2013
CITY OF GOLDEN

Water Quality Report

The City of Golden is committed to providing its customers with safe and dependable drinking water. This is your annual summary of drinking water quality along with updated information about Golden's water treatment plant, water service lines and Clear Creek, our raw water supply. We hope you will find this report useful and welcome any comments you may have. The Environmental Services Division can be reached at 303-384-8181 or, to learn more, go to www.cityofgolden.net/links/EnvironmentalServices.

Clear Creek – Our Mountain Water Source

Golden's drinking water source is predominantly snowmelt from Clear Creek and its tributaries. As it flows through the watershed, it dissolves naturally occurring minerals and, in some cases, radioactive materials from rock surfaces and the riverbed. Water quality in Clear Creek may also be influenced by rock or landslides, run-off from deciduous and evergreen forested areas, animal activity or by substances that are a result of human activity.

Contaminants that may be present in source waters include:

- Bacteria and viruses from wastewater treatment plants, individual septic systems, livestock operations and wildlife.
- Salts and metals from highway/road maintenance and construction operations, mine waste piles, active and abandoned mines or mine cleanup sites, oil and gas production, farming and stormwater runoff.
- Organic contaminants, including synthetic and volatile organic chemicals which are by-products of industrial processes and petroleum production, or may come from petroleum spills from gas stations, traffic accidents or leaking above ground or underground storage tanks.
- Radioactive contaminants that are naturally occurring or can be the result of mining activity or oil and gas production.
- Pesticides, herbicides and nutrients such as nitrogen and phosphorus from residential lawns, agricultural activities or stormwater runoff.

The Colorado Department of Public Health and Environment has provided consumers with a **Source Water Assessment Report** that is specific to Golden's raw water supply. The report is not an indication of the current quality of our water source but provides a screening level evaluation of *potential impacts* to Clear Creek and rates the *possible susceptibility* to those sources. Information from the report is available to Golden to develop and implement water management strategies in order to optimize treatment and protect the quality of our drinking water.

The report is available online at www.cdphe.state.co.us/wq/sw/swaphom.html or may be obtained by contacting the City of Golden Environmental Services Division at 303-384-8181.

Water Quality and Your Health

Do I need a water softener?

Going soft is a decision that every household needs to make on their own.

Hard water can contain relatively high amounts of calcium and magnesium when it comes in contact with rocks and soil - like slow moving Clear Creek. Hard water is perfectly fine to drink and is not considered to be dangerous to one's health. Soft water can also be naturally occurring, or produced with water softening devices that remove the elements that make it hard and replaces them with either sodium or potassium. Soft water has a very pure, although occasionally slightly salty taste. While soft water has esthetic value, it may not be wise to drink it if you are concerned with salt intake in your diet. It is not recommended if you if you are on a low sodium diet or if you have heart or circulatory problems. USGS classifies water hardness like this…

Classification	Hardness in mg/L or ppm
Soft	0-60
Moderately Hard	61-120
Hard	121-180
Very Hard	≥ 181

Generally speaking, the City has harder water in the winter months when the Creek has less flow, and softer water in the spring months when we have higher flows in the Creek due to snow melt. In 2013, the hardness range fluctuated from 37 to 152 mg/L or ppm.

So the answer is… It is a personal preference to decide to add a water softener.

If you do decide to add a water softener, it may be wise to not allow softened water to flow to your outside hose bibs. Using softened water to water your yard would eventually kill your grass and plants.

LEAD – WHAT YOU NEED TO KNOW

Young children and pregnant women are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than other homes in the community as a result of materials used in your home's plumbing. The City of Golden is responsible to provide you with high quality drinking water but cannot control the variety of materials used in water service lines and home plumbing components. You can minimize your exposure by flushing your tap for 30 seconds to 2 minutes before using water for cooking or drinking. If you are concerned about levels of lead in your home, you may wish to have your water tested. Information on lead in drinking water, testing methods and steps you can take to minimize your exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791.

