2021 Water Quality Report

TACOMA WATER

TACOMA PUBLIC UTILITIES

A Message From Your Water Superintendent

Our mission is to provide you, your family, and our community with clean, reliable water. We take this promise seriously and work hard to ensure your drinking water is safe. This annual report shares information about the water we provide and the systems that deliver it. I'm also proud to share with you some key efforts that focus on delivery as we strive to be good stewards of our water distribution system. We continually monitor water quality from the forest to your tap and take pride in being able to offer some of the best drinking water in the country.

This report shows how vast our water distribution system is, which may surprise you. We regularly inspect and repair almost 1,500 miles of water mains and thousands of valves and fire hydrants to keep them in good working condition to maximize their service life. We cannot overstate the importance of maintaining our water system. Water quality can be negatively impacted without proper care.

In 2021, we completed our lead gooseneck replacement project that began in 2016. During this time, we inspected over 1,000 potential lead gooseneck locations and replaced over 300. We removed all known, or suspected, lead goosenecks, and are confident there are not any remaining in our water system. Thanks to our staff and efficiencies, we completed this project on time, and under budget. This report shows the test results meet or exceed all state and federal drinking water regulations, including the federal Lead and Copper Rule.

Another way we ensure quality drinking water is to conduct regular flushing of water mains. We improve water quality with increased flow rates during flushing which remove naturally-occurring debris and sediment, and bring fresh water into the area. Flushing helps provide excellent water quality and improves system reliability.

Finally, we showcase a few fantastic individuals in our utility who work hard for you every day. I'm proud to work alongside them as we fulfill our promise to you. Thank you for allowing us to serve you.

Scott Dewhirst, Superintendent

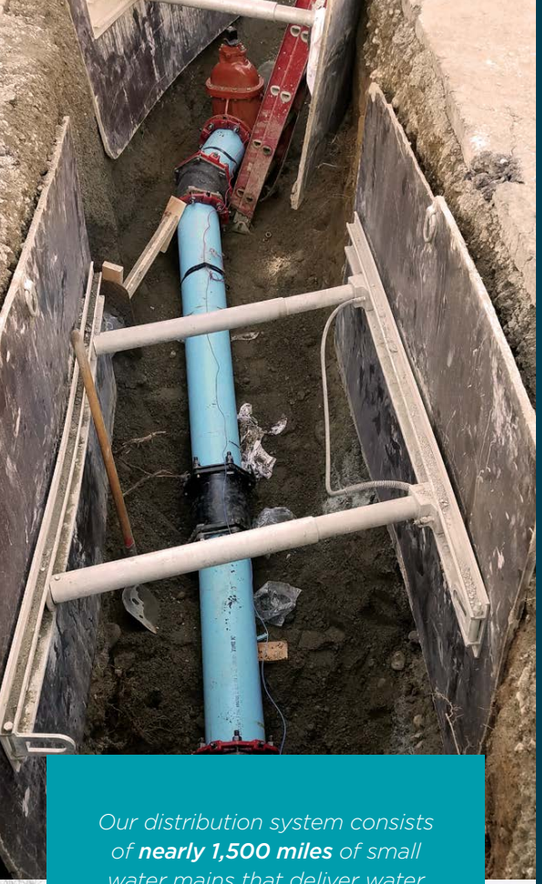
TACOMA WATER
TACOMA PUBLIC UTILITIES

▼ The Green River provides 95% of our drinking water.

An Important Message From the EPA

Your drinking water currently meets the EPA's revised drinking water standard for arsenic. However, it does contain low levels of naturally occurring arsenic not associated with known sources of industrial contamination. There is a small chance that some people who drink water containing low levels of arsenic for many years could develop circulatory disease, cancer, or other health problems. Most types of cancer and circulatory diseases are due to factors other than exposure to arsenic. The EPA standard balances the current understanding of arsenic's health effects against the costs of removing arsenic from drinking water.

