WATER

Consumer Confidence
Water Quality Report
2017

Private Well Tip:

As a private well owner, should I have my well tested?

Yes, as a private well owner, you are responsible for testing your well to ensure that your well water is safe to drink. The United States Environmental Protection Agency (EPA) is responsible for making sure that the public water supply within the United States is safe. However, the EPA does not monitor or treat private well drinking water.

From aquifer to tap…

The City of Fairfax Water Department is pleased to present the 2017 Annual Water Quality Report. The City of Fairfax has a quality water source that meets all the state and federal EPA primary standards for public health. This last year we have completed upgrading all three of the city's deep wells to stay ahead of the future demand as our city grows. At the end of January 2018 the city started adding a blend of orthophosphate and polyphosphate to help protect against lead and copper corrosion in all of our customers homes and businesses.

Important Questions

What to expect from your drinking water? 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. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (1-800-426-4791).

What are sources of contamination to drinking water? The 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 through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presences of animal or human activity.

Contaminants that may be present in source water include:

(A) **Microbial contaminates**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife;

(B) **Inorganic contaminants**, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

(C) **Pesticides and herbicides**, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses;

(D) **Organic chemical contaminants**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems; and

(E) **Radioactive contaminants**, which can be naturally-occurring or be the result of oil and gas production and mining activities.

Who needs to take special precautions? 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 persons and infants can be particularly at risk from infection. 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 *Cryptosporidium* and microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Lead in plumbing fixtures:

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. FAIRFAX WATER SUPPLY is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

Water System Backup Measures: In the event of unexpected problems the city has a few backup systems built into our utility to ensure our customers have a constant flow of drinking water. With the current three wells if any one of the three is off line the other two will be able to keep up with the current demand. We have increased the production of water at all three of our wells and water plant to help avoid water conservation measures. The water plant at the tower has a backup generator to supply power to well #3 in the event of a power outage. Wells #1 and #2 have had a backup generator installed this summer. The City of Fairfax has 200,000 gallons of water stored in an elevated tank during normal operations. An additional future elevated water tower is being planned and should be completed in about three years. A water study by the city's engineers is currently being conducted.

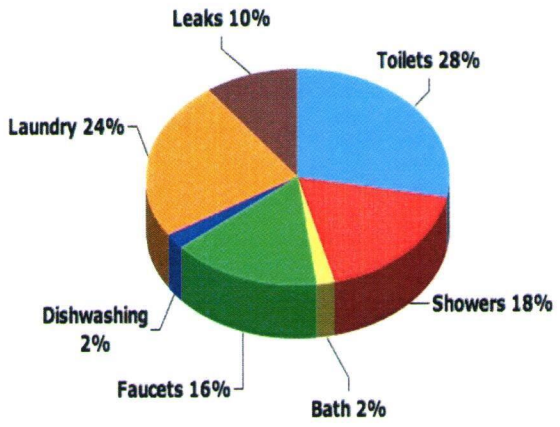
ABOUT OUR WATER...

What's in Fairfax's drinking water? The EPA requires regular sampling of the city's water supply to ensure drinking water safety. In 2017 we ran over 1,800 tests for different substances. The good news is that none of the contaminants that we detected exceeded EPA established Maximum Contaminant Levels or resulted in a violation of drinking water standards. Only a very small percentage of the contaminants tested for exist in our water at detectable levels. The tables on the back pages identify the contaminants that were detected. The Iowa DNR requires us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of the data, though accurate, is more than one year old.

