2012
CITY OF GOLDEN

Water Quality Report

The City of Golden is committed to providing its customers with healthy and dependable drinking water. This is your annual summary of drinking water quality along with updated information about Golden's water transmission system and current news about our raw water supplies. 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

Water Quality Monitoring

Every year, Golden's Water Quality Lab performs thousands of tests to ensure that your drinking water is safe. It's the law. We also test for many other *unregulated* parameters and those results are used by the water plant operators to optimize treatment and produce a better quality product. The information also gives us a better indication of the quality of water going to your taps. **This is good news for those who have aquariums, are home brewers or just want to know what else is in the water we use and drink.** Here are some of the additional parameters we monitor:

- Sodium – The 6th most abundant element on earth, sodium is most commonly found in the compound sodium chloride. In very high concentrations, sodium chloride can give water a bitter salty taste.
- Chloride – High levels of chloride can give water an unacceptable odor and can contribute to a salty taste. The EPA has set a secondary maximum contaminant level (SMCL) for chloride at 250 mg/L.
- Potassium – Also forms a salt; potassium is an important component to plant and human nutrition.
- Total Dissolved Solids (TDS) – Solids that are dissolved in water and are not removed through treatment, can give drinking water an inferior taste. The EPA has set a SMCL for total dissolved solids at 500 mg/L.
- Sulfate – Sulfate containing compounds are abundant in nature and can also cause taste and odor problems in a drinking water supply. The EPA has also set a SMCL for sulfate at 250 mg/L.

We have never seen extremely elevated levels of these "secondary" contaminants in Clear Creek, and we only see small amounts in our finished drinking water (see p. 4 for results).

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**.

2012 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 2012 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	4-25-12	0.026	n/a	2	2		Natural Erosion
Fluoride, ppm	quarterly	0.58	0.52 - 0.65	4	4		Natural Erosion
Nitrate, ppm	4-25-12	0.18	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	1.42	0.68 - 1.82	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 0.44 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 2012.

Monitored at consumer taps

Disinfection By-Products	Sample Date	Average	Range Found	Highest RAA	MCL	MCLG	No Violations	Common Sources
Total Trihalomethanes, ppb	quarterly - RAA	39.7	Tot. Tri range 22.1 - 43.2	50.1	80	n/a		By-product of Chlorination
Total Haloacetic Acids, ppb	quarterly - RAA	13.9	Tot. Halo range 7.42 - 18.38	14.23	60	n/a		By-product of Chlorination
Chlorine (free), ppm	throughout the year	0.93	0.35 - 1.3	n/a	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	38	25.54	n/a	none	Erosion of Natural Deposits
Chloride, ppm	4-25-12	23	n/a	n/a	250 ppm	Erosion of Natural Deposits
Hardness, ppm	weekly	101	46 - 152	n/a	None	Erosion of Natural Deposits
Manganese	4-25-12	0.015	n/a	n/a	0.05 ppm	Treatment
pH, su	daily	8.5	7.7 - 8.9	n/a	6.5 - 8.5 su	Treatment
Potassium, ppm	4-25-12	2.5	n/a	n/a	None	Erosion of Natural Deposits
Sodium, ppm	4-25-12	22	n/a	n/a	None	Erosion of Natural Deposits
Sulfate, ppm	4-25-12	80	n/a	n/a	250 ppm	Erosion of Natural Deposits
(TDS), ppm	monthly	195	123 - 156	n/a	500 ppm	Erosion and Storm Water Runoff
Zinc, ppm	4-25-12	0.04	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

