175 East 200 North
St. George, UT 84770

Presenting:
Your 2011 Drinking Water Quality Report

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2011 Drinking Water Quality Report
City of St. George

Spanish (Espanol)

Este informe contiene informacion muy importante sobre la calidad de su agua potable. Por favor lea este informe o communiqués con alguien que pueda traducir la informacion.

We are once again pleased to present to you our annual water quality report. This edition covers all testing completed from January 1 through December 31, 2011. Over the years, we have dedicated ourselves to producing drinking water that meets all state and federal drinking water standards. We continually strive to adopt new and better methods for delivering the best quality drinking water to you. As new challenges to drinking water safety emerge, we remain vigilant in meeting the challenges of source water protection, water conservation and community education while continuing to serve the needs of all our water users. Please share your thoughts with us about the information in this report, as well-informed customers are our best allies.

How can I learn more? If you want to learn more about this report, or have questions relating to your drinking water provided by St. George, please call Barry Barnum, Water Services Director, or Shari McTiver, Water Services Engineer at (435) 627-4800.

If you want to get involved in water resources, you can attend any of the regularly scheduled meetings of the Washington County Water Conservancy District. Meetings are scheduled monthly at 7 PM at their office building located at 533 East Waterworks Drive (just off East Red Hills Parkway) in St. George. The schedule is available at http://wcwcd.state.ut.us/Board.htm or you can call (435) 673-3617.

Where does my water come from? Our water sources are from both groundwater and surface water sources. Our multiple spring and groundwater sources draw from consolidated rock aquifers of the Navajo Sandstone and Kayenta Formation, which lie within the Virgin River basin. We purchase our surface water from the Washington County Water Conservancy District. Their surface water is drawn from the Virgin River, stored at Quail Lake and Sand Hollow Reservoirs and treated at the Quail Creek Water Treatment Plant before transmission to our City boundaries and distribution to our customers. With some exceptions, all water customers within the City receive a mixture of water from groundwater and surface water sources during some times of the year. Customers located along State Highway 18 as far north as the Ledges Subdivision are served exclusively by groundwater from our Tolman-Ledges wells.

Water Conservation Tip - Repair a dripping faucet and you can save 15 to 20 gallons per day or 6,000 gallons of water each year.

Water Conservation Tip - Use your water meter to detect hidden leaks. Check the meter reading, then turn off all water taps and water using appliances. Check the meter again after 15 minutes and if the reading changed, you have a leak that needs to be repaired.

Source Protection: Drinking Water Source Protection Plans (DWSPPs) for the City of St. George are available for your review. They contain information about source protection zones, potential contamination sources and management strategies to protect drinking water that originates from City-owned groundwater wells. Most of our groundwater sources are located in remote and protected areas and have a low level of susceptibility to potential contamination sources. We have also developed management strategies to further protect our sources from contamination. Our plans are available for review on the City's web site at www.sgcity.org/waterservices or at the St. George Water Department office located at 811 East Red Hills Parkway during normal business hours. Please contact us if you have questions or concerns about our source protection plan.

The Washington County Water Conservancy District (WCWCD) maintains the Watershed Protection Plans for the portion of the Virgin River basin from which they draw, store and treat surface water. Additional information on their source protection plans can be obtained by calling (435) 673-3617.

Water Conservation Tip - Check toilets for leaks by putting a few drops of food coloring in the rear tank. Check the bowl for a few minutes to see if the color appears. If it does, you can easily repair the leak and save about 30,000 gallons of water per year.

Water Hardness: Most of the water sources in Southern Utah are said to be "hard" and that's because they contain high amounts of nontoxic calcium or magnesium minerals. Hard water does not dissolve soap readily, so making lather for washing and cleaning is difficult.

Many customers use treatment devices, such as water softeners, to remove the calcium and magnesium from tap water to produce soft water for household use. Customers with water softeners will find that settings between ***13 to 22 grains per gallon*** will provide the most effective treatment.

Water Quality Test Results:
The City of St. George routinely monitors for constituents in our drinking water in accordance with the Federal and Utah State laws. Some contaminants are sampled less frequently because they do not change frequently. Unless otherwise noted, the following table lists all of the drinking water contaminants that we detected in our water through analytical monitoring during the 2011 calendar year. You may find terms and abbreviations in table below that you may not be familiar with, and we've provided definitions on the facing page.

