



City of Golden



Evaluating Drinking Water Lead Levels: Public Drinking Fountains and Municipal Facilities

September 2016

Reasons Behind Sampling

The City of Golden is committed to the health and wellbeing of families and members of our community and works to limit exposure to lead in drinking water. National, state and local discussions around lead contamination of water supplies has prompted the City to consider current and past monitoring of lead and evaluate opportunities for additional lead sampling that could provide beneficial data for the community. Lead contamination in water is directly linked to the type of plumbing and fixtures used in specific locations, so the only way to know the lead levels for a specific facility is to test the water at that facility. Under the current EPA Lead and Copper Rule (LCR), previous monitoring by the City focused on sample sites that fit the criteria parsed out in the rule. This resulted in the bulk of monitoring to occur at single family residences. The City of Golden in June 2016 decided to perform proactive lead sampling at 16 public drinking fountains provided throughout the city as well as at 6 municipal facilities that are open to the public and/or volunteers.

Sample collection was performed by City of Golden Environmental Services staff between July and September, 2016. All samples were sent to a third party lab, certified by the State to perform lead analysis. The results of each public fountain and municipal facility were below the LCR action level of 15 parts per billion for lead. The following report will discuss how lead gets into drinking water and the City's past history of lead compliance samples, the methodology used to conduct the sampling, locations and analytical results of each fountain and municipal facility sampling points, and conclusions/recommendations based on the data.

Lead Pathways into Drinking Water

Lead is a common metal found in the environment, but lead in drinking water does not come from source water, the water treatment plant or the water main. In drinking water, lead comes from plumbing pipes and fixtures composed of lead as they come into contact with corrosive waters. Potential sources of lead in plumbing are lead pipes, lead solder on copper piping, or brass or chrome-plated brass faucets and fixtures with lead solder. Homes and buildings built before or during the 1950s may have lead service lines. Newer homes or buildings – those built prior to 1987 – may have lead solder in the joints of copper pipe. The City of Golden does not own service lines. The service line, from the water main to the home or building is owned by the property owner and has the potential to be composed of lead. This resource from NPR (<https://apps.npr.org/find-lead-pipes-in-your-home/en/#intro>) might help you identify your pipes or you can have a certified plumber come verify your plumbing.

Dissolving or wearing away of metal results from a chemical reaction between water and plumbing materials if the water does not have the correct chemical balance. This reaction or *corrosion* occurs when water is at too low of a pH (acidic) or when water does not contain enough dissolved solids (low mineral content). The City of Golden has an approved 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.

Since the main source of lead in drinking water comes from lead service lines, plumbing and plumbing fixtures, the Lead and Copper Rule is a treatment technique rule that sets an “Action Level (AL)” rather than a “Maximum Contaminant Level (MCL)”. An MCL is based on health effects of contaminant levels whereas an AL is a water treatment evaluation tool. If there is an exceedance of the 15 parts per billion lead action level in more than 10 percent of the samples tested, it automatically triggers changes in how the plant treats water. This may include additional treatment for corrosion control or even replacing some water mains.

Lead and copper samples for LCR monitoring compliance are taken at the plant and out in the community at several designated sampling sites. To select these sites, the City targets homes that are likely to have or have lead plumbing materials. The City of Golden was placed on a three-year sampling schedule for the LCR because of the City’s long term historical data showing no evidence of corrosivity. Since the Lead and Copper monitoring rule went into effect in 1991, the City has not had a single exceedance or violation for lead. Water treated here has been carefully balanced before entering the system. For more information about the City of Golden LCR compliance sampling and data please contact the Environmental Services division at esdiv@cityofgolden.net or call the water quality lab at (303) 384-8181.