If You Have Special Health Concerns:

Both public and bottled water supplies may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. However, some people may be more vulnerable to contaminants in drinking water than the general population. Immuno - compromised individuals such as such as persons undergoing chemotherapy, persons who have undergone organ transplants, those with HIV/AIDS or other immune system disorders and some elderly and infants can be particularly at risk for infection. These people should seek advice about drinking water from their health care providers. For more information about contaminants and potential health effects, or to receive a copy of the EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium, Giardia or other microbiological contaminants, call the EPA Safe Drinking Water Hotline toll free at **1-800-426-4791**.

2013 Water Quality Monitoring Results

The following tables contain the results of all substances that are regulated by State and Federal law that were detected in Golden's water during the 2013 monitoring period. Most of the monitoring performed by Golden's Environmental Services lab results in non detect levels allowing the City to perform reduced monitoring for substances that pose no risk to our system. Some of those results will show dates that may be more than a year old.

Detected Regulated Substances

Monitored leaving the Water Treatment Plant

For more information, call the Water Quality Lab at 303-384-8181.
Or contact Vicki Coppage at 303-384-8182.

Organic/Inorganic	Sample Date	Average	Range Found	MCL	MCLG	No Violations	Common Sources
Barium, ppm	4-30-13	0.41	n/a	2	2		Natural Erosion
Fluoride, ppm	quarterly	1.04	0.88 - 1.04	4	4		Natural Erosion
Nitrate, ppm	4-25-13	0.17	n/a	10	10		Fertilizer Run-off
*Total Organic Carbon (TOC), ratio *(TOC, reported as a ratio, must remain above 1.0 for optimal water treatment.)*	monthly - RAA	1.39	0.99 - 1.39	TT	TT		Naturally present in the environment

**Golden uses enhanced treatment to remove the naturally occurring organic compounds that can combine with disinfectants to form Disinfectant By-Products. The ratio of TOC removal measures our compliance with this treatment technique.*

Radionuclides	Sample Date	Average	Range Found	MCL	MCLG	No Violations	Common Sources
Combined Radium (226 & 228) pCi/L	2-3-2011	0.1	0.1 - 0.1	5	n/a		Erosion of natural deposits
Gross Alpha Particles pCi/L	2-3-2011	2.7	2.7 - 2.7	15	n/a		Erosion of natural deposits

Turbidity	Sample Date	Result	Treatment Requirement	No Violations	Common Sources
Turbidity, NTU *(Measure of the cloudiness of water. It is a good indicator of the effectiveness of our filtration system)*	6 times per day	highest single reading 0.46 ntu	Maximum of 1.0 ntu at any time		Natural Run-off

Monthly averages must be less than 0.3 NTU for 95% of the time. In Golden, 100% of all monthly averages were less than 0.3 NTU for 2013.

Monitored at consumer taps

Disinfection By-Products	Sample Date	Highest RAA	Average	Range Found	MCL	MCLG	No Violations	Common Sources
Total Trihalomethanes, ppb	quarterly - RAA	41.7	n/a	Total Tri range 20.8 - 64.5	80	n/a		By-product of Chlorination
Total Haloacetic Acids, ppb	quarterly - RAA	12.7	n/a	Total Halo range 7.28 - 20.3	60	n/a		By-product of Chlorination
Chlorine (free), ppm	throughout the year	n/a	0.76	0.54 - 0.93	MRDL 4	MRDLG 4		Drinking Water Disinfectant

Running Annual Average for THM's must be less than 80 ppb. Running Annual Average for HAA's must be less than 60 ppb.

Lead and Copper	Sample Date	Concentration at 90th Percentile	Number of Exceedences at 90th Percentile	AL	No Violations	Common Sources
Lead, ppb	2011-2013	less than 1	0	15		Corrosion of household plumbing
Copper, ppm	2011-2013	0.026	0	1.3		Corrosion of household plumbing

The requirement to monitor for lead and copper at consumer taps has been reduced to once every three years. 30 Golden households were sampled in 2011 and are scheduled to be sampled again in 2014.