What is the source of Fairfax's drinking water? The City of Fairfax obtains 100% of its water from three wells from the dolomite of the Silurian aquifer that was created long ago by glacial activity. The Silurian aquifer was determined to be susceptible to contamination because of the characteristics of the aquifer. Overlying materials provide some protection from contaminants from the land surface. The Silurian wells will be susceptible to surface contaminants such as leaking underground storage tanks, contaminant spills, and excess fertilizer application. Well #1 is at 305 Main St. and was drilled in 1959; it can produce 216,000 gallons in 12 hours. Well #2 is across the street from #1 and was drilled in 1979; it can produce 190,000 gallons in 12 hours. Well #3 is at 910 2nd St. and was drilled in 1999; it produces 252,000 gallons in 12 hours going through eight filters to remove iron. Fairfax produced over 62 million gallons of drinking water in 2017, this is up by 5 million gallons from last year; our community is growing. This is an average of 58 gal/person/day usage. The national average is 60-80 gal/person/day usage. So the customers of Fairfax are doing a great job of conserving our water resource.

A detailed evaluation of your source water was completed by the Iowa Department of Natural Resources and is available from the Water Operator at 319-389-8439.

Figure 1. Indoor Water Use in a Typical Single Family Home



Source: Aquacraft, 1999. Residential End Uses of Water Study (for American Water Works Association Research Foundation)

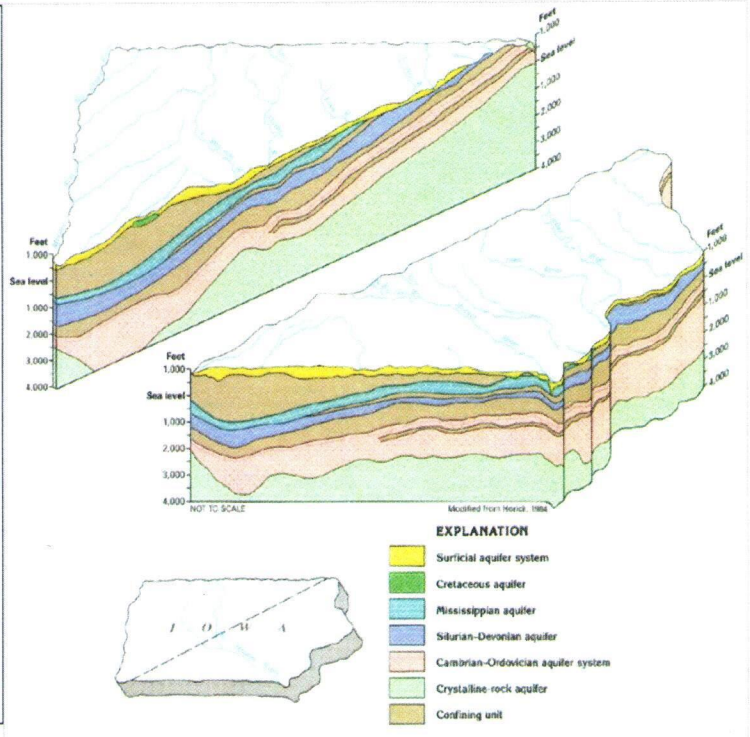
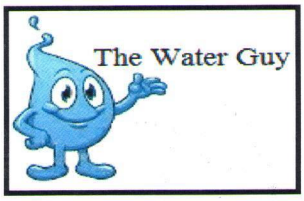


Figure 80. A generalized block diagram shows that the Silurian-Devonian aquifer dips southwestward in Iowa from the area where the aquifer forms the bedrock surface in the northeast to areas where it is deeply buried in the southwest.

WHAT WE ARE DOING…



System Improvements: In January of 2017 the city added two additional iron filtration tanks to the six existing ones. This improvement was done with the new increased horsepower well pump installed in well #3. The water plant can now treat over 500,000 gals/day an increase of 166,000 gals/day. This last year the city also performed maintenance on all wells.

Wells 1 and 2 (drilled in 1959 and 1979) were televised, cleaned and acidized (a process in opening the rock formation below to produce more water). New pumps and drop pipe were installed. The yield before was 135 gpm for each well and now our yield is 300 gpm for well #1 and 275 gpm for well #2. This is a 113 % increase in water production.