Populations most at risk regarding lead exposure are young children, infants and fetuses (pregnant women). The health effects and hazards of lead occur at lower exposure levels in children than they would for adults. The sampling of drinking fountains made available at most parks and popular sites throughout the city as well as municipal facilities, like the Golden Community Center and Splash Aquatic Park, captures any potential lead exposure that would affect children, who are more likely to be in these areas. Other pathways of lead exposure to children include paint, dust, soil and air. If your child does experience blood lead levels higher than the CDC action level of 5 micrograms per deciliter, it is important to determine where the lead exposure is coming from.

Sampling Methodology

To conduct all fountain and facility lead sampling, the City of Golden Environmental Services Division followed the guidance document prepared by the Colorado Department of Public Health and Environment, “How to Collect Lead and/or Copper Drinking Water Samples”, released in April 2016 (<https://www.colorado.gov/cdphe/lcr>). This method requires samples to be taken in a one-liter sampling bottle from a tap that has not been used for a minimum of six hours. The method also requires samples be taken from cold water faucets at a flow a consumer would use to fill a glass of water or a water bottle. All samples collected were sent to Colorado Analytical, a Colorado

Certified Safe Drinking Water Laboratory that can run the EPA 200.8 Method for the Determination of Trace Elements.

The stagnation period for lead sampling is important and a major factor influencing potential lead levels in drinking water. When standing water is in contact with lead plumbing materials, the most metal leaching can occur. In order to make sure that the drinking fountains sampled were unused for six hours, the fountains were bagged and taped with signs indicating the fountain was temporarily out of service. Both the time the fountain was bagged and the time the sample was taken were recorded to verify the stagnation period. For the sampling of municipal facilities, the times of last water use were recorded the night before and samples were taken in the morning before regular water use commenced.

It is important to mention that with certain municipal facilities the six-hour stagnation time was unable to be achieved before sampling. The City Hall Police Department has staff on site 24/7 with no break in water use at this building. In addition, the Clear Creek RV Park does experience a small break in water use during the night, but it is not longer than six hours. Use of water in the RV park is also difficult to control. Environmental Services determined it was beneficial to take samples at these locations even though they did not meet the six-hour stagnation time requirement of the CDPHE sample collection method because a stagnation period for these locations were not the typical use patterns.

The physical layout and nature of some fountains along with the shapes of the sampling bottles made it impossible to fill some of the sample bottles to the 1000 mL fill line. All samples that were below the 1000 mL fill line are clearly marked below in “Table 1- City of Golden Drinking Water Fountain and Facility Lead Results” with an asterisk. Environmental Services determined it was beneficial to have these samples analyzed even though the volume did not meet the sampling method criteria. Analysis of these samples still provides data on any potential lead contamination coming from the fountain fixtures.

All samples were taken from cold water fountains and faucets with flows that mimic how a typical consumer would take a drink or fill a glass of water. Any fountains that had point of use treatment devices that filter out inorganic contaminants were left out of the sampling. The fountain at Parfet Park was unable to be sampled because the fixture was broken and out of use during the monitoring period. The entire fountain fixture has since been replaced. Newer fixtures manufactured after the implementation of the 2011 Reduction of Lead in Drinking Water Act have 0.25% allowable lead content and therefore pose a smaller risk of leaching lead. The two fountains sampled at the Tony Gramscas Memorial Complex are supplied with water from the North Table Mountain Water and Sanitation District and are not part of the City of Golden water distribution system.

