



UNDERSTANDING YOUR WATER QUALITY ANALYSIS

Having your well water tested is an important step to ensure safe drinking water. The U.S. Environmental Protection Agency establishes drinking water standards, such as maximum contaminant levels (MCL) and secondary maximum contaminant levels (SMCL), and public water supplies are required to test their water routinely for a list of regulated contaminants. For private well owners, however, water testing is their responsibility. The following guide is intended to help customers understand the results of their water quality analysis.

Analyte	Description	MCL (or SMCL, if noted)	Source	Websites (for more information)
Alkalinity	Measure of bicarbonate, carbonate, or hydroxide constituents; not detrimental to humans; IDPH recommends 30-400 mg/L for drinking water.		IDPH	http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf
Aluminum	Above the SMCL may result in colored water.	0.05 to 0.2 mg/L	US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm
Arsenic	Naturally occurring in some groundwater throughout Illinois. EPA indicates some people who drink water containing arsenic in excess of the MCL for many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.	0.010 mg/L (=10 µg/L)	ISWS	http://www.isws.illinois.edu/gws/archive/arsenic/ilsources.asp
			US EPA	http://water.epa.gov/drink/contaminants/index.cfm
Barium	Naturally occurring, possible discharge of drilling wastes and metal refineries; erosion of natural deposits. Some people who drink water containing barium in excess of the maximum contaminant level (MCL) for many years could experience an increase in their blood pressure.	2 mg/L	US EPA	http://water.epa.gov/drink/contaminants/index.cfm
				http://water.epa.gov/drink/contaminants/basicinformation/barium.cfm
Beryllium	Naturally enters water through the weathering of rocks and soils or from industrial wastewater discharges. Some people who drink water containing beryllium in excess of the maximum contaminant level (MCL) for many years could develop intestinal lesions.	0.004 mg/L (=4 µg/L)	US EPA	http://water.epa.gov/drink/contaminants/index.cfm
				http://water.epa.gov/drink/contaminants/basicinformation/beryllium.cfm
Calcium	(See hardness)			
Chloride	Naturally occurring; runoff from road deicing; pollution from brine or industrial or domestic wastes; high levels can cause salty taste and be corrosive to iron pipe.	SMCL = 250 mg/L	IDPH	http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf
			US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm
Chromium	Found naturally in rocks, plants; most common forms of chromium that occur in natural waters are trivalent chromium (chromium-3), and hexavalent chromium (chromium-6). Chromium-3 is a nutritionally essential element in humans and is often added to vitamins as a dietary supplement. Chromium-3 has relatively low toxicity and would be a concern in drinking water only at very high levels of contamination; Chromium-6 is more toxic and poses potential health risks (allergic dermatitis, possibly carcinogenic).	0.1 mg/L	US EPA	http://water.epa.gov/drink/contaminants/index.cfm
Color	Visible tint in the water (yellow/tan/brown); can be caused by decaying vegetation.	SMCL = 15 units	US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm
Copper	Short-term = gastrointestinal distress, and with long-term exposure may experience liver or kidney damage. Treatment technique regulation-action level 1.3 mg/L; SMCL = 1.0 mg/L (above SMCL = metallic taste; blue-green staining)	1.3 mg/L; 1.0 mg/L	US EPA	http://water.epa.gov/drink/contaminants/basicinformation/copper.cfm
Fluoride	Commonly added to community supplies (to 1 mg/L) to promote dental health. Excessive consumption over a lifetime may lead to increased likelihood of bone fractures in adults, and may result in effects on bone leading to pain and tenderness. Children may have an increased chance of developing pits in the tooth enamel, along with a range of cosmetic effects to teeth. EPA has both an MCL and a SMCL.	4 mg/L	US EPA	http://water.epa.gov/drink/contaminants/index.cfm
		SMCL = 2 mg/L	US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm

