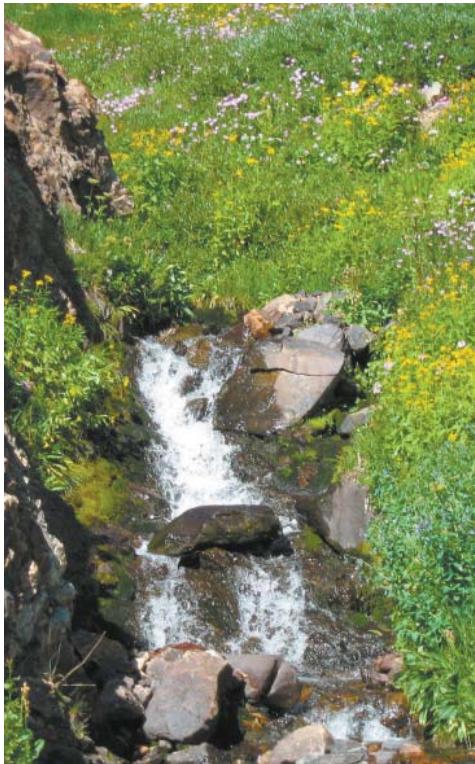




2010
CITY OF GOLDEN

Water Quality Report

The City of Golden is committed to providing its customers with a healthy and dependable drinking water supply. Along with an annual summary of your water quality, we try to provide updated information about the water you drink every day, what's new for drinking water regulations and current information about your water supply source. 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 and click on the Environmental Services Division.



Chromium in the News

Chromium is one of several contaminants that are regulated by the Safe Drinking Water Act and you may have seen some recent news about the presence of high levels of chromium in a small number of U.S. drinking water supplies. Chromium in water can be in the "trivalent" form which is non-toxic or in the "hexavalent" form which is a carcinogen. All forms of chromium occur naturally in rock formations and, if detected in small amounts, it is usually from this natural source. However, elevated hexavalent chromium levels found in drinking water supplies as reported this past December in an environmental study, usually are linked to industrial activity. This has prompted the Environmental Protection Agency (EPA) and some states to review the current regulation for chromium.

The good news is the American Water Works Association reports there is nearly universal compliance nationwide to the current "total" chromium standard (both forms combined) and that includes Golden. In the past 20 years, the Environmental Services Laboratory has never detected any level of chromium in our drinking water supply (Clear Creek) or in our treated water supply.

If you would like to learn more about hexavalent chromium or the 2010 study done by the Environmental Working Group please call the lab at 303-384-8181.

What About Lead?

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 for providing 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.

Water Quality and Your Health

Facts on Fluoride

Fluoride is one of the earth's naturally occurring elements. It can be found in varying amounts in soil, water, plants and most foods.

Most people are exposed to fluoride in their drinking water or it can be topically applied by using fluoride toothpaste and dental rinses or by receiving a fluoride application at your dentist's office.

Fluoride concentrates in the growing bones and developing teeth of children and helps to harden the enamel on teeth before they emerge. Fluoride also helps to repair the early stages of tooth decay. However, high levels of fluoride exposure for extended periods of time may cause dental fluorosis, a discoloration of tooth enamel. It may also cause bone weakening and joint stiffness and pain.

THE MAXIMUM CONTAMINANT LEVEL FOR FLUORIDE

The Safe Drinking Water Act has set the Highest Maximum Level for fluoride in drinking water supplies at 4.0 mg/l or ppm. This maximum level is based on risk to human health. They also set a Secondary Maximum Contaminant Level at 2.0 mg/L as a non-enforceable guideline for regulating contaminants that may cause cosmetic or aesthetic effects such as skin or tooth discoloration. This secondary level for fluoride is based on balancing the beneficial effects of protection from tooth decay and the undesirable cosmetic effects of excessive exposure to fluoride.