Well 3 (drilled in 1999) was televised and cleaned. A new pump and drop pipe were installed to meet the max required flow for the filtration plant. The yield before was 235 gpm and now it is 350 gpm a 49% increase in water production. Fairfax Public Water Supply has increased the available water to its consumers by 75%. This will help with the future water demand for our rapidly growing city.

The City of Fairfax started adding a 70/30 blend of orthophosphate and polyphosphate to the water beginning on January 31, 2018.

The computer system (SCADA) that operates the wastewater plant is now also operating the water system. This gives us control and monitoring of the wells, below ground water levels, chemical usage, pressures in the system, full trending of all the parameters and much more information to help operate the system at its best.

This summer the City will be doing some building maintenance to the well sites and also looking into better securing the well heads.

Hydrant flushing: Twice a year during the spring and fall, you may see Water Department personnel flushing fire hydrants. We do this to remove the accumulation of iron sediment in the pipes, thereby reducing discolored water situations over the long term. Be aware, that hydrant flushing may temporarily cause both a drop in water pressure and discolored water.

A Final Note: At the Iowa Rural Water Association's 2017 Annual Conference in Des Moines the City of Fairfax Public Water Supply and staff was recognized for its commitment to providing the highest quality of service and clean safe drinking water to its customers.

Who do I contact for more information? For more information about drinking water contact the EPA Safe Drinking Water Hotline at 800-426-4791; or contact the Iowa DNR Region 1 Office at (563)-927-2075; or contact The City of Fairfax at (319)-846-2204.

City Council Meetings are held the second Tuesday of every month at 6:00 PM, upstairs at 300 80th Street Court, Fairfax, Iowa.

Frequently Asked Questions:

What is hard water? Fairfax's water contains the naturally occurring mineral calcium, which is better known as hardness. Water was described as "hard" when people found it *hard* to make soap suds or lather from the water. The presence of calcium in the water is not a health concern but rather somewhat of a nuisance that is very costly to remove on a large scale. Some individuals use a water softener to remove unwanted hardness. Calcium buildup can be removed from spigots and coffee pots using vinegar. Fairfax's water hardness is about 384 mg/L or 22.5 grains (Very Hard).

Why do I occasionally see discolored water leaving my tap? Discolored water is usually due to the presence of rust (iron). Rust in drinking water can be caused by corrosion in the pipes that carry the water from the treatment plant to your home or corrosion in your home's plumbing, including the hot water heater. Rust is typically not dangerous in terms of health but it can stain laundry. Do not heat-dry laundry washed in rusty water. Problems with discolored water usually clear themselves within a day.

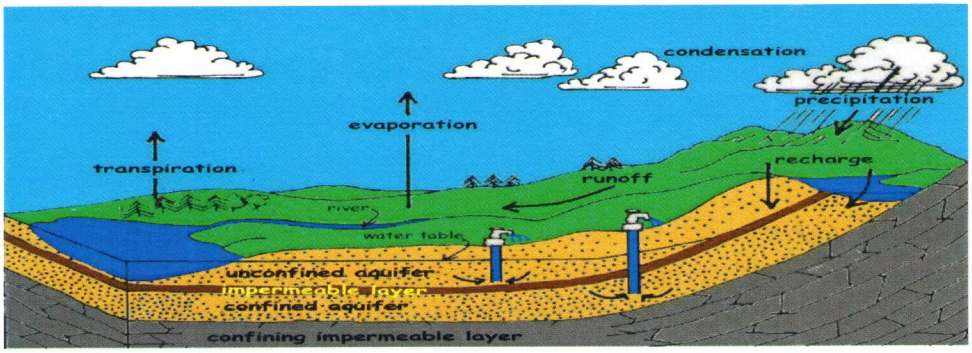
Cloudy water, also known as white water, is caused by air bubbles in the water. It is completely harmless. Water under pressure holds more air than water that is not pressurized. Once the water comes out of your tap, the water is no longer under pressure and the air comes out of solution as bubbles (similar to a carbonated soft drink). The best thing to do is let it sit in an open container until the bubbles naturally disappear. If you have a prolonged discolored water problem, please notify us.

