

City of St. Francis Water System Information

Water System

The City of St. Francis gets its water from 3 deep wells; one is finished in the Mt. Simon aquifer and two are finished in a Quaternary Buried Artesian aquifer. The distribution system consists of approximately 35 miles of water main, 344 fire hydrants, 568 gate valves, and approximately 1,500 water service connections. The City's water tower has a storage capacity of 750,000 gallons. An additional 1.2 Million Gallons of storage are available at the recently constructed Water Treatment Plant. Chlorine and fluoride are added to the water for disinfection and dental hygiene. An orthophosphate is added for corrosion control in your interior plumbing.

Water Treatment Plant

The St. Francis Water Treatment Plant went online in late December, 2008, the plant was constructed to treat the water to bring the amount of Radium 226 & 228 and Gross Alpha Emitters to levels below the Maximum Contaminant Level (MCL) of 5.4 Pico Curies/liter (pCi/L) and 15.4 pCi/L respectively. In May of 2007 the sample results for Gross Alpha was 27.3 pCi/L and for Radium 226/228 the results were 6.2 pCi/L. After the treatment plant went online, sample results from May of 2009 were as follows; Gross Alpha = <3.0 pCi/L and Radium 226/228 = <1.0 pCi/L; both well below their respective Maximum Contaminant Level. In addition to removing the Radium from the water, the treatment plant will also remove Iron and Manganese that cause odors and discoloration to plumbing fixtures and laundry.

The Water Treatment Plant has an average design capacity of 4.3 million gallons per day and a maximum capacity of 5.3 million gallons per day. The first step in the water treatment process is aeration. The purpose of aeration is to begin the oxidation of iron and manganese to an insoluble form so they can be filtered from the water. The water is pumped from the municipal wells to the top of the aerator. The aerator is comprised of numerous slotted trays through which the water flows. A forced draft fan blows air through the aerator to further aid in the oxidation process.

From the aerator, the water flows by gravity into a 105,000 gallon detention tank which holds the water for approximately 30 minutes. The detention tank allows for further oxidation of the iron and manganese. The chemical sodium permanganate is added after the detention tank to assist in the oxidation of manganese. The radionuclides are filtered out with the oxidized manganese.

After the detention tank, the water flows by gravity into four 18'x 20' filter basins. Each filter basin has a Leopold-type under drain system, reverse-graded gravel and dual-filter media. The under drain system is constructed of a series of blocks approximately 11" wide by 12" high by 48" long made of high density polyethylene (HDPE). The blocks are arranged end to end and mechanically joined to form continuous under drain laterals for the full length of the filter. The reverse-graded gravel is a series of layers of progressively smaller gravel placed on top of the under drain blocks designed to retain filter media. The filter media itself is composed of 15 inches of anthracite and 15 inches of specially graded manganese greensand. The anthracite and greensand filter out the iron and manganese which were oxidized to an insoluble form in the previous stages.

The material that is trapped by the filter beds is removed from the filters by a process called backwashing. Backwashing is accomplished by means of reversing the flow of water through the filter. This process is further enhanced by blowing compressed air up through the under drain blocks. The filter design allows for simultaneous air and water backwashing. This maximizes the cleaning of the filter bed media prior to returning it to service. The backwash water flows to the

reclaim tank. The backwash reclaim tank is located underground, just east of the treatment plant, and has a capacity of 230,000 gallons. The backwash water is held in the tank to allow particles to settle out. The clear water is returned to the beginning of the process, and the accumulated solids are pumped to the sanitary sewer system for treatment at the wastewater treatment facility.

The filtered water flows by gravity to a new 200,000-gallon clear well and 1,000,000-gallon reservoir, which are located under the floor of the High Service pump room. One 100-horsepower vertical turbine pump is mounted on top of the clear well to provide backwash water. Once the clear well is full, the filtered water is chlorinated to provide a disinfecting residual and fluoridated to enhance public dental health. To comply with lead and copper regulations, polyphosphate is added to the finished water, which creates a very thin coating on piping systems thereby preventing leaching of lead and copper into the water. The water is then pumped to the distribution system by three 100-horsepower, vertical-turbine pumps.

The operation of the wells, the treatment plant, and the high-service pumps is automatically controlled by Allen Bradley Programmable Logic Controllers (PLC's). The PC compatible SCADA system software enables the operators to run the treatment plant directly from the control room. All alarm conditions are sent out to the duty operator by an automatic telephone dialer.

