

2017

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/DrinkingWater.

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, runoff 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. They may also 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 <https://wqcdcompliance.com/ccr> or may be obtained by contacting the City of Golden Environmental Services Division at 303-384-8181.

Water Quality and Your Health

Facts on Lead in Drinking Water

In drinking water, lead comes from lead service lines running from the water main in the street to the home and from plumbing inside the home. For the City of Golden, historic city ordinances document the installation of lead service lines starting in 1879 and ending in 1937. In addition to lead service lines, the EPA suspects homes built before the 1986 ban of lead-use in plumbing materials are more likely to have lead pipes, fixtures and solder.



Lead from these plumbing materials can leach into drinking water when water is corrosive. Corrosive water occurs when it has the wrong pH or when it does not contain enough dissolved solids. The City of Golden has a corrosion control program that prevents corrosive water from being sent out into the distribution system. We constantly monitor pH, alkalinity, hardness, temperature and various other water quality characteristics to ensure corrosion control is correctly and consistently implemented. The City also conducts annual lead and copper monitoring in the water distribution system to validate our corrosion treatment is adequate.

Lead and copper samples are taken at the plant and out in the community at 32 designated sampling sites. To select sites, we target homes that are likely to have or have lead plumbing materials. Since the Lead and Copper monitoring rule went into effect in 1991, the City has not had a single exceedance for lead and copper. Water treated here has been carefully balanced before entering the system.

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 or at www.epa.gov/safewater/lead.

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 the 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 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** or visit <http://water.epa.gov/drink/contaminants>.

2017 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 2017 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 Stephanie Crabtree at 303-384-8184.

Organic/Inorganic	Sample Date	Average	Range Found	MCL	MCLG	No Violations	Common Sources
Barium, ppm	Quarterly	0.036	0.03 - 0.04	2	2		Natural Erosion
Fluoride, ppm	Quarterly	0.598	0.38 - 0.8	4	4		Natural Erosion
Nitrate, ppm	Quarterly	0.21	0.11 - 0.42	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	1.45	1.08 - 1.99	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 disinfection 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	7-12-2017	<1.1	<1.1 - <1.1	15	n/a		Erosion of natural deposits
Combined Uranium pCi/L	7-12-2017	<0.7	<0.7 - <0.7	20	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 0.452 ntu	Maximum of 1.0 ntu at any time		

Turbidity must be less than 0.3 NTU for 95% of measurements taken each month.

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	62	39.23	Total Range 19.9 - 62	80	n/a		By-product of Chlorination
Total Haloacetic Acids, ppb	quarterly RAA	11.4	9.44	Total Range 4.8 - 11.4	60	n/a		By-product of Chlorination
Chlorine (free), ppm	throughout the year	n/a	0.8	0.64 - 0.95	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	2017	1	0	15		Corrosion of household plumbing
Copper, ppm	2017	0.06	0	1.3		Corrosion of household plumbing

Starting in 2017, The City of Golden is now required to monitor for lead and copper at consumer taps once a year. 32 Golden households were sampled in 2014 and 33 were sampled in 2017.

Other Monitoring Results *Monitored leaving the Water Treatment Plant*

Substance	Sample Date	Average	Range Found	MCL	SMCL	Common Sources
Alkalinity, ppm	weekly	37.2	21 - 52	n/a	none	Erosion of Natural Deposits
Chloride, ppm	quarterly	34.3	8 - 66	n/a	250 ppm	Erosion of Natural Deposits
Hardness, ppm	weekly	108	34 - 167	n/a	None	Erosion of Natural Deposits
Iron, ppm	quarterly	0.004	0.002 - 0.013	n/a	0.3 ppm	Erosion of Natural Deposits
Manganese, ppm	quarterly	0.008	0.004 - 0.013	n/a	0.05 ppm	Treatment
pH, su	weekly	8.3	6.6 - 8.8	n/a	6.5 - 8.5 su	Treatment
Potassium, ppm	quarterly	2.7	1.1 - 3.8	n/a	None	Erosion of Natural Deposits
Sodium, ppm	quarterly	28.1	11.2 - 40.6	n/a	None	Erosion of Natural Deposits
Sulfate, ppm	quarterly	79.2	34 - 112	n/a	250 ppm	Erosion of Natural Deposits
(TDS), ppm	monthly	224	92 - 322	n/a	500 ppm	Erosion and Storm Water Runoff
Zinc, ppm	quarterly	0.06	0.02 - 0.1	n/a	5 ppm	Erosion of Natural Deposits

If you have any questions, please contact the Water Treatment Plant
at 303-384-8187 or online at www.cityofgolden.net/WTP.