EPA United States Environmental Protection Agency



*Our distribution system consists of **nearly 1,500 miles** of small water mains that deliver water from the Green River Watershed to homes and businesses.*

▲ A construction crew replaces a water main.

Advantages of Replacing Water Mains

Although the primary driver for replacing water mains is risk-based, we also replace mains for various other reasons, including water quality, system improvements, and partnering with local entities to replace underground pipes on larger construction projects.

Our distribution system consists of nearly 1,500 miles of small water mains that deliver water from the Green River Watershed, and our groundwater wells, to homes and businesses.

A water distribution main exists beneath almost every street in our service area. We install new pipes every year, while others are over 100-years old. The expansive size and varying age of the system requires an effective management and replacement program.

The age, size, and location of a water main can contribute to the quality of the water we serve. Older mains, or pipes, may have years of built-up sediment due to the water system being unfiltered for over 100 years.

Determining when we should replace a specific pipe is the core strategy of our replacement program. In the past, we used life cycles for pipes and replaced them once a pipe reached a certain age. However, today our replacement approach is more advanced and uses historical system data like size, material, location, and age, to determine the risk of using a specific pipe. When the risk of using a pipe equals our cost to replace it, that is the optimal time for replacement. Replacing a pipe beforehand can leave years of useful life, while replacing it after increases our risk costs. Ongoing maintenance of our water system helps keep costs down and ensures we continue to provide clean, reliable water.

Your Drinking Water is Safe

In April 2016, following the Flint Michigan lead incident, we identified some older service pipes connected to small 3-foot lead gooseneck pipes. We committed to our customers and the Public Utility Board to remove all known lead goosenecks from the water system within five years.

During the early stages of the replacement project, we tested the impact of the lead goosenecks on water inside our customers' homes. That testing concluded the lead in water remained below EPA action levels and the water was safe to drink.

We subsequently conducted a study to determine the quantity and location of potential lead goosenecks. We sometimes found goosenecks on services 2-inches or smaller, installed before 1940, and connected to a galvanized pipe. About 1,215 possible locations met this criteria and needed further investigation.

Afterward, we launched the five-year lead gooseneck replacement project, budgeted at $10 million, which assumed replacing every service of the 1,215. The highest cost of replacing a service is repaving streets and reconstructing sidewalks.

During implementation, we determined our field personnel could dig a small hole over the service lines (referred to as "potholing") to see if a lead gooseneck was present before replacing them. By the end of the project, 418 of the potential goosenecks didn't need replacement, saving over $2 million. Additionally, coordination with other projects and partnering on paving contracts with the City of Tacoma Department of Public Works saved an estimated $2 million. We retired or renewed about 428 service lines that didn't have a lead gooseneck attached due to age and project coordination. Ultimately, we found and removed only 342 lead goosenecks of the initial 1,215. Thanks to efficiencies and due diligence, the total cost was about $6 million.

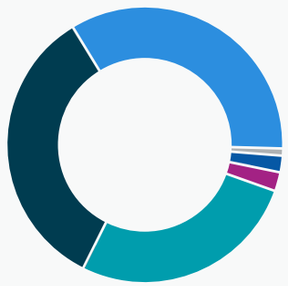
Additionally, we implemented a lead testing program for customers. During COVID-19 we suspended the program for two years, but it has resumed and we are processing all requests. If you request a water test kit, then complete and return it, we will analyze your water for lead at a laboratory certified by the State of Washington for free.

You can find more information or request a kit at **MyTPU.org/Lead**.