Table 1- City of Golden Drinking Water Fountain and Facility Lead Results

Sample Date	Sample Name	Analyte	Result	Units
6/28/2016	Norman D Park Fountain	Lead	0.9	ppb
6/28/2016	New Loveland Mine Park Fountain*	Lead	1.3	ppb
6/28/2016	Discovery Park Fountain	Lead	0.2	ppb
6/28/2016	Southridge Park Fountain	Lead	1.2	ppb
6/28/2016	Lion's Park Ballfields Fountain*	Lead	0.2	ppb
7/1/2016	White Ash Mine Park Fountain	Lead	0.8	ppb
7/1/2016	Lion's Park Gazebo Fountain*	Lead	0.8	ppb
7/1/2016	Lion's Park Playground Fountain*	Lead	0.4	ppb
7/1/2016	Downtown - Streetscape Fountain*	Lead	0.4	ppb
7/1/2016	Beverly Heights Park Fountain	Lead	0.5	ppb
7/1/2016	Golden Heights Park Fountain*	Lead	1.8	ppb
7/1/2016	Tony Grampsas Memorial Complex - Grampsas Memorial Fountain*	Lead	9.2	ppb
7/1/2016	Tony Grampsas Memorial Complex - Ballfields Fountain*	Lead	5.8	ppb
7/1/2016	Heritage Dells Park Fountain	Lead	3.1	ppb
7/1/2016	Ulysses Park Fountain	Lead	0.1	ppb
9/16/2016	Splash Aquatic Park Fountain	Lead	<0.1	ppb
7/28/2016	Golden Community Center	Lead	<0.1	ppb
7/28/2016	Golden History Center	Lead	0.3	ppb
7/28/2016	Visitor's Center Fountain*	Lead	0.3	ppb
7/29/2016	Clear Creek RV Park	Lead	0.1	ppb
8/10/2016	Fossil Trace Clubhouse	Lead	<0.1	ppb
8/12/2016	City Hall	Lead	<0.1	ppb

Range = <0.1-9.2 ppb

< 0.1 ppb = Below lowest level of 0.1 ppb that can be reported

ppb = parts per billion

* = sample not filled to 1000 mL line (see discussion in sampling methodology)

Lead action level = 15 ppb

Conclusions

All of the 22 samples taken from public fountains and municipal facilities were below the EPA lead action level of 15 parts per billion. Of those 22 samples, 16 were below 1 part per billion. The two highest samples were taken from fountains at the Tony Grampas Memorial Complex. The water supplied to these fountains is from the North Table Mountain Water and Sanitation District, but the fixtures are owned by the City of Golden. The fountain located near the Grampas Memorial had a lead concentration of 9.2 ppb and the fountain located next to the ballfields had a lead concentration of 5.8 ppb. Even though these samples are below the EPA action limit, they are higher than the majority of the results. Considering this, the Environmental Services Division recommends the two fountain fixtures at the Tony Grampas Memorial Complex be replaced.

The variability of lead in drinking water is directly linked to the types of plumbing pipes and fixtures the water passes through. Even though we take great care in treating Golden's water, if you have a lead service line or lead materials in your home plumbing or fixtures there will always be a risk of lead being in your drinking water. Since children can experience health effects from lead at low exposure levels, there has been a consensus between public health experts that there is no safe level of lead. You can take steps to identify and remove lead materials within your home plumbing to reduce your family's risk.

Without making plumbing changes, you can reduce potential lead contamination in your drinking water. The longer water sits in pipes that are made of lead or have lead solder, the higher the lead levels may be. If the water at a faucet hasn't been used for several hours, flushing the cold water for a couple minutes, or until the water reaches a consistent temperature will remove the water that has had the longest contact with any lead materials. In addition, only use cold water for drinking or when cooking; hot water can cause a greater amount of lead to release from plumbing. Always only use cold tap water, including water used for making ice, beverages and infant formula. Removing and cleaning faucet aerators every month will also help get rid of particles that can collect in the aerator screen. It is good practice to replace aerators every year. You may also utilize in home water filters or treatment devices that have been approved to filter out lead.

Future Steps

Jefferson County Public Schools performed lead sampling at all the public school facilities in the county this past summer. The results of this sampling effort have shown a number of schools with sinks or fountains with lead levels above the EPA action level of 15 ppb. Private charter schools, preschools and daycares were not included in the sampling as they are in charge of their own facilities. To further the sampling effort by JPS and as part of Golden's commitment to providing high quality, safe drinking water for all children in the community, the City of Golden Environmental Services staff have begun to reach out to the charter schools and daycares in the area to coordinate lead sampling for these facilities.