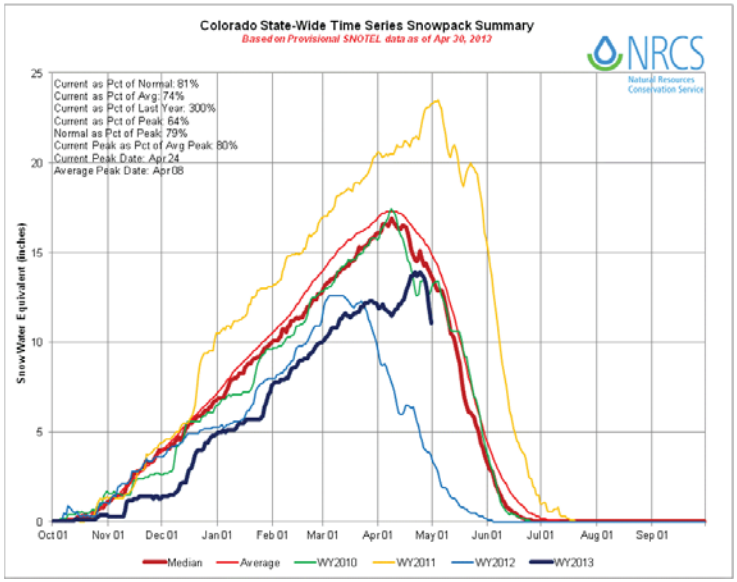
Treatment Technique (TT):
A required process intended to reduce the level of a contaminant in drinking water instead of a MCL.

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 Supply and Infrastructure

Golden's Water: This is where it all begins

Golden's water supply is a renewable natural resource that is virtually all from snowpack. The annual amount of snowpack is highly variable from year to year and the last couple of years have been brutal. To understand the extent of that variability just compare the June 1, 2011 snowpack of 308% to June 1, 2012 snowpack of 3%. A more graphical representation of the variable snowpack plus a look at where we are this year is presented in the graph below:



Spring and summer rains contribute very little to our actual water supply due to their short duration. However they significantly impact the demand that may be needed from storage in our reservoirs. Golden has three storage reservoirs which impound a total of 2,907 Acre Feet of water (one Acre Foot = 325,851 gallons). We fill our reservoirs during the winter and spring so that we have water available in late summer and fall after the runoff from snowmelt has ended.

The lack of snowpack in 2012 meant that Golden had to release about 14% of our storage or a little over 400 Acre Feet of water to fulfill our customers' needs. We were subsequently able to refill our reservoirs over the winter so that this year, even if the snowpack is considerably less, we will have plenty of water to supply our customers.

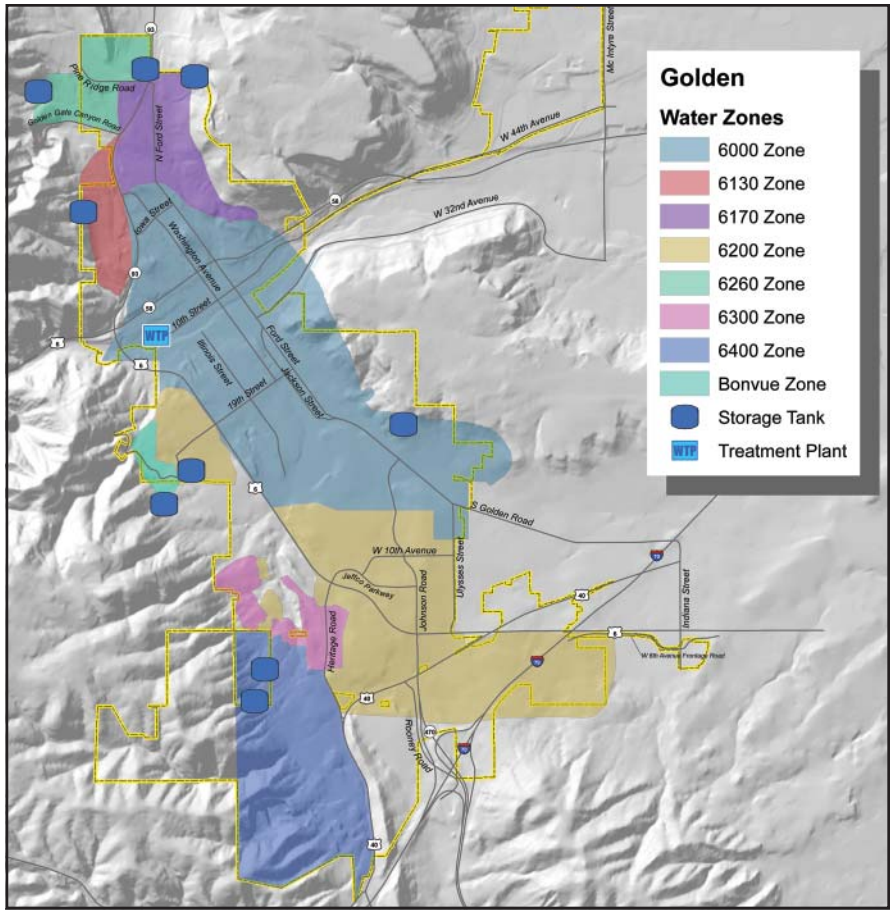
Golden has invested substantially in water rights and infrastructure to assure we will have enough water for future generations as well as developing a City-wide culture of wise and efficient use of this most precious renewable resource.