Glossary of Terms and Definitions

- **Maximum Contaminant Level (MCL) –**
The highest level of a contaminant allowed in drinking water.
- **Treatment Technique (TT) –**
A required process intended to reduce the level of a contaminant in drinking water.
- **Health-Based –**
A violation of either a MCL or TT.
- **Non Health-Based –**
A violation that is NOT a MCL or TT.
- **Action Level (AL) –**
The concentration of a contaminant which, if exceeded, triggers treatment and other regulatory requirements.
- **Maximum Residual Disinfectant Level (MRDL) –**
The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- **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 Goal (MRDLG) –**
The level of a drinking water disinfectant, below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- **Violation –**
Failure to meet a Colorado Primary Drinking Water Regulation.
- **Formal Enforcement Action –**
Escalated action taken by the State (due to the risk to public health, or number or severity of violations) to bring a non-compliant water system back into compliance.
- **Variance and Exemptions (V/E) –**
Department permission not to meet a MCL or treatment technique under certain conditions.
- **Gross Alpha –**
Gross alpha particle activity compliance value. It includes radium-226, but excludes radon 222, and uranium.
- **Picocuries per liter (pCi/L) –**
Measure of the radioactivity in water.
- **Nephelometric Turbidity Unit (NTU) –**
Measure of the clarity or cloudiness of water. Turbidity in excess of 5 NTU is just noticeable to the typical person.
- **Compliance Value –**
Single or calculated value used to determine if regulatory contaminant level (e.g. MCL) is met. Examples of calculated values are the 90th Percentile, Running Annual Average (RAA) and Locational Running Annual Average (LRAA).
- **Average (x-bar) –**
Typical value.
- **Range (R) –**
Lowest value to the highest value.
- **Sample Size (n) –**
Number or count of values (i.e. number of water samples collected).
- **Parts per million = Milligrams per liter (ppm = mg/L) –**
One part per million corresponds to one minute in two years or a single penny in \$10,000.
- **Parts per billion = Micrograms per liter (ppb = ug/L) –**
One part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.
- **Level 1 Assessment –**
A study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.
- **Level 2 Assessment –**
A very detailed study of the water system to identify potential problems and determine (if possible) why E. coli MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.
- **Not Applicable (N/A) –**
Does not apply or not available.

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.



Aquahawk & the Switch to Monthly Billing

AquaHawk Alerting is a FREE service for City of Golden customers that will assist them in efficiently managing their water usage and lowering their monthly bills. This new software system is available as part of the recent city-wide meter upgrade. If you have had a new meter installed within the last year, register today - it's easy!

WHY USE THE WATER USAGE MONITORING SYSTEM?

- View consumption over a period of time - see your water consumption



- down to the hour.
- Recognize possible leaks more quickly.
- Take control of your water use. With AquaHawk you don't have to wait for your bill to see how much water you use for everyday activities. Once you are registered, the City can reach out to you if they see something unusual in your usage.

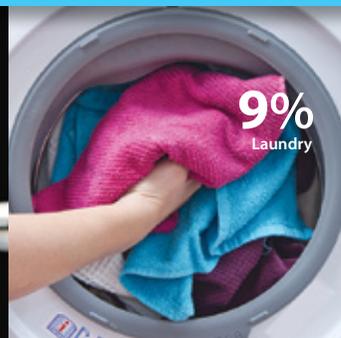
- Set your own personal thresholds and receive text or email alerts.

Learn more on our Water Monitoring Use Page at www.cityofgolden.net/AquaHawk. From there you can register for a free account. All you need is your name, email address and your water account number in this format: 00-000000-000.

With this water meter upgrade, the more timely information on water usage will allow the City to transition from quarterly billing to monthly billing.



How much water am I using?



Golden's Water Treatment Ponds

Every year, the City of Golden Water Treatment Plant invests in the Plant through capital improvement projects. These projects are a result of long range planning to address large scale maintenance and upgrades. Some capital improvement projects that occurred in 2017 included updating the chemical feed system, replacing the roof, and dredging one of two raw water storage ponds. Dredging removes sediment from the pond bottom and restores storage capacity.

The ponds were last dredged in 2010 and since then, the Plant has treated nearly 1 trillion gallons of drinking water. The west pond that was dredged in 2017 is the first diversion point from Clear Creek. Therefore, the west pond contains the larger, heavier organic and inorganic matter consisting of sand, silt, clay, and plant debris. Since these materials are heavier than water, they quickly settle out.