Other Monitoring Results *Monitored leaving the Water Treatment Plant*

Substance	Sample Date	Average	Range Found	MCL	SMCL	Common Sources
Alkalinity, ppm	weekly	53.5	21 - 59	n/a	none	Erosion of Natural Deposits
Chloride, ppm	quarterly	27	13 - 47	n/a	250 ppm	Erosion of Natural Deposits
Hardness, ppm	weekly	103	37 - 152	n/a	None	Erosion of Natural Deposits
Iron, ppm	8-21-13	0.002	n/a	n/a	0.3 ppm	Erosion of Natural Deposits
Manganese, ppm	8-21-13	0.0035	n/a	n/a	0.05 ppm	Treatment
pH, su	weekly	8.5	6.9 - 9.6	n/a	6.5 - 8.5 su	Treatment
Potassium, ppm	quarterly	2.3	1.8 - 2.8	n/a	None	Erosion of Natural Deposits
Sodium, ppm	quarterly	23.5	14 - 38	n/a	None	Erosion of Natural Deposits
Sulfate, ppm	quarterly	73	63 - 117	n/a	250 ppm	Erosion of Natural Deposits
(TDS), ppm	monthly	185	83 - 273	n/a	500 ppm	Erosion and Storm Water Runoff
Zinc, ppm	8-21-13	0.02	n/a	n/a	5 ppm	Erosion of Natural Deposits

Glossary of Terms and Definitions

90th Percentile:
The point at which 90 percent of all values fall at or below this level.

Action Limit (AL):
The concentration, which if exceeded, triggers a treatment modification. 90 percent of households tested must be below the AL.

CDC: Centers for Disease Control and Prevention

EPA: U.S. Environmental Protection Agency

FDA: U.S. Food and Drug Administration

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

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.

Maximum Residual Disinfectant Level (MRDL):
The highest level of a disinfectant allowed in drinking water.

Maximum Residual Disinfectant Level Goal (MRDLG):
The level of drinking water disinfectant below which there is no known health risk.

n/a: - not applicable

NTU: nephelometric turbidity unit, used to measure water clarity.

pCi/L: picocuries per liter, used to measure radioactivity.

ppb: part per billion - corresponds to 1 inch in 16,000 miles.

ppm: part per million - corresponds to one inch in 16 miles.

Running Annual Average (RAA):
Annual average based on weekly, monthly or quarterly monitoring.

Secondary Maximum Contaminant Level (SMCL):
Non-enforceable levels that primarily affect the aesthetic quality of drinking water.

Secondary Maximum Contaminant Level Goal (SMCLG):
The desirable goal, but not enforceable.