Do water filters remove bacteria? Reverse osmosis filters use normal household water pressure to force water through a semi permeable membrane, which separates contaminants from the water. They're great for removing bacteria and viruses, but they won't remove all chemical pollutants.

What contaminants does Reverse Osmosis remove? Reverse osmosis systems will remove some common chemical contaminants (metal ions, aqueous salts), including sodium, chloride, copper, chromium, and lead; may reduce arsenic, fluoride, radium, sulfate, calcium, magnesium, potassium, nitrate, and phosphorous.

How do I know when my water heater is going to fail? Generally, most water heaters that are **more than 10 years old** should be considered for replacement. If your water heater is in a location that will not cause damage if there is a leak, you can wait until it develops a leak before replacing it, but that really is not recommended. If you discover **rusty water** coming from your water heater and it only comes from the hot side piping in your home, this can be a sign that your water heater is rusting away on the inside and it may begin to leak soon. When you can hear **rumbling or banging sounds** coming from the water heater as it is heating up, this is a sign that the water heater is at the end of its useful life. This is sediment building up on the bottom of the tank. As the sediment is heated and reheated, it eventually will harden. If you notice **moisture around your water heater** you may have a small leak or a fracture in the tank. As the metal heats, it expands and if there are slight fractures, water may leak from the tank. Once the metal has cooled the inner tank will stop leaking.

How does the rainwater or snow melt get into aquifers? Precipitation infiltrates or moves downward through the soil and travels until it finds an opening. Snow could melt on a mountain top, run down the side of the mountain, and find a creek. It then moves downward through the soil and travels until it reaches the surface again in a river or ocean and then it's evaporated into the atmosphere. That is a complete cycle for a water drop.



Why do I need a backflow device? The City of Fairfax requires the use of a backflow preventer device on all lawn irrigation systems. A backflow preventer is a device that prevents water from flowing backward. They are two main types that are used on irrigations systems.

One type is a Pressure Vacuum Breaker: The Pressure Vacuum Breaker (PVB) must be installed so that the bottom of the assembly is 12" higher than the highest sprinkler head or point of use, so is best used when the lawn is level.

Another type is a Reduced Pressure Assembly: The Reduced Pressure Assembly (RPA) can be used when there are elevation changes in the lawn. **Both backflow assemblies must be tested once a year by a licensed certified tester and a copy submitted to the City of Fairfax.**

Phosphates.: What you need to know

The City of Fairfax started adding a 70/30 blend of orthophosphate and polyphosphate to the water beginning on January 31, 2018. The following information is provided to you as is relates to the use of phosphates in drinking water.

What are phosphates? Phosphates are water treatment chemicals used to solve specific water quality problems resulting from inorganic contaminants (iron, manganese, calcium, etc.) in ground water supplies and also to maintain water quality (inhibit corrosion, scale, biofilm, reduce lead and copper levels) in the distribution system. Orthophosphate and polyphosphate are two general types used in water treatment along with many different phosphate compounds that exist for use in the water treatment process. Ortho and polyphosphates work together, stabilizing water quality and minimizing color, scale, deposits, corrosion, and chlorine demand in drinking water systems.

What are the problems that phosphates help to solve? Phosphates are used in municipal water systems to perform three broad functions: inhibit corrosion of water mains/plumbing (iron, steel, galvanized, asbestos/cement, lead, copper), sequester nuisance metals in the water supply (iron, manganese, calcium, magnesium). They can also improve the quality of water in the distribution system by removing scale deposits & tuberculation, discourage microbial film formation/regrowth, and stabilizing free chlorine disinfectant residuals.