It has long been recommended that drinking water plants maintain a fluoride level between 0.7 mg/L to 1.2 mg/L but now that is currently under review. Because Americans now have more access to sources of fluoride than they had before, in January 2011, the U.S. Department of Health and Human Services recommended that water producers maintain a level right at 0.7 mg/L.

The good news is the average annual fluoride level in Golden's drinking water supply is 0.67 mg/L. The fluoride present in our water is all naturally occurring, and is sufficient enough to meet the new recommendation.

One added note: Consumers should be aware that bottled water may not have a sufficient amount of fluoride or any at all. Bottled water is regulated by the Food and Drug Administration (FDA) and they do not require bottled water manufacturers to list the fluoride content on the label. If the fluoride content does not appear on the label, contact the company and ask. **Or, better yet, our recommendation is to drink tap water.**

For more information on fluoride, visit the City of Golden website at <http://ci.golden.co.us/Page.asp?NavID=999>.

If You Have Special Health Concerns:

Because not all contaminants can be completely eliminated, all drinking water, including bottled water, 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.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised individuals 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 and other microbiological contaminants, contact the EPA Safe Drinking Water Hotline toll free at **1-800-426-4791**.

2010 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 2010 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.

Organic/Inorganic	Sample Date	Average	Range Found	MCL	MCLG	No Violations	Common Sources
Barium, ppm	4-20-10	0.035	n/a	2	2		Natural Erosion
Fluoride, ppm	monthly	0.5	0.35 - 0.68	4	4		Natural Erosion
Nitrate, ppm	4-20-10	0.22	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	1.54	1.12 - 1.94	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.

Turbidity	Sample Date	Result	Treatment Requirement	No Violations	Common Sources
Turbidity, NTU <i>(Measure of the cloudiness of water. It is a good indicator of the effectiveness of our filtration system)</i>	6 times per day	highest single reading 0.28 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 turbidity measurements were less than 0.3 NTU for 2010.

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	44.7	25.4 - 61.7	50.1	80	n/a		By-product of Chlorination
Total Haloacetic Acids, ppb	quarterly - RAA	13.6	2.5 - 21.4	14.23	60	n/a		By-product of Chlorination
Chlorine (free), ppm	throughout the year	0.94	0.47 - 1.51	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	2008-2010	< 2	0	15		Corrosion of household plumbing
Copper, ppm	2008-2010	0.039	0	1.3		Corrosion of household plumbing

The requirement to monitor for lead and copper at consumer taps has been reduced to once every 3 years. 32 Golden households were sampled in 2008 and are scheduled to be sampled again in 2011.

Other Monitoring Results

Monitored leaving the Water Treatment Plant

Substance	Sample Date	Average	Range Found	MCL	SMCL	Common Sources
Hardness, ppm	weekly	99	33 - 159	n/a	None	Erosion of Natural Deposits
Potassium, ppm	4-20-10	3.5	n/a	n/a	None	Erosion of Natural Deposits
Zinc, ppm	4-20-10	0.046	n/a	n/a	5	Erosion of Natural Deposits
Sodium, ppm	4-20-10	28.7	n/a	n/a	None	Erosion of Natural Deposits
Chloride, ppm	4-20-10	39.8	n/a	n/a	250	Erosion of Natural Deposits
Sulfate, ppm	4-20-10	96	n/a	n/a	250	Erosion of Natural Deposits
pH, su	daily	8.5	7.9 - 9.1	n/a	6.5 - 8.5	Treatment

Laboratory staff performs hundreds of drinking water tests on a daily, weekly, monthly and annual basis. Samples are taken in Clear Creek, through every step of the treatment process and at consumer taps.

Glossary of Terms and Definitions

90th Percentile:

The point at which 90% of all values fall at or below this level.

Action Limit (AL):

The concentration, which if exceeded, triggers a treatment modification. 90% 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.

Clear Creek - Our Drinking Water Source

Golden's drinking water source is exclusively 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 aboveground or underground storage tanks.
- Radioactive contaminants that are naturally occurring or can be the result of mining activity or oil and gas production.
- Pesticides and herbicides 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.