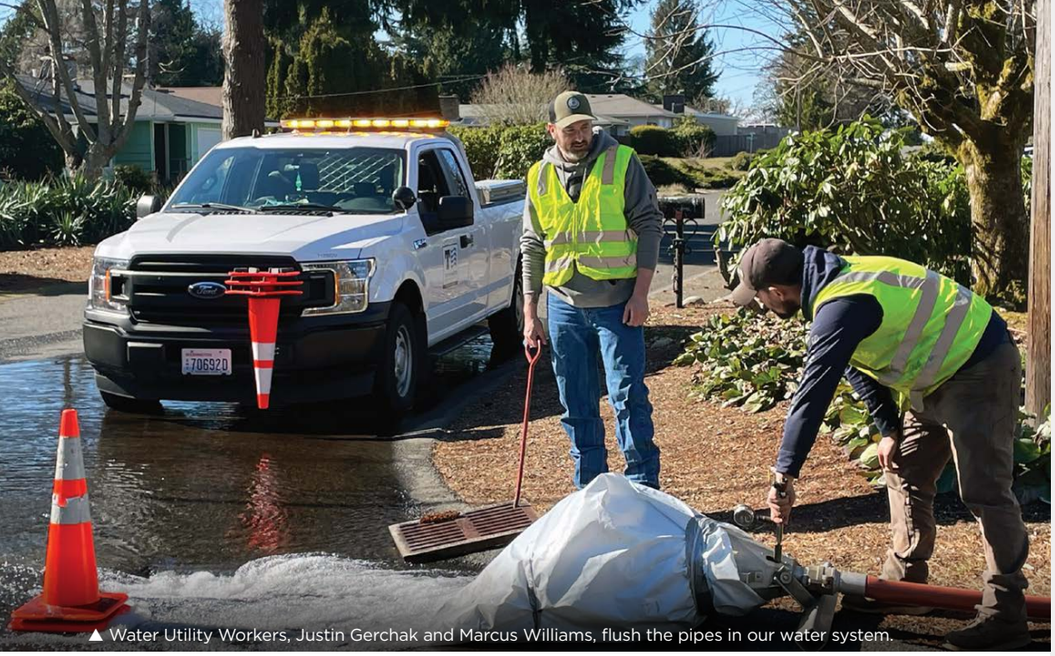
All known goosenecks are removed.

▲ Old lead gooseneck that has since been removed.

BREAKDOWN OF RESOLVED LEAD GOOSENECKS



- 1% RETIRED – lead gooseneck found
- 2% RETIRED – no lead gooseneck found
- 2% OTHER
- 27% RENEWED – lead gooseneck found
- 34% RENEWED – no lead gooseneck found
- 34% CONFIRMED – no lead gooseneck



▲ Water Utility Workers, Justin Gerchak and Marcus Williams, flush the pipes in our water system.

Flushing Water Mains Ensures Clean, Reliable Water

There are many reasons the water coming out of a fixture may not be crystal clear. They include customer-side older galvanized pipes and maintenance such as replacing a faucet or cleaning/draining a hot water tank. This work can introduce air into the water lines and release corrosion particles from the sides of pipes. Another source of discolored water can be the water main in front of your home. We carefully control and monitor water chemistry, but similar to your home plumbing, the water mains are susceptible to some corrosion. Until 2015, Tacoma's water was unfiltered, meaning we took water straight from the Green River, adjusted chemistry for pH and chlorine, added fluoride, and delivered it. We were one of few utilities allowed to remain unfiltered because of our protected watershed and water source. The unfiltered water resulted in the introduction of some sediments into the water system. The deposits typically remain unseen at the bottom of the pipes because your water connection is at, or near the top, of the main. Fire hydrant use, system maintenance, and water main breaks can cause these particles to become suspended and appear in your home's water. We actively work to remove the particles through ongoing flushing. We have two primary types of flushing activities: **dead-end flushing** and **unidirectional flushing**. Dead-end flushing freshens the water in areas with low flow or, as the name implies, areas where the water main ends. Dead-end flushing will not usually disturb the water quality inside your home because we flow the water at a low rate. Unidirectional flushing involves crews isolating portions of the water system and flowing water from fire hydrants at a high velocity. Isolating parts of the system and increasing the flow rate causes the sediments and corrosion particles to lift off the bottom of the water main and flush out of the hydrant in a controlled way. Unidirectional flushing may result in discolored water at your home if you use the water during the flush. A few weeks before unidirectional flushing begins in your neighborhood, you will receive a letter from us letting you know. We also post sandwich board signs at major intersections and in the immediate flushing area where the crews are working. They will relocate the signs as they move through the neighborhood.