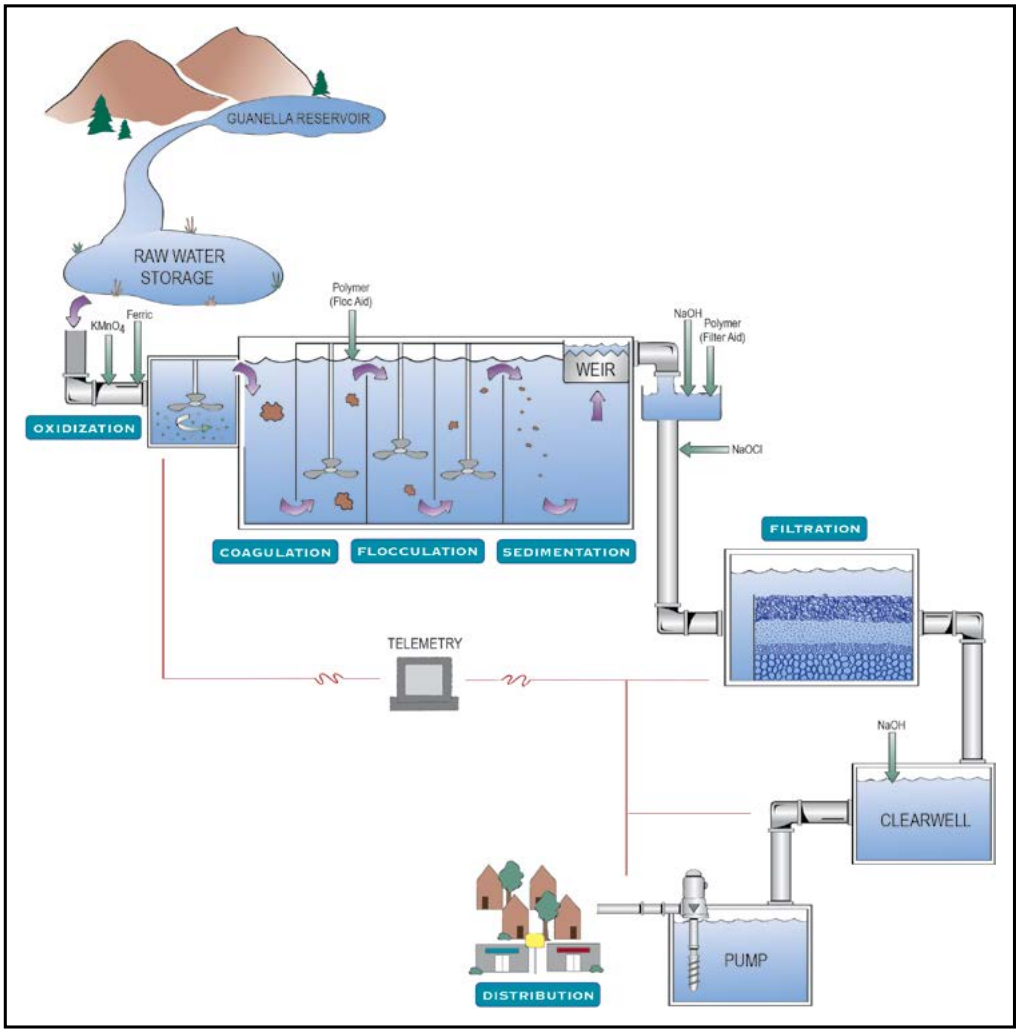
su: standard units

Treatment Technique (TT):
A required process intended to reduce the level of a contaminant in drinking water instead of a MCL.

In order to ensure that tap water is safe to drink, the Colorado Department of Public Health and Environment (CDPHE) prescribes regulations that limit the amount of certain contaminants in the treated water provided by public water systems such as Golden's. The Food and Drug Administration (FDA) sets similar limits for contaminants in bottled water that must provide the same protection for consumers. However, the regulations and testing requirements are much less stringent than for tap water.

Water Treatment

Golden's drinking water supply is diverted from Clear Creek through a remotely controlled gate about a mile up the canyon from the treatment plant. Water flows through a 30 inch pipe, buried under the walking trail, into the two holding ponds on the west side of the plant. Short term storage in these ponds promotes settling of solids before the water is pumped into the treatment basin. Initial treatment (Oxidation) starts immediately before water enters the rapid mix where coagulants are added (Coagulation). This causes dirt and other solids to clump together to form "floc" (Flocculation). As the water moves, the particles get larger and heavier and settle to the bottom of the basin (Sedimentation) where they are removed daily. Clarified water flows to the filtration gallery where six large filters trap all remaining particles leaving the water clear and pathogen free (Filtration). Each filter can process up to 2.5 million gallons per day for a total 15 million gallons per day if necessary. Treated water is stored in the clearwell to optimize disinfection until it is pumped to the nine tanks throughout the City (Distribution). For more on the treatment process, go to the city website at www.cityofgolden.net/government/departments-divisions/water/water-treatment-plant.



