



Montana Environmental Laboratory LLC

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An explanation of the "Complete" drinking water package analytes

Arsenic - (Maximum Contaminant Level = 0.010 mg/L) Occurs naturally in rock and soil. Arsenic is very common in Montana. Some people who drink water with high levels of arsenic could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

Alkalinity - (Should be between 30 to 500 mg/L) The alkalinity of water is a measure of its capacity to neutralize acids. This is due to carbonates and bicarbonates in the water. Waters with an alkalinity higher than 500 may have an objectionable taste.

Antimony - (Suggested Maximum Level = 0.02 mg/L) Can be in well water through erosion of natural deposits. Some people who drink water with high levels could experience intestinal problems.

Barium - (Maximum Contaminant Level = 2 mg/L) Can be in water through erosion of natural deposits. Some people who drink water with high levels could experience increased blood pressure. Almost all groundwater in Montana contains some barium.

Beryllium - (Maximum Contaminant Level = 0.004 mg/L) Can be in water through erosion of natural deposits. Some people who drink water with high levels could experience intestinal lesions.

Cadmium - (Maximum Contaminant Level = 0.005 mg/L) Can be in water from corrosion of galvanized pipe. Some people who drink water with high levels could experience kidney damage.

Calcium - (No Maximum Level) Calcium, along with magnesium, is an essential nutrient and a mineral that commonly causes hard water, which leaves mineral deposits on faucets. Calcium is required by the human body at 1000 mg per day.

Chloride - (Suggested Maximum Level = 250 mg/L, more than 100 mg/L gives a salty taste to water)
When combined with calcium and magnesium, chloride may increase the corrosivity of water.

Chromium - (Maximum Contaminant Level = 0.1 mg/L) Can be in water through erosion of natural deposits. Some people who drink water with high levels could experience allergic dermatitis.

Total Coliform Bacteria - (Maximum Contaminant Level = None Allowed) Coliform Bacteria is present in soil and the feces of all warm blooded mammals, as well as birds and some plants. Coliform is used by the EPA as an indicator of the sanitary quality of a water supply. Coliform bacteria can be an indication of surface water contamination. **E. Coli Bacteria - (Maximum Contaminant Level = None Allowed)** Escherichia Coliform is associated with the presence of feces of warm blooded animals, and is a primary indication of fecal contamination.

Conductivity (Specific Conductance) - (>1000 is considered saline water.) Conductivity is a measurement of the total dissolved minerals in solution, and is also referred to as the salinity, salt content, total mineral content, or alkali content. This is a measure of the total amount of dissolved ions in water. Absolutely pure water has a conductance of zero. Drinking water with a conductivity of less than 400 would be considered excellent. Water with a conductivity over 1,000 may cause mineral build up in the soil of house plants, causing them to turn yellow. Sea water has a specific conductance of over 10,000.

Copper - (Maximum Contaminant Level = 1.3 mg/L) The common source of copper in drinking water is corrosion of copper plumbing. This may be evidenced by green or blue staining in sinks or tubs. Copper is an essential nutrient in small amounts, but some people who drink water with high levels of copper could experience gastrointestinal distress and could suffer liver or kidney disease.

Fluoride - (Maximum Contaminant Level = 4.0 mg/L), (Suggested Maximum Level = 2.0 mg/L) Fluoride is found in many types of rock, and may enter water through erosion of natural deposits. Fluoride in water is very common in Montana. Levels of 0.7 to 1 mg/L are considered effective in preventing dental decay. However, at levels above 2.0 mg/L fluoride can cause mottling or permanent white stains on the teeth. Fluoride above 4.0 mg/L can cause dental or skeletal fluorosis.



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Hardness - (60 mg/L = soft, 80 - 120 = moderate, 120 - 180 = hard, >180 mg/L is very hard) Hardness is mostly made up of calcium and magnesium ions in the water. These ions combine with soap to form a scum. Hard water requires more soap to clean items and soap scum may build up on clothes etc. High levels of hardness can cause scaling to form in hot water heaters. To determine the hardness of your water in grains per gallon, use the following conversion factor: mg/L of hardness divided by 17.1 = grains per gallon of hardness.