*To learn more about our flushing program, visit **MyTPU.org/Flushing**.*

During water main flushing:

You might see utility crews working at hydrants and valves in intersections and at the end of cul-de-sacs during flushing.

A decrease in your water pressure may occur.

Rust and sediment that stir up will likely discolor your water. The discoloration is temporary, not harmful, and should clear up quickly.

Try not to run the tap or turn on water appliances, such as dishwashers and clothes washers, when flushing is going on in your immediate area.

If your water is discolored, or has sediment, remove any aerators from faucets and run the cold tap for a few minutes.

Ensure your first load of laundry after flushing is dark clothes only.

*If you have questions about flushing, or your water doesn't clear up shortly after flushing is complete, call **253-502-8384**.*

▲ Water flushing ensures clean, reliable water.

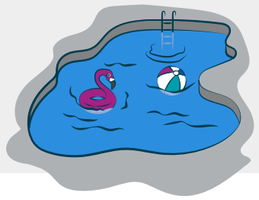
Reporting Chemicals in Your Water

The water quality table below shows substances we identified at the water source, at the treatment plant, and in the distribution system during our most recent sampling. The table doesn't include the other 35 inorganic, 67 volatile organic chemicals, and 73 synthetic organic chemicals we test for—including many industrial chemicals, herbicides, and pesticides—but did not find.

UNDERSTANDING PPM AND PPB

Visualizing 1 ppm

Four drops of water in a 55-gallon rain barrel



Visualizing 1 ppb

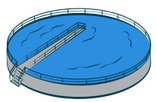
One drop of water in a 13,000-gallon swimming pool

Regulated at our groundwater sources

Constituent	Highest level allowed (MCL)	Highest level detected	Ideal goals (MCLG)	Range of level detected	Regulation met	Potential sources of contaminant
Arsenic	10 ppb	1.7 ppb	0	0 - 1.7 ppb	**Yes**	Natural erosion
Nitrate	10 ppm	4.71 ppm	10 ppm	0 - 4.71 ppm	**Yes**	Agricultural uses, septic
Trichloroethylene	5 ppb	1.4 ppb (2020)	0	0 - 1.4 ppb	**Yes**	Industrial contamination

Unregulated at our groundwater sources

Chloroform	not regulated	0.90 ppb (2020)	N/R	0 - 0.90 ppb Average 0.135 ppb	**N/R**	Industrial contamination

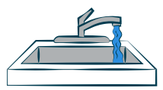


Regulated at our treatment plant

Fluoride	4 ppm	0.89 ppm	4 ppm	0 - 0.89 ppm	**Yes**	Treatment additive
Turbidity	1 NTU	0.070 NTU	N/A	0.013 - 0.070 NTU	**Yes**	Soil erosion

Regulated in our distribution system

Constituent	Highest running annual average allowed	Our running annual average	MCLG	Range of level detected	Regulation met	Potential sources of contaminant
Total Trihalomethanes	80 ppb average	10.8 ppb average	N/A	5 - 24 ppb	**Yes**	Disinfection interaction
Haloacetic acids	60 ppb average	4.0 ppb average	N/A	<1 - 9.8 ppb	**Yes**	Disinfection interaction
Bromate	10 ppb	0	0	0	**Yes**	Disinfection interaction
Chlorine residual	4ppm	N/A	4 ppm (MRDLG)	0.20 - 1.90 ppm	**Yes**	Treatment additive
Total Coliform	<5% positive	0.000%	0	0 of 2113 sites	**Yes**	Sampling technique



Regulated at your tap

Lead and copper sampled in 2019 (required once every three years)	90% of samples must be below the action level (AL)	90% of samples were at or below this level	MCLG	# of sites above the action level (AL)	Regulation met	Potential sources of contaminant
Lead	15 ppb (AL)	N/D	0	0 of 51 sites	**Yes**	Household plumbing
Copper	1.3 ppm (AL)	N/D	1.3 ppm	0 of 51 sites	**Yes**	Household plumbing

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 technology.