If I Fertilize My Lawn, Will the Creek Grow?

Some things we do at home, even if located far from the Creek, can impact water quality. Runoff from rain or sprinkler overspray will likely end up in Clear Creek, untreated, via the storm sewer system. Runoff washes pollutants to the Creek and can impact water quality.

Excess Nutrients

Threaten Water Quality

Nutrients are essential for plant growth. But when fertilizers are applied in excess of what plants require, the excess is washed into local streams by runoff. Excess nutrients can cause algae to grow in streams, decrease oxygen levels and cause taste and odor problems in drinking water.

Do Your Part

Test your soil and apply only what's lacking - local soils typically have sufficient phosphorus. Grass clippings and leaves can be an excellent source of nutrients, as long as they're left on your lawn. Or add them to your compost. Controlling erosion is another step in preventing excess phosphorus from affecting water quality.

Special Care of Streamside Property

If you live next to a stream or ditch, it's particularly important to prevent erosion and to maintain a buffer or natural area along the water's edge. Avoid storing soil, grass clippings, piles of leaves and branches where they can be washed into the stream.

With the growing season upon us, please do your part to keep Clear Creek clean.

The Environmental Pilot Class

Continues to Provide Education and Research Benefits to the Colorado School of Mines and Golden

A few years ago, the Colorado School of Mines (CSM) Environmental Science and Engineering (ESE) Division and the City of Golden partnered to create the Integrated Environmental Teaching Laboratory (IETL). Through this program a pilot-scale water treatment system was built within the City of Golden's water treatment plant. The pilot system simulates the operations of the full plant and allows both students and city staff to test innovative technologies and alternative treatment techniques to improve Golden's water quality.

Every spring semester, a group of up to ten CSM graduate students is introduced with a real water quality problem that the City's water treatment plant experienced or anticipates. Working with their professors and plant staff, the students develop an engineered solution and an experimental plan to solve the water quality problem. The students upgrade/modify the pilot plant and operate it continuously (24/7) for up to six weeks – generating ample data that helps City engineers and managers to make informed decisions on future improvements to the City's water treatment plant. In recent years, the students also designed, constructed, and successfully tested a pilot-scale membrane filtration system – an advanced technology that in the future might replace the City's current conventional treatment process.

The plant recently upgraded to automatically control the operation and maintenance of the filters, and will soon replace the filter media (sand and anthracite coal). This year, a group of eight CSM students, led by Professor Tzahi Cath, have taken a very challenging task to design and build four new and improved filter columns and upgrade the pilot



plant's control system. Their target is to substantially reduce the concentrations of both manganese and disinfection byproducts in the drinking water that Golden provides to its customers.

"The engineering and hands-on experiences that the students gain are invaluable," says Professor Cath. "Although the students have to devote many hours at the plant, including nights and weekends, they rate it as one of their most favorite classes." Employers

of CSM/ESE alumni also praise the experience that this type of course provides to young engineers. "One of the greatest benefits of this class," adds Professor Cath, "is the opportunity that graduate students have in working closely and interacting with plant operators – professionals with years of experience and knowledge that can help engineers design better treatment plants for the future."

For additional information about the CSM's Environmental Science and Engineering program, visit their website at <http://ese.mines.edu/>.

Water Plant Update

In 2010 the water plant continued to upgrade equipment. We upgraded the sludge collection system and controls, installed a new flow meter to monitor backwash flows and put in new chemical storage tanks. We automated many of the redundant procedures such as backwashing filters with a new Supervisory Control and Data Acquisition (SCADA) system and replaced the filter flow meters and the filter effluent valves. Many upgrades are scheduled for 2011 as well.

*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.

Interested in the details of our raw water supply? To access real time data on flows and water depth at the Urad Reservoirs, Guanella Reservoir and Vidler Tunnel go to www.cityofgolen.net and click on Public Works/Water Supply.

For more information, contact:



**City of
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