaking pipes; metallic taste; staining due to lead, copper, iron, or zinc dissolved from plumbing.	Depends on temperature, acidity, hardness, and oxygen content of water.
Foaming Agents	0.5 mg/L	Frothy, cloudy appearance; soapy taste and unpleasant odor.	Household and industrial wastes.
Iron	0.3 mg/L	Brackish color; rusty sediment; bitter metallic taste; brown-orange stains; iron bacteria and discolored beverages.	Natural deposits in rocks and soil; leaching of cast iron pipes in water distribution systems.

Manganese	0.05 mg/L	Brownish color; black stains on laundry and fixtures; bitter taste; altered taste of water-mixed beverages.	Natural deposits in rocks and soil.
Odor	3 threshold odor number	"Rotten egg", septic, musty or chemical smell.	Dissolved gases, minerals, chemicals; leaking underground storage tanks; land-fill or septic runoff; organic matter.
pH	6.5-8.5	Pitting of pipes and fixtures, bitter or metallic taste (low pH); slippery feel, soda taste, scaly deposits (high pH).	Dissolved acid and alkaline materials.
Silver	0.10 mg/L	Agryria, a permanent blue-gray discoloration of skin, mucous membranes and eyes.	Soil, coal, and mineral deposits; ore mining and manufacturing alloys; photographic procedures and jewelry making.
Sulfate	250 mg/L	Bitter medicinal taste; scaly deposits; corrosion; laxative effects; "rotten egg" odor from hydrogen sulfide gas formation.	Natural deposits or salts; byproducts of coal mining; industrial wastes and sewage.
Total Dissolved Solids	500 mg/L	Hardness, scaly deposits; sediment; cloudy, colored water; odor; staining; salty or bitter taste.	Dissolved minerals; iron and manganese.
Zinc	5 mg/L	Metallic taste.	Natural deposits; leaching of galvanized pipes and fittings.