Maximum Contaminant Level Goal (MCLG):
The level of a contaminant in drinking water below for which there is no known or expected risk to health. MCLGs allow for a margin of safety.

ppm
One part per million.

ppb
One part per billion.

NTU
Nephelometric Turbidity Unit is a standard to measure water clarity.

AL
Action Level is the concentration which, if exceeded, triggers treatment or other requirements that a water system must follow. Action Levels are reported at the 90th percentile for homes at greatest risk.

Minimum Reporting Level, also known as Method Reporting Limit (MRL):
The smallest amount of a substance we can reliably measure and report in a sample.

N/D
Not Detected (result is below the laboratory minimum detection level).

TT
Treatment Technique is a required process intended to reduce the level of a contaminant in drinking water.

Maximum Residual Disinfectant Level (MRDL):
Highest level of a disinfectant allowed in drinking water.

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.

N/A
Not Applicable.

N/R
Not Regulated (not currently subject to EPA drinking water regulations).

▲ Clean, abundant water helps meet the needs of salmon and wildlife which are vital to our region.

Identifying Substances in Your Water

Tap water and bottled water sources include rivers, lakes, streams, reservoirs, springs, and wells. As water travels over or through the ground, it dissolves naturally occurring minerals and can pick up other substances resulting from the presence of animals or human activity. Those substances may include inorganic material such as salts and metals, synthetic and volatile organic material from industrial processes, storm water runoff and septic systems, and pesticides and herbicides from agriculture and residential uses. To ensure your drinking water is safe, the EPA and the Washington State Board of Health prescribe regulations that limit the amount of certain contaminants in public water systems.

Organisms

Cryptosporidium (KRIP-toe-spo-RID-ee-um)

Cryptosporidium is a microscopic organism commonly found in open surface water sources. Swallowing Cryptosporidium can cause diarrhea, fever, and other stomach and abdominal symptoms. We tested the Green River for Cryptosporidium on a monthly basis from 2015 – 2017. We collected and analyzed samples using the best available method approved by the EPA. We did not detect Cryptosporidium in the untreated Green River during this period. Federal and state regulations require us to treat Green River water for Cryptosporidium. We remove any Cryptosporidium that might be present effectively with filtration. We have had no reported instances of Cryptosporidium-related health problems in our service area.

Giardia (GEE-are-DEE-uh)

Giardia lamblia is another microscopic organism commonly found in open surface waters such as rivers, lakes, and streams. Federal and state regulations require us to treat Green River water for Giardia. We kill Giardia effectively with disinfecting chemicals like chlorine and ozone.

Gases

Radon

Radon is a naturally occurring radioactive gas. Breathing radon can cause lung cancer in humans. Ninety-eight percent of detected radon comes from indoor air generally released from soil beneath homes. Radon can release from tap water, but in much smaller quantities – only about 1% of radon exposure comes from drinking water. We test for radon in our groundwater sources. Federal guidelines require drinking water to contain no more than 4,000 picocuries per liter (a picocurie is a measure of radiation). We took 115 samples and tested them between 1992 and 2021. Findings show an average of 291 picocuries per liter. Our largest single test shows 530 picocuries per liter.

Minerals

Lead and Copper

Studies cited by the EPA show swallowing lead or copper can cause health problems, especially in pregnant women and young children. Lead and copper found in drinking water usually come from home plumbing. Some homes have higher levels than other homes. Water with a low pH can cause copper to dissolve directly from pipes into water and lead to dissolve from solder used to join copper pipes. Lead-based solder was banned in 1986, but small amounts of lead can still be found in many brass-plumbing fixtures and can slowly dissolve into water after standing in pipes for a long time.