The average daily water usage of the City today is about 600,000 gallons, but it can peak at over two million gallons per day on very hot dry summer days due to lawn sprinkling.

Lawn Sprinkling Restrictions: The City of St. Francis has an odd-even watering ban. Odd addresses may water on ODD days only. EVEN addresses may water on EVEN days only. The day BEGINS AT MIDNIGHT and ENDS AT MIDNIGHT. You may not sprinkle between the hours of 10 AM and 7 PM. Restrictions begin on April 1st and run through September 30th. New sod and seed is exempt for 30 days only. You MUST notify the Public Works Dept. at (763) 753-3574 prior to sod/seed installation. Your cooperation is needed to insure an adequate supply of water during periods of high water demand.

Consumer Confidence Report: The [United States Environmental Protection Agency](#) (USEPA) requires public water systems to report annually on the quality of the drinking water provided to their customers. The St. Francis Water Utility welcomes this opportunity to communicate with and inform you, the customer, about the water product you purchase and use on a daily basis. A copy of the Consumer Confidence Report (CCR) is published in the Courier Newspaper in June or July. The CCR also available for viewing on the city's web site at www.stfrancis.govoffice.com, click on "City Departments" and then click on "Public Works" and scroll down to the end of the page.

Rusty Water, Taste, and Odor Problems: The source of St. Francis drinking water is deep wells. Well water is typically high in dissolved minerals such as Iron and Manganese, which can cause rust, taste and odor problems at times. These types of problems generally occur on dead end distribution lines or during construction or flushing activities. Please call the Public Works Department at 763-753-3574 between 7:00 a.m. – 5:30 p.m. to report these types of problems.

Water System FAQs

Is my water safe to drink?

Definitely! St. Francis water meets all of the [Environmental Protection Agency's](#) health and aesthetic standards for safe drinking water.

Is the water in St. Francis hard?

St. Francis's water is classified as very hard with 13-14 grains per gallon. Water hardness is due principally to calcium and magnesium. Water is generally harder in areas where calcium and

magnesium rich limestone rocks are present. St. Francis pumps its water from aquifers in dolomite/limestone rock formation.

Is there fluoride in my water?

Yes. The groundwater naturally contains a small amount of fluoride. The Water Department then adds more fluoride to bring the total amount to the [Minnesota Department of Health](#) standards (.9 to 1.4 mg/l).

Should I buy bottled water?

This is a personal decision. Remember that US bottled water is less regulated than municipal water and bottled water costs up to a 1,000 times more than St. Francis's water.

Should I install a water filter in my home?

This is a personal decision. A water filter is not required for the municipal water in St. Francis to meet drinking water standards. If the water is not to your liking, then you may want to consider a home treatment unit. Most filters will remove the large chlorine ions, which is added to the water to kill harmful bacteria and fluoride ions, which strengthen teeth.

Should I install a water softener in my home?

St. Francis has very hard water that may cause scale buildup on your fixtures or spots on your dishes. If you are bothered by this a water softener should help. Soft water rinses off better, and you generally use less soap for your dishes and laundry.

What causes the white scale on my sink and fixtures?

Deposits of calcium and magnesium build up over time. These two minerals make up most of the hardness in your water. Hard water is not harmful.

Where does St. Francis's water come from?

Groundwater is pumped from 3 deep wells, ranging from 229 to 417 feet deep. The groundwater is located in the Mt. Simon aquifer (Well #1) and Quaternary Buried Artesian aquifers (Wells #3 & #4). St. Francis has the capacity to pump over 2.5 million gallons per day if needed.

Why do we store water in water towers?

1. A large amount of water may be needed to fight a large fire.
2. When you turn on your faucet water flows out because the water in the pipes is under pressure and is pushed out. The weight of the water in the water tower provides your house with water pressure. The higher the water is above you, the more pressure you have.
3. Excess storage means the well can pump water more efficiently. The wells can pump water all night into storage as we sleep for the large demand when everyone wakes up and gets ready to start their day. Water is also saved over weekdays for weekends when the majority of people use water to clean and do laundry. St. Francis's elevated storage tank can hold 750,000 gallons of water. The Water Treatment Plant, has additional storage of 1.2 million gallons, giving a total storage capacity of 1.95 million gallons.