Iron - (Suggested Maximum Contaminant Level = 0.3 mg/L) Iron concentrations above 0.3 mg/L can cause "red water" and staining of plumbing fixtures. Although there are no adverse health effects from drinking water with high levels of iron, it can impart an objectionable metallic taste to the water, and cause staining of fixtures and laundry.

Lead - (Maximum Contaminant Level = 0.015 mg/L or 15 ug/L) The common source of lead in drinking water is corrosion of lead or brass plumbing fixtures. Even new plumbing fixtures can contain up to 8% lead. Drinking water with high levels of lead can cause physical or mental developmental problems, learning disabilities, kidney problems, and high blood pressure.

Manganese - (Suggested Maximum Contaminant Level = 0.05 mg/L) Can be in water through erosion of natural deposits. Some people who drink water with high levels could experience adverse neurological effects, resembling a Parkinson's like illness, and reduced IQ in children. Can impart a bitter metallic taste to the water, and cause black or brown staining of fixtures and laundry.

Magnesium - (No Maximum Level) Magnesium, along with calcium, is a mineral that commonly causes hard water.

Mercury - (Maximum Contaminant Level = 0.002 mg/L) Can be in water through erosion of natural deposits, or runoff from crop land or landfills. Some people who drink water with high levels could experience kidney or brain damage.

Nickel - (Suggested Maximum Level = 0.07 mg/L) Can be in water through erosion of natural deposits. Some people who drink water with high levels could experience eczema (skin problems).

Nitrate - (Maximum Contaminant Level = 10 mg/L) An elevated level of nitrate is of concern to families with infants and to the elderly. High nitrate levels can cause a condition called methemoglobinemia ("blue baby syndrome"). This is caused by the nitrate reacting in the intestinal tract to form nitrite. Nitrite will attach to the hemoglobin molecule in the blood, causing a lack of oxygen supply to vital organs. Nitrate contaminates Montana waters more often than any other chemical substance. Nitrate in well water may indicate contamination from agricultural runoff or septic system contamination.

pH - (Should be between 6.5 to 8.5 Units) A measurement to indicate how acidic or basic the water is. pH 7 is neutral. Water with a pH of less than 7 is considered acidic, and may give the water a bitter metallic taste. Green or blue green staining of household fixtures may be indicative of low pH water leaching metals from plumbing pipes. Water with a pH greater than 7 is considered basic and may make the water have a slippery feel, and a soda taste.

Selenium - (Maximum Contaminant Level = 0.05 mg/L) Can be in water through erosion of natural deposits and discharge from mines. Some people who drink water with high levels could experience hair or fingernail loss, numbness in fingers and toes, and circulatory problems.

Sodium - (Guidance Level = 20 mg/L) Sodium is one half of common table salt (sodium chloride). High levels of salt has been associated with hypertension. Softened water typically contains about 200 mg/L of sodium.

Sulfate - (Suggested Maximum Level = 250 mg/L) Sulfate in water containing calcium forms a hard scale in water heaters. In large amounts, sulfate gives a bitter "medicinal" or salty taste to water. Concentrations greater than 250 mg/L may have a laxative effect, but up to 500 mg/L is considered safe. Sulfate can be reduced to hydrogen sulfate which has an objectionable "rotten egg" smell.

Thallium - (Maximum Contaminant Level = 0.0005 mg/L) Can be in water from erosion of natural deposits. Some people who drink water with high levels could experience hair loss, blood, kidney, intestine, or liver problems.

There are many other water quality parameters that can be tested, including many metals, pesticides, herbicides, volatile organic compounds, and radio nuclides. If you have specific water quality concerns, call our lab for prices on other tests.

See http://www.epa.gov/safewater/privatewells/pdfs/household_wells.pdf for more information.