Analyte	Description	EPA MCL or SMCL	Source	Websites (for more information)
Hardness	Generally caused by calcium and magnesium minerals. Affects consumption of soap; causes scale. Generally removed using a water softener. Calcium can form scale when heated. IDPH: The following is a measure of hardness (expressed in mg/L as calcium carbonate): 0 - 100 Soft 100 - 200 Moderate 200 - 300 Hard 300 - 500 Very hard 500 - 1,000 Extremely hard May also be expressed in grains per gallon. The conversion formula is: 1 gpg = 17.1 mg/L.		ISWS	http://www.isws.uiuc.edu/pubdoc/C/ISWSC-118.pdf
			IDPH	http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf
Iron	Naturally occurring as soluble Iron (II), but oxidizes to Iron(III); rusty color; sediment; metallic taste; reddish or orange staining; removed by physical filtration, iron filter, water softener	SMCL = 0.3 mg/L	IDPH	http://www.idph.state.il.us/envhealth/factsheets/ironFS.htm
			IDPH	http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf
			US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm
Magnesium	(See hardness)			
Manganese	Naturally occurring; black to brown color; black staining; bitter metallic taste	SMCL = 0.05 mg/L	US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm
Nickel	No current EPA limit; has potential to cause the following health effects from long-term exposure at levels above the MCL: decreased body weight; heart and liver damage; dermatitis.	Old MCL = 0.1 mg/L	US EPA	http://www.epa.gov/ogwdw/pdfs/factsheets/ioc/tech/nickel.pdf
Nitrate	Often used in fertilizer. Infants below six months who drink water containing nitrate in excess of the maximum contaminant level (MCL) could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome (methemoglobinemia).	10 mg/L as N	US EPA	http://water.epa.gov/drink/contaminants/basicinformation/nitrate.cfm
pH	Low pH: bitter metallic taste; corrosion high pH: slippery feel; soda taste; deposits desirable range = 6.5-8.5	SMCL = 6.5-8.5	US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm
			IDPH	http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf
Sodium	No current federal drinking water standard; high levels may be associated with hypertension in some individuals, but typically the majority of sodium ingestion is from food rather than drinking water. Water softening will increase sodium.		US EPA	http://water.epa.gov/scitech/drinkingwater/dws/ccl/sodium.cfm
Sulfate	Naturally occurring; high levels can cause laxative effect, especially if changing from water supply with low sulfates. Coal mining can contribute. IDPH states: 0-250 mg/L=acceptable; 250-500 mg/L=can be tolerated; 500-1000 mg/L=undesirable; over 1000 mg/L=unsatisfactory	SMCL = 250 mg/L	ISWS	http://www.isws.uiuc.edu/pubdoc/C/ISWSC-118.pdf
			IDPH	http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf
			US EPA	http://water.epa.gov/drink/contaminants/unregulated/sulfate.cfm
Total Dissolved Solids	Measure of the total amount of dissolved minerals/substances in water; high levels may cause salty taste IDPH states: less than 500 mg/L= satisfactory; 500 - 1000 mg/L= less than desirable; 1000-1500 mg/L= undesirable; over 1500 mg/L= unsatisfactory	SMCL = 500 mg/L	US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm
			IDPH	http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf
Turbidity	Turbidity refers to cloudiness of water. Often due to sand, silt, clay, or precipitated iron (see also iron). Turbidity has no health effects, but can be an indication of the presence of disease-causing organisms.	n/a. See EPA website for info	US EPA	http://water.epa.gov/drink/contaminants/index.cfm
Zinc	Metallic taste	SMCL = 5 mg/L	US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm

Notes:

MCL = Maximum Contaminant Level (Set by US EPA and is generally the maximum level allowed for public water systems)

SMCL = Secondary Maximum Contaminant Level (non-mandatory guidelines for aesthetic considerations; generally analyte is not considered a risk to human health)

US EPA = United States Environmental Protection Agency

IDPH = Illinois Department of Public Health

mg/L = milligrams per liter; this is the same as parts per million (ppm)

µg/L = micrograms per liter; this is the same as parts per billion (ppb)

List of all EPA drinking water contaminants: <http://water.epa.gov/drink/contaminants/index.cfm>