It is estimated that raw water storage was increased by five acre feet as a result



of dredging. In 2019, the maintenance plan includes dredging the east pond, located between the west pond and the Plant. It is expected that finer sediment has collected in the east pond and its removal will increase the raw water pond storage by another five acre feet.

Maintaining raw water storage capacity is important for resiliency. The ponds provide a backup supply if the intake from Clear Creek needs to be shut down.

Sometimes this occurs for scheduled maintenance or repairs. Sometimes the intake needs to be closed when there is a car accident in the Canyon, or even when a heavy rain event affects the water quality in Clear Creek. During these times, the Plant can continue to treat and produce water even if it is not actively diverting from Clear Creek. Golden's raw water ponds are truly an invaluable asset to the City of Golden.



Meet the City of Golden Utilities Crew Members

LES MAJOR is the Utilities Superintendent that holds Level 4 Distribution and Collection Systems certifications from the State of Colorado. He has worked for the City of Golden for 27 years in the Utilities and Engineering Divisions. He enjoys camping and fishing with family and friends. Les grew up in Golden and can remember attending the movie theatre at 13th and Washington as a child.

MARK D. WILLIAMS has been the Utility Supervisor for the City of Golden for 13 years. Mark has been in the utilities industry for 35 years and holds Level 4 Distribution and Collection Systems Certifications from the State of Colorado. He holds a Class D Water Operator Certification from CO as well. Mark has a BA in Management and HR Management. When not at work Mark enjoys hunting and golfing.

WILL STAMBAUGH is the Water Resource Specialist and holds Level 4 certificates in Water Distribution, Wastewater collection, and a Class D certificate in Water treatment. He has a degree in Mechanical Engineering plus extra course work in Environmental Science. He has worked for Golden for 16 years and enjoys canoeing, backpacking, and music.

BRIAN MATZKE is a Senior Maintenance worker, and has been in the water distribution and wastewater collection field for about 18 years. He was a foreman for five and a half years in the state of Idaho and has been with the City of Golden as a Sr. Maintenance worker for almost 13 years. Brian holds a Level 4 Distribution, Level 4 Collections, Class D Water treatment, and a Class D Wastewater Treatment certifications with the State of Colorado. Brian likes to work on his old truck and motorcycles, and loves to ride snowmobiles and go camping and



Front: (from left to right) Brad Hicks, Ruben Barragan, Les Major, Matt Friedrich, Mark Williams. Back: Mark Langanke, Will Stambaugh, Gilberto Mendez, Keith Mehls, Brian Matzke.

fishing. He has lived in the area most of his life and attended and graduated from Golden High School.

BRAD HICKS is a Senior Maintenance worker and has been at the City for three years. He has a wife and two children and enjoys walking around Golden in his spare time.

GILBERTO MENDEZ is a Senior Maintenance worker and has been with the City for seven years. He has a Level 4 Certification for both Collections and Distribution. When not at work he enjoys spending time with his four children.

KEITH MEHLS is the Meter Tech for the City of Golden and has been working here for seven years. He has his Level 2 Distribution license and a Level 1 in Collections. He is an avid bow hunter, angler, and a family man with three kids.

MARK LANGANKE is the Cross Connec-

tion Coordinator and has been with the City for three years. He has a Level 2 Distribution and Collections License and is an ABPA Certified Backflow Tester, Technician, and Surveyor. Mark is a Colorado native and enjoys hiking, snowboarding and camping.

MATT FRIEDRICH has a degree in Political Science. He recently joined the City as a Senior Maintenance worker. Prior to coming to the City he was a Field Supervisor working with Aclara/Hubbel on the DC Water Project. He has worked as a water operator for Ch2M and a water meter tech for Vanguard and Keystone Utility Systems.