The City of Golden has a staff of eight State certified operators and an onsite certified laboratory for water quality testing. The plant is run 24 hours a day, 365 days a year.

The City frequently schedules tours of the Water Treatment Plant.
If you or your group or class are interested, please call 303-384-8186 to make an appointment.

The Importance of Water Distribution System Maintenance

The quality of the drinking water coming from your tap is dependent upon managing and maintaining the distribution system that carries water to your home. Our Utility department is the custodian of drinking water from the point it leaves the plant until it passes through your meter. Staff is responsible for inspection, maintenance and repair of 110 miles of water mains, 5400 water meters, 840 hydrants and 2840 water valves. They also maintain 3 off site reservoirs, nine storage tanks and 14 pump stations as part of their year round list of responsibilities that revolves around water supply, water transmission and water rights administration. The Utilities Division is on-call 24 hours a day, 365 days a year.

Clear Creek Water Line Repair Project

The ice flows in December caused Clear Creek to flow out of its banks in several locations. After the flows receded Golden discovered that the Clear Creek trail west of 6th Avenue that connects the city to JeffCo's Grant Terry Park had been severely eroded and that the City's primary raw water diversion pipeline, which is buried under the trail, had been exposed in two locations. The line remained intact and Golden has an alternative point of diversion closer to the water plant, so the water supply was never in danger, but the pipeline had to be reburied before spring runoff and the high demand irrigation season.

The existence of an endangered species of orchid limited construction activities to the trail itself, creating a construction challenge. Fortunately, good weather, a great contractor, and strong project management resulted in a project that was completed in just under a month – two weeks faster than expected.

Above: Clear Creek trail, before cosntruction.

Right: Clear Creek trail, after repair.

Be a Solution for Pollution

Stormwater runoff is a significant source of pollution for creeks, rivers, lakes and reservoirs. Pollutants have harmful effects on drinking water supplies, recreation and wildlife. Stormwater is conveyed through a drainage system separate from wastewater and is not treated before it drains into a waterway. Since there is no treatment plant for stormwater, its treatment is up to each of us.

Below are some common sources of pollution that are transported by stormwater and steps everyone can take to improve water quality:

- **Grass clippings** Leave grass clippings on the lawn to return nutrients to the soil. Direct mowers so grass clippings fall onto the lawn, not onto the street, sidewalk or driveway.
- **Excess fertilizer** Test your soil to determine if fertilizer is needed. Follow label directions and use the minimum amount to accomplish the job.
- **Leaks from vehicles** Keep vehicles well-maintained. Repair leaks as soon as they are noticed. Use absorbent to clean up leaks when they occur – don't forget to sweep up and dispose of absorbent.
- **Household chemicals** Use less toxic alternatives whenever possible and dispose of unwanted chemicals properly. Call the Rooney Road Recycling Center at 303-316-6262 for an appointment to dispose of old or unused household chemicals.
- **Pet waste.** Remember to carry a bag with you to pick up after your dog and routinely clean up pet waste in the yard– always dispose of waste in the trash.
- **Soil Minimize** erosion from downspouts and bare areas by landscaping or mulching. Store soil and mulch for landscape projects off the sidewalk or street and use them as soon as they're delivered.

For more information, contact:

City of Golden
PUBLIC WORKS DEPARTMENT
ENVIRONMENTAL SERVICES DIVISION

1445 10TH ST. GOLDEN, CO 80401
303-384-8181
WWW.CITYOFGOLDEN.NET/
LINKS/ENVIRONMENTALSERVICES

The City of Golden is an active member of the Upper Clear Creek Watershed Association – a management agency dedicated to protecting the water quality in Clear Creek.

INFORMACIÓN IMPORTANTE ACERCA DE LA CALIDAD DEL AGUA

Para recibir la versión en español del Reporte de Calidad de Agua de 2012 de City of Golden, visite www.cityofgolden.net/links/CalidaddeAgua.