How do phosphates work in a water system? Orthophosphate based additives are classified as corrosion inhibitors and as such react with dissolved materials (e.g. Ca, Mg, Zn, etc.) in the water to form a very thin metal-phosphate coating or it reacts with metals on a pipe surface to form a microscopic film on the inner surface of the pipe that is exposed to the treated water.

2017 Water Quality Report

Test Results

CONTAMINANT	MCL - (MCLG)	Compliance		Date	Violation	Source
		Type	Value & (Range)		Yes/No	
Disinfection By-Products						
Total Trihalomethanes (ppb) [TTHM]	80 (N/A)	LRAA	3.00 (3-3)	9/30/2017	No	By-products of drinking water chlorination
Total Haloacetic Acids (ppb) [HAA5]	60 (N/A)	LRAA	8.00 (8-8)	9/30/2017	No	By-products of drinking water disinfection
Inorganic Contaminants						
Lead (ppb)	AL=15 (0)	90th	10.30 (ND-29) 1 sample(s) exceeded AL	2017	No	Corrosion of household plumbing systems; erosion of natural deposits
Copper (ppm)	AL=1.3 (1.3)	90th	1.27 (0.0823-1.6) 1 sample(s) exceeded AL	2017	No	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Residual Disinfectants 950 - Distribution System						
Chlorine (ppm)	MRDL=4.0 (MRDLG=4.0)	RAA	2.5 (1.99-2.87)	4st Quarter 2017	No	Water additive used to control microbes
Water Characteristics 950 - Distribution System						
Iron (ppm)	Secondary MCL 0.3	AA	0.12	2017	No	Rusty color; sediment; metallic taste; reddisg or orange staining
Manganese (ppm)	Secondary MCL 0.05	AA	0.031	2017	No	Black to brown color; black staining; bitter metallic taste
pH	Secondary MCL 6.5-8.5	AA	8	2017	No	LOW pH: Bitter metallic taste; corrosion HIGH pH: Slippery feel; soda taste; deposits
Hardness-mg CaCO3/L	N/A (N/A)	AA	384 22.5 Grains	2017	N/A	Soft: 0-17.1 Slighty Hard: 17.1-60 Mod Hard: 60-120 Hard: 120-180 Very Hard: 180 & over
Phosphate PO4 (ppm)	10	AA	2.3	2017	No	Added for corrosion control and metals sequestering
01 - Finished Water Sample Tap, #1						
Combined Radium (pCi/L)	5 (0)	RAA	4.7	10/6/2016	No	Erosion of natural deposits
Ammonia (ppm)	N/A (N/A)	SGL	5.21	7/19/2017	No	Runoff from fertilizer use;leaching of septic tanks, sewage; erosion of natural deposits.
Nitrate (ppm)	10 (10)	SGL	<1.0	4/25/2017	No	Runoff from fertilizer use;leaching of septic tanks, sewage; erosion of natural deposits.
Organic Chemicals (ppb) Volatile Organic Compounds Synthetic Organic Compounds	0.2 - 700 (ND-700)	SGL	ND	4/7/2016	No	Runoff from industrial sites, herbicides, petroleum sites, insecticides and PVC factories
Fluoride (ppm)	4 (4)	SGL	0.51	2/6/2015	No	Water additive which promotes strong teeth; Erosion of natural deposits; Discharge from fertilizer and aluminum factories
Sodium (ppm)	N/A (N/A)	SGL	60.1	4/24/2017	No	Erosion of natural deposits; Added to water during treatment process