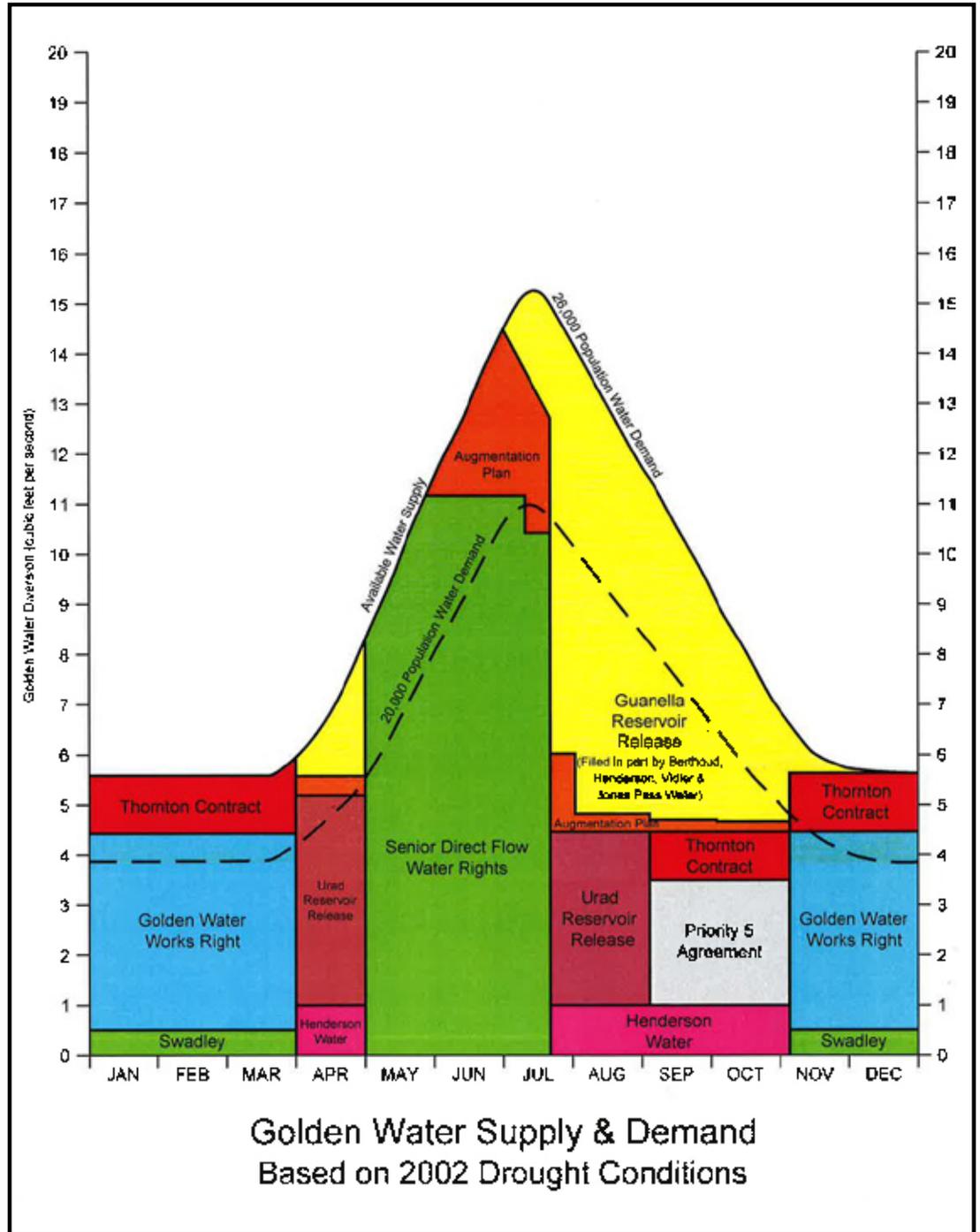
RUBEN BARRAGAN has been working for the City of Golden for a year and has a Class B CDL license. Previously Ruben worked for three years in the water meter department for another city. He has a wife and a daughter. When not at work he enjoys skateboarding, hiking, soccer and can finish a Rubik's cube in under a minute.

Water Rights - Mosaic

The graphic shown to the right demonstrates how Golden manages its water rights to fulfill municipal demand. The various colors (and descriptions) represent different sources of water, which are available only under specific circumstances. The larger green shaded area represents spring and early summer run-off, (snow melting), when our "Senior Direct Flow Water Rights" are in priority. This water is naturally tributary to the South Platte Basin. Being "In Priority" means there is enough natural flow in Clear Creek to satisfy a water right.

The large yellow shaded area represents water that has been stored in our reservoirs, which can be released as needed, when the snow has melted. We release this stored water whenever there is not enough natural flow to satisfy our municipal needs. This released water will be replaced the following spring during the "Run-off Season".

As river conditions change throughout the year, we may use any combination of Water Rights that are in priority, hence our Supply and Demand chart can look like a jigsaw puzzle.



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 few years have been brutal.

To understand the extent of that variability, just compare the April 11, 2017 snowpack of about 17 inches SWE (Snow Water Equivalent) to April 11, 2018 snowpack of about 11 inches. A more graphical representation of the variable snowpack plus a look at where we are this year is presented in the graph (in the graph on this page).