Are You Interested? If you are interested in the details of our raw water supply, go to www.cityofgolden.net/links/WaterSupply. You can access real time data on flows and water depths at the Urad Reservoirs, Guanella Reservoir and Vidler Tunnel.

Want to know where your neighborhood water tank is?

The map (right) shows the eight different water zones that serve drinking water to all of Golden's customers. Because Golden has many different elevations, multiple tanks are situated at differing altitudes in order to provide enough water pressure to all households. Golden's water supply relies on gravity and a system of pumps to move water to your home. Questions? Call us at 303-384-8181.

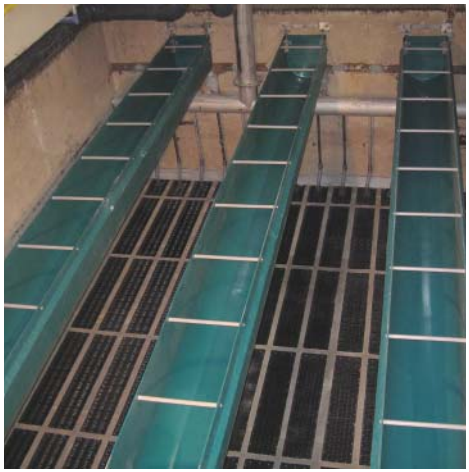
(Above) South Tank - before. (Below) South Tank - after.

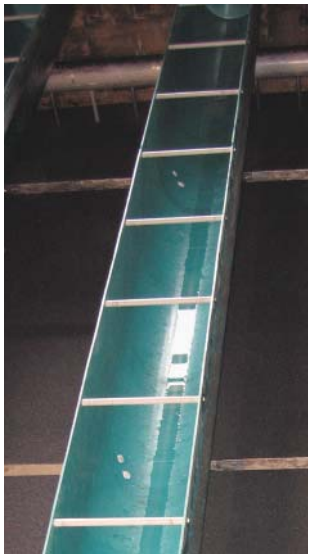


New South Reservoir Wins an Award

The newly completed two million gallon South Reservoir, located in the Beverly Heights area, has won an American Public Works Association award for engineering design. The new tank replaces an old oversized tank that had exceeded its life cycle. Because of its smaller size, water will move through the tank in less time than the old reservoir resulting in improved water quality for households in the 6,000 pressure zone. The design also called for the tank to be buried resulting in a significant increase in available space for future neighborhood park expansion. The photos show the before and after aerial view of this very successful city water project.

Water Treatment Plant News





The City is upgrading the six filtration beds that are the final part of the process at the water treatment plant. This substantial investment will increase treatment efficiency resulting in a higher quality of water sent to all households in Golden.

Consumer Tips

- Your hot water tank will operate more efficiently if you flush it out once per quarter.
- Don't use hot water for cooking. Water from the tank can contain sediments from continuous heating – another good reason to flush the tank periodically.
- Water heating accounts for approximately 19% of home energy use. Replacing old water heaters, dishwashers and clothes washers with new high efficiency appliances can save a household of four as much as $200 per year.
- Homes with automatic sprinkler systems can use 50% more water than those without. Make sure they are programmed correctly and are pointed in the right direction.
- Be water conservative – it can save you money. Water efficient faucets, toilets and showerheads can save up to 20,000 gallons per year. Landscaping that incorporates low water or drought resistant plants and shrubs can reduce watering by half.

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.

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.

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

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.