Federal and state drinking water rules establish "action levels" allowable for lead and copper in water samples collected from homes. At least 90% of samples may have no more than 15 parts per billion (ppb) of lead in one liter of water and no more than 1.3 parts per million (ppm) of copper per liter. Once every three years, we sample at least 50 homes for lead and copper.

We completed the most recent sampling in 2019. Results show our system met action levels for both lead and copper. Although we detected lead in a few homes, all were at levels below the 15 ppb action level. To continue ensuring we meet regulatory requirements, we will continue to monitor and adjust pH levels to reduce corrosion in pipes. We will sample again for lead and copper in 2022.

Pregnant women and young children can be more vulnerable to lead in drinking water than the general population. If you have concerns about lead levels in the water at your home, have your water tested. Running water for two minutes after it sits stagnant in the pipe for a few hours can help clean the tap and reduce the amount of lead and copper in your water. A change in the temperature of water will also tell you when fresh water arrives.

▶ Watershed Inspector Scott Pries monitors the Green River for water quality.

UNDERSTANDING PICOCURIES

The curie (Ci) is a standard measure for the intensity of radioactivity contained in a sample of radioactive material.

A picocurie (pCi) is a measure of the rate of radioactive decay of radon. **One pCi is one trillionth of a curie.**

1 pCi
=
0.000000000001 Ci

Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline, ***1-800-426-4791*** *or at* ***EPA.gov/SafeWater/Lead****.*

Sand and Silt

Because we take our water from the Green River, which, prior to 2015, was an unfiltered water source, pipeline shutdowns and fire flows from hydrants can stir up sand and silt that sits in the bottom of water mains throughout the water supply system. Even though the water is treated, turbid events like these can cause water to appear visually unpleasant, but it remains safe.

EMPLOYEE SPOTLIGHT

Jennifer Routh

Maintenance & Construction Planner

As a planner, my role is to review upcoming capital improvement projects and determine the work our field crews must complete. I study the historical data to assess the age, condition, and material types of our existing services, hydrants, and valves. I use the information to see where we should make replacements and improvements. This review helps ensure our water structures are in good working order and meet the most current water quality standards.

The recent lead gooseneck project is an example of the vital role of planning in our utility. Due to a lack of historical data on these services, each one had to be dug up by hand. Our field crews would then assess the condition of the service and either update or replace it. We did this work strategically to ensure our crews could do their job efficiently. The services were grouped into neighborhood sections and completed equitably across our service area. To be as fiscally responsible as possible, we looked for locations where we could finish our lead gooseneck work by coordinating with other improvement projects. We completed this to ensure you could feel secure knowing that any potential lead is removed from your service line.

I find my job very rewarding due to projects like this. I collaborate with many great people within our utility and the communities we serve. My focus is to ensure our crews have everything to do their jobs effectively. Due to their hard work, you can feel secure that you receive clean, reliable drinking water now and for many years.

Treating Your Water

In addition to filtering your water, in 2021 we treated our Green River drinking water supply with chlorine, fluoride, caustic soda, and ozone. Treating water with the chemical disinfectants, chlorine and ozone is important to protect your health when water is drawn from a surface supply like the Green River. Placing disinfecting chemicals in water kills bacteria and other microorganisms, making it safe to drink.

Fluoride

Tacoma voters approved fluoride treatment in 1988 and 1989 because of the dental health benefits it provides. The Tacoma City Council then enacted an ordinance directing fluoridation of our water supply. We currently fluoridate at a level of 0.7 ppm.

Caustic soda

We treat our Green River water supply with caustic soda to raise the pH (a measurement of acidity) of the water, making it less corrosive on plumbing and reducing the amount of lead and copper that can dissolve into your drinking water.

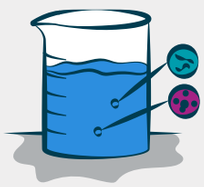
Ozone

Algae and other organic material in the Green River can create an objectionable taste and odor in your drinking water. We treat the Green River water supply with ozone, which effectively destroys any undesirable taste and smells that can occur and provides disinfection benefits to help ensure your water remains safe to drink. Ozone gas generates when we expose pure oxygen gas to electricity in an ozone generator. After creating ozone gas, we combine it with water and inject into pipeline reactors at the Green River Filtration Facility. Ozone only lasts for a few minutes in the water and is not present in the water supply when it leaves the treatment site.