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 2907 Acre Feet of water (one Acre Foot = 325,851 gallons).

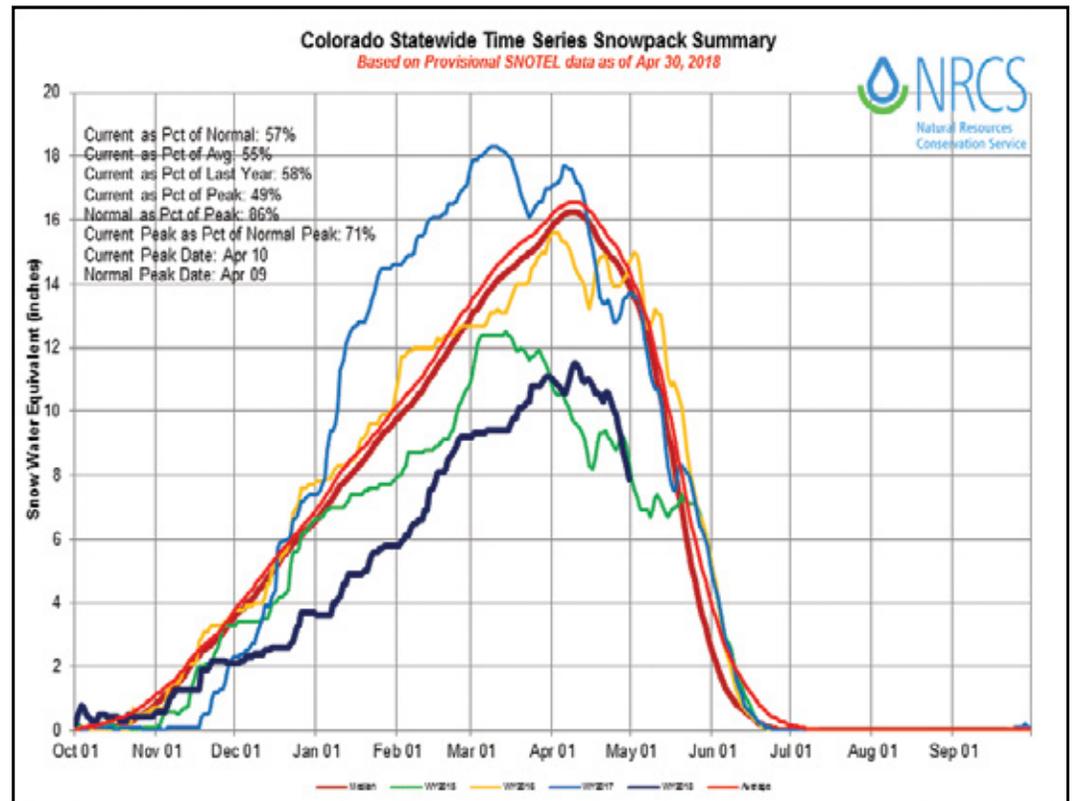
We fill our reservoirs during the winter and spring so that we have water available in late summer and fall after the runoff from snowmelt has ended.

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 have subsequently been able to refill our reservoirs over the winter so that each 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 citywide culture of wise and efficient use of this most precious renewable resource.



(WY= Water Year which is from Nov. 1 to Oct. 31)



Are You Polluting Golden's Creeks?

IF YOU DON'T PICK UP AFTER YOUR PET, YOU ARE.

All untreated water poses potential health risks. In its natural state, Clear Creek contains pathogenic organisms from birds and mammals that live in and near the water. As Clear Creek flows through urbanized areas of the watershed, domestic animals become the primary source.

Dog waste can be a significant source of pathogens such as bacteria, viruses, and parasites, in addition to excess nutrients. It is estimated that the average size dog produces 3 billion fecal coliform bacteria - in each dog doo - along with Salmonella and Giardia. This is bad news for water quality.

When dog waste is not properly disposed, pathogenic organisms are washed into waterways with runoff from stormwater and landscape irrigation. This impacts recreational use, drinking water treatment and the overall health of our watershed.

While we can't control the contributions of wild animal populations, we can control the contribution from our own pets by picking up after them. The best way to improve water quality is to prevent contamination from occurring in the first place.

It's not just unsightly; it's unhealthy. Please pick up after your pet.



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/DrinkingWater

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 2017 de City of Golden, visite www.cityofgolden.net/CalidaddeAgua.