CITY OF ST. GEORGE – 2011 WATER QUALITY DATA
Table of Test Results

Contaminant	Violation Y/N	City Groundwater & WCWCD Surface Sources		Tolman – Ledges Area Groundwater Source		Unit of Measure	MCLG	MCL	Likely Source of Contamination
		Level Detected ND/Low-High	Last Sample Date	Level Detected ND/Value	Last Sample Date				
Microbiological Contaminants									
Total Coliform Bacteria	N	ND	2011	ND	2011	N/A	0	Presence of coliform bacteria in 5% of monthly samples	Naturally present in the environment
Fecal Coliform & E. Coli	N	ND	2011	ND	2011	N/A	0	If a routine sample and repeat sample are total coliform positive, and one is also fecal coliform or *E. coli* positive	Human and animal fecal waste
Turbidity, Ground Water	N	0 – 0.3	2011	0.3	2011	NTU	N/A	5	Soil runoff
Disinfectants & Disinfection Byproducts - There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.									
Chlorine (as Cl_2)	N	110 – 1,140	2011	220 - 570	2011	µg/L	4,000	4,000	Water additive used to control microbes
Total Haloacetic Acids [HAA5]	N	ND - 21	2011	NS	2011	µg/L	0	60	Byproduct of drinking water disinfection
Total Trihalomethanes [TTHM]	N	1-68	2011	NS	2011	µg/L	0	80	Byproduct of drinking water disinfection
Inorganic Contaminants									
Alkalinity, Total	N	160	2011	NS		mg/L		TT	Naturally occurring soluble mineral salts
Arsenic	Y	ND – 11	2011	5	12/7/2011	µg/L	0	10	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes
Barium	N	ND - 320	2011	ND	12/7/2011	µg/L	2,000	2,000	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Carbon, Total Organic	N	ND - 718	2011	ND	12/7/2011	mg/L	NA	TT	Naturally present in the environment
Copper a. 90% results b. # of sites exceeding the AL	N	a. 76 b. 0	9/18/2009	ND	4/28/2008	µg/L	1,300	AL=1,300	Corrosion of household plumbing systems; erosion of natural deposits
Fluoride	N	ND - 700	2011	1,400	12/7/2011	µg/L	4,000	4,000	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
Lead c. 90% results d. # of sites exceeding the AL	N	a. ND b. 0	9/18/2009	ND	4/28/2008	µg/L	0	AL=15	Corrosion of household plumbing systems, erosion of natural deposits
Nitrate (as Nitrogen)	N	100 – 2,600	2011	500	12/7/2011	µg/L	10,000	10,000	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Selenium, Total	N	ND - 11	2011	ND	12/7/2011	µg/L	50	50	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines
Sodium, Total	NA	ND - 58	2011	120	12/7/2011	mg/L	None set by EPA	None set by EPA	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills.
Sulfate	N	ND - 290	2011	320	12/7/2011	mg/L	1,000*	1,000*	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills, runoff from cropland
Total Dissolved Solids	N	93 - 660	2011	920	12/7/2011	mg/L	2,000**	2,000**	Erosion of natural deposits

*If the sulfate level of a public water system is greater than 500 ppm, the supplier must satisfactorily demonstrate that: a) no better water is available, and b) the water shall not be available for human consumption from commercial establishments. In no case shall water having a level above 1000 ppm be used.

**If TDS is greater than 1000 ppm the supplier shall demonstrate to the Utah Drinking Water Board that no better water is available. The Board shall not allow the use of an inferior source of water if a better source is available.

CITY OF ST. GEORGE – 2011 WATER QUALITY DATA Table of Test Results									
		City Groundwater & WCWCD Surface Sources		Tolman – Ledges Area Groundwater Source					
Contaminant	Violation Y/N	Level Detected ND/Low-High	Last Sample Date	Level Detected ND/Value	Last Sample Date	Unit of Measure	MCLG	MCL	Likely Source of Contamination
Radioactive Contaminants *(continued)*									
Gross Alpha	N	1 - 6	2011	2	12/7/2011	pCi/L	0	15	Erosion of natural deposits
Gross Beta	N	ND – 12	2011	14	12/7/2011	pCi/L	0	4 mRem/yr	Decay of natural & man-made deposits
Radium 226	N	ND - 1	2011	0.5	12/7/2011	pCi/L	0	5	Erosion of natural deposits
Radium 228	N	ND – 1	2011	0.5	12/7/2011	pCi/L	0	5	Erosion of natural deposits
Radon 222	NA	ND - 249	2011	6.5	NA	pCi/L	None set by EPA***	None set by EPA***	Naturally occuring gas in groundwater

***Radon was detected in groundwater supplies in 2 out of 3 sources tested since testing began. There are no State or federal regulations for radon levels in drinking water. However, due to these results, ongoing radon monitoring will be conducted for all spring and groundwater sources.