Chlorine

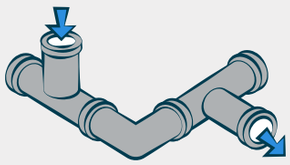
Chlorine is our primary disinfection treatment. While it does an excellent job of killing the microorganisms that may be harmful to you, chlorine also reacts with the natural organic material commonly found in surface water sources like lakes, rivers, and streams. This reaction forms compounds called "disinfection byproducts." We must meet drinking water standards for two groups of disinfection byproduct compounds.

Byproduct levels found in water depend primarily on:



The amount of natural organic material in your water

The amount of chlorine used to treat your water



The amount of time it takes your water to reach you

Byproduct levels vary throughout the year. Byproducts often increase during the warmest months when our water supply has its highest levels of natural organic material and chemical reactions happen faster. We work to minimize byproduct levels and have adjusted portions of our system operations.

▲ Ductile iron water pipe.

EMPLOYEE SPOTLIGHT

Maurice Jackson

Water Utility Worker

As a water utility worker, my job is to flush and sample the dead-end of water mains throughout our distribution system to maintain high quality water. I test turbidity, pH, chlorine levels, and the temperature of the water. I flush the water at a low flow to minimize turbidity. There are times when I may have to respond to a dirty water call. In this case, I would work closely with our water quality specialist to see where the best places would be to flush so we can continue to supply high-quality water.

I enjoy my job because not every day is the same, and it comes with different challenges. I get to work with some pretty cool people and do some interesting work. I am very blessed to be able to do the work that I love.

▲ Pipeline 1 water pump station at Green River Filtration Facility.

Delivering Your Water

Most of your water comes from the Green River in South King County. The Green River Watershed is a 231-square-mile forested area that serves as a collection point for melting snow and seasonal rainfall in an uninhabited area of the Cascade Mountains between Chinook and Snoqualmie Passes. We own land along the river, which is about 11% of the watershed.

Through agreements with other landowners, we limit watershed access and carefully control activities that can impact water quality. We also own and operate seven wells on the North Fork of the Green River and take water from them during periods when Green River water is turbid. We supplement the Green River supply with groundwater from more than 20 additional wells to meet peak summer demands. Most are in Tacoma city limits.