Test Results

CONTAMINANT	MCL - (MCLG)	Compliance		Date	Violation	Source
		Type	Value & (Range)		Yes/No	
02 - Finished Water Sample Tap, #2						
Gross Alpha, inc (pCi/L)	15 (0)	SGL	3.22	2/20/2012	No	Erosion of natural deposits
Combined Radium (pCi/L)	5 (0)	SGL	4	3/9/2015	No	Erosion of natural deposits
Ammonia (ppm)	N/A (N/A)	SGL	5.09	7/19/2017	No	Runoff from fertilizer use;leaching of septic tanks, sewage; erosion of natural deposits.
Nitrate (ppm)	10 (10)	SGL	<1.0	4/25/2017	No	Runoff from fertilizer use; leaching of septic tanks, sewage; erosion of natural deposits.
Organic Chemicals (ppb) Volatile Organic Compounds Synthetic Organic Compounds	0.2 - 700 (ND-700)	SGL	ND	4/7/2016	No	Runoff from industrial sites, herbicides, petroleum sites, insecticides and PVC factories
Fluoride (ppm)	4 (4)	SGL	0.53	3/2/2015	No	Water additive which promotes strong teeth; Erosion of natural deposits; Discharge from fertilizer and aluminum factories
Sodium (ppm)	N/A (N/A)	SGL	58.5	10/6/2016	No	Erosion of natural deposits; Added to water during treatment process
03 - Finished Water Sample Tap, #3						
Combined Radium (pCi/L)	5 (0)	RAA	1.8	10/12/2015	No	Erosion of natural deposits
Ammonia (ppm)	N/A (N/A)	SGL	3.49	7/19/2017	No	Runoff from fertilizer use;leaching of septic tanks, sewage; erosion of natural deposits.
Nitrate (ppm)	10 (10)	SGL	<1.0	7/5/2017	No	Runoff from fertilizer use; leaching of septic tanks, sewage; erosion of natural deposits.
Nitrite (ppm)	1 (1)	RAA	<0.1 (<0.1-<0.1)	10/3/2017	No	Runoff from fertilizer use; leaching of septic tanks, sewage; erosion of natural deposits.
Fluoride (ppm)	4 (4)	RAA	0.69	4/1/2015	No	Water additive which promotes strong teeth; Erosion of natural deposits; Discharge from fertilizer and aluminum factories
Sodium (ppm)	N/A (N/A)	SGL	31.2	10/6/2016	No	Erosion of natural deposits; Added to water during treatment process

Test Results

CONTAMINANT	MCL - (MCLG)	Compliance		Date	Violation	Source
		Type	Value & (Range)		Yes/No	
03 - Finished Water Sample Tap, #3						
Combined Radium (pCi/L)	5 (0)	RAA	1.8	10/12/2015	No	Erosion of natural deposits
Nitrate (ppm)	10 (10)	SGL	<1.0	7/19/2016	No	Runoff from fertilizer use; leaching of septic tanks, sewage; erosion of natural deposits.
Nitrite (ppm)	1 (1)	RAA	<0.1 (<0.1-<0.1)	10/3/2016	No	Runoff from fertilizer use; leaching of septic tanks, sewage; erosion of natural deposits.
Fluoride (ppm)	4 (4)	RAA	0.69	4/1/2015	No	Water additive which promotes strong teeth; Erosion of natural deposits; Discharge from fertilizer and aluminum factories
Sodium (ppm)	N/A (N/A)	SGL	31.2	10/6/2016	No	Erosion of natural deposits; Added to water during treatment process

Note: Contaminants with dates indicate results from the most recent testing done in accordance with regulations.

Definitions:

- 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.
- Secondary Maximum Contaminate Level (SMCL) - They are established as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color, and odor. These contaminants are not considered to present a risk to human health at the SMCL.
- Maximum Contaminant Level Goal (MCLG)— The level of the contaminant in drinking water below which there is no known or expected risk to health. MCLG allow for a margin of safety.
- ppb—parts per billion.
- ppm—parts per million.
- pCi/L—picocuries per liter.
- N/A—Not applicable
- ND—Not detected
- RAA—Running Annual Average
- AA— Annual Average
- LRAA—Locational Running Annual Average
- Treatment Technique (TT)—A required process intended to reduce the level of a contaminant in drinking water.
- Action Level (AL)— The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
- 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.
- 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 contaminates.
- SGL— Single Sample Result
- TCR— Total Coliform Rule