Unit Descriptions	
Units of Measure	Definition
ng/L	Micrograms per Liter – The number of nanograms of a substance in one liter of water. Also known as one part per trillion (ppt) 100,000 nanograms (ng) = 1000 micrograms (µg) = 1 milligram (mg), and 1000 milligrams (mg) = 1 gram (g)
µg/L	Micrograms per Liter – The number of micrograms of a substance in one liter of water. Also known as one part per billion (ppb) 1000 micrograms (µg) = 1 milligram (mg), and 1000 milligrams (mg) = 1 gram (g)
mg/L	Milligrams per Liter – The number of milligrams of a substance in one liter of water. Also known as one part per million (ppm)
ppb	Parts per Billion - The number of parts of a substance in one billion parts of water. Also known as micrograms per liter (µg/L). One part per billion corresponds to one minute in 2,000 years, or a single penny in $10,000,000.
pCi/L	Picocuries per Liter – A measure of the radioactivity in a liter of water.
NTU	Nephelometric Turbidity Units - Turbidity is a measure of the cloudiness of the water. Turbidity is monitored it because it is a good indicator of the effectiveness of the filtration system at the Quail Creek Water Treatment Plant. Turbidity in excess of 5 NTU is just noticeable to the average person.
positive samples	The number of positive samples taken this year.
% positive samples/month	The percentage of samples taken monthly that were positive.
NA	Not Applicable
ND	Not Detected – The contaminant was not detected in the water sample during laboratory analysis.
ND or Low - High	For water systems like St. George with multiple water sources, the Utah Division of Drinking Water allows the option of listing the test results of the constituents in one table, instead of multiple tables. To accomplish this, the lowest and highest values detected in the multiple sources are recorded in the same space in the report table. As noted above, most customers receive a mixture of water from the City's groundwater wells and surface water purchased from the WCWCD that is treated at QCWTP. The ranges for these these analytical values are shown in the columns indicated.
NR	Not Required – Monitoring not required, but recommended.
W	Waiver - Because some chemicals are not used or stored in areas around drinking water sources, some water systems have been given waivers that exempt them from having to take certain chemical samples these waivers are also tied to Drinking Water Source Protection Plans.

Definitions of Important Drinking Water Terms & Acronyms	
AL	Action Level - The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
Last Sample Date	Date - Because of required sampling time frames i.e. yearly, 3 years, 6 years and 9 years, sampling dates may seem out-dated.
MCLG	Maximum Contaminant Level Goal - The "Goal" (MCLG) is 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.
MCL	Maximum Contaminant Level (MCL) - The "Maximum Allowed" (MCL) is 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.
TT	Treatment Technique - A treatment technique is a required process intended to reduce the level of a contaminant in drinking water.
AL	Action Level - The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
Variances & Exceptions	Variances or Exceptions - State or EPA permission not to meet an MCL or a treatment technique under certain conditions.
MRDLG	Maximum Residual Disinfectant Level Goal - 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.
MRDL	Maximum Residual Disinfectant Level - 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.
MNR	Monitored Not Regulated
MPL	Maximum Permissible Level – State assigned

Substances That Could Be in Water: To ensure that tap water is safe to drink, EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. 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 the water poses a health risk. The EPA has determined that your water IS SAFE at these levels. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at 1-800-426-4791.

Sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or though the ground, it can dissolve naturally occurring materials, and can pick up a wide variety of substances:

- *Microbial Contaminants*, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, or wildlife,
- *Inorganic Contaminants*, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial, or domestic wastewater discharges, oil and gas production, mining or farming,
- *Pesticides and Herbicides*, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses,
- *Organic Chemical Contaminants*, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and which may can also come from urban stormwater runoff, gas stations and septic systems,
- *Radioactive Contaminants*, which can be naturally occurring or may be the result of oil and gas production and mining activities.

More information about contaminants and potential health effects can be obtained by calling the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791, or their web site at www.epa.gov/safewater.

Water Conservation Tip – Irrigate during the evening, night or early morning hours to reduce water lost to evaporation.