Keeping you healthy

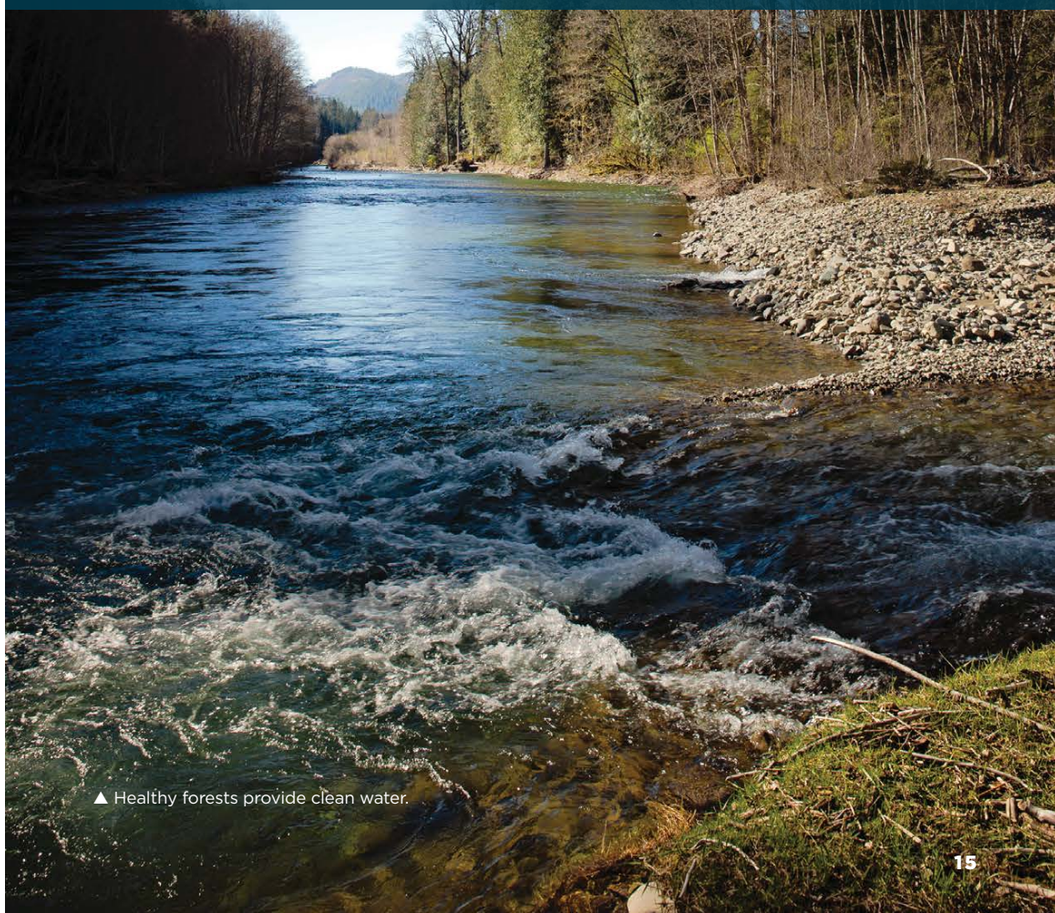
Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline, **1-800-426-4791**.

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 Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline, **1-800-426-4791.**

The importance of conserving water

When each of us uses only as much water as we need, we conserve water. Conservation makes it possible to plan and provide for residential and commercial development, take only what we need from reservoirs and wells, and leave more water in the river for fish. When we each do our part, we help ensure enough water remains available to meet the needs of wildlife and our growing community.

The Washington State Department of Health requires city water suppliers to establish a water conservation goal and report progress each year. Our water conservation goal is to reduce summer (May – October) water use by 6.65% per person from 2018 to 2028. Every family and business that uses water outdoors—for gardens, yards, and landscaping—plays a part in helping us reach that goal. Read the plan at **MyTPU.org/WaterSystemPlan** and learn about our conservation programs and tips at **MyTPU.org/WaterSmart**.



▲ Healthy forests provide clean water.

Tacoma Public Utility Board

The Tacoma Public Utility Board is the governing and policy-making body for Tacoma Water. To be involved in water quality decisions, you may participate in public meetings, held on the second and fourth Wednesdays of each month at 6:30 p.m. in the Tacoma Public Utilities Auditorium, 3628 S. 35th St. in Tacoma. Meetings are also held virtually via Zoom Meetings and televised live on TV Tacoma. For details, go to **MyTPU.org**.

Your Water Quality Report

This report contains information about your drinking water. Congress and the EPA require us to inform you annually about your drinking water and its impacts. Although most content in this report is required, we are pleased to share additional helpful information about your water and the work we do to get it to you. We produce and mail this report for about 45 cents per customer.

Contact information

Water Quality
253-502-8384 • **WaterQuality@CityofTacoma.org**

Conservation
253-502-8723 • **MyTPU.org/WaterSmart**

Cross Connection Control / Backflow Prevention
253-502-8215 • **MyTPU.org/BackFlow**

Rates
253-441-4942

National Radon Hotline
1-800-55-RADON • 1-800-557-2366

Washington State Department of Health
DOH.WA.Gov/ehp/dw

U.S. Environmental Protection Agency
Safe Drinking Water Hotline
1-800-426-4791 • **EPA.Gov/SafeWater**

MyTPU.org/WaterQuality

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