Arsenic: Effective in 2006, the EPA established a maximum contaminant level (MCL) of 10 parts per billion (ppb) for arsenic in drinking water. The City of St. George has some wells with naturally occurring arsenic concentrations that exceed the MCL. The City is working cooperatively with the Utah Division of Drinking Water under a Bilateral Compliance Agreement to meet this standard with a combination of restricting high arsenic sources and blending treatment. Blending involves mixing water containing lower arsenic levels with unrestricted wells so that the blended water meets the new arsenic standard. Treatment proposals were approved by the State & detailed performance tests were concluded in 2011 for the Gunlock and Snow Canyon sources. The City was able to demonstrate that our blending treatment process can achieve blended flows that meet the arsenic MCL from these sources.

Some people who drink water containing arsenic that is in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer. It is important to note that EPA's arsenic MCL balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of chronic exposure to low levels of arsenic.

Point-of-use treatment devices, such as reverse osmosis and distillation units can be effective in removing arsenic. However, their effectiveness varies, they can be expensive, and they must be properly maintained. If a treatment device is installed, set up an effective and practical maintenance and monitoring program to be sure the system is maintained as recommended by the manufacturer. This is the best way to be certain that your device is doing the job intended.

Water Conservation Tip - Check toilets for leaks by putting a few drops of food coloring in the rear tank. Check the bowl for a few minutes to see if the color appears. If it does, you can easily repair the leak and save about 30,000 gallons of water per year.

Health Info on Microbiological Contaminants & Lead: Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by microbiological contaminants are available from the EPA's Safe Drinking Water Hotline (800-426-4791).

Customers are advised to exercise caution with whole-house systems that remove the chlorine used by our water utility for water disinfection. Without a disinfectant in your home piping, you could unknowingly allow microbial contaminants to grow in your home piping. These microbial contaminants can break away from your home piping & exit as you draw tap water. They may cause illnesses, especially for immuno-compromised family members.

FAQ: Growths in bathrooms or pet bowls that are ***pink*** or ***black*** in color come from various types of mold in the air – not your tap water. Wash those surfaces frequently and keep fresh water in pet bowls.

Lead: If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. We are responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. All customers can minimize their potential for exposure to lead by flushing taps for 30 seconds to 2 minutes before using the water for drinking or cooking. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available at www.epa.gov/safewater/lead.

The age of your home is an indicator of what type of plumbing materials you may have. Homes built through the early 1900s commonly used lead pipes for plumbing. Until the 1940s, lead piping was often used for the service lines that join homes to the street water mains. In the 1930s, copper or galvanized piping replaced lead piping in many homes. Until the mid-1980s, copper piping was installed with solder and fluxes containing lead. If your home fits any of these categories, your plumbing may contain lead that can leach into your drinking water, especially when it has not been used for several hours.

Free Lead & Copper Testing: The City conducts lead and copper testing every 3 years at 30 homes, and we are scheduled to conduct the testing this summer. Older homes with lead, galvanized steel or copper plumbing components receive higher priority selection for this testing program. If you would like to be placed in a pool of homes eligible for free lead & copper testing, please contact Shari McTiver at (435) 627-4858.

Cross-connections: Cross-connections to drinking water system lines are a major concern. A cross-connection is formed at any point where a drinking water line connects to equipment, systems containing chemicals, or water sources of questionable quality. Examples are boilers, air conditioning systems, fire sprinkler systems, irrigation systems, etc. Whenever equipment pressure rises above the pressure in the drinking water system line, contamination can occur. Backpressure from the equipment allows contamination to pass into the drinking water line. Contamination by backsiphonage occurs when the pressure in the drinking water line drops below that in the equipment. This can happen under normal operating scenarios when demand is heavy, or when a main breaks. Backsiphonage draws contaminants out of the equipment & into the drinking water line.

Customers can help protect water supplies from cross-connections by watching for potential cross-connections and installing & maintaining proper backflow prevention devices. Exterior water taps tend to be the most common sources of cross-connection contamination. All exterior taps should be equipped with ***hose bib vacuum breakers*** to provide backsiphonage protection. Garden hoses attached to chemical sprayers, submerged in a swimming pool, etc., can allow contaminants to be backsiphoned into the City's distribution system. Commercial operators should ensure that chemical tanks are fitted with **air gap assemblies**.

USEPA's Cross-Connection Control Manual is a great source of more info (www.epa.gov/safewater/crossconnection.html). You can also call Marie Kesler, Backflow Protection Administrator at (435) 627-4800.