

A full-page background image featuring a worker in a white hard hat and safety vest, using a tool on a pipe. The worker is positioned on the left side of the frame, with a body of water on the right. The image is split diagonally, with the top-left portion in black and the bottom-right portion in a teal color. The text 'WATER QUALITY' is centered in a white box with an orange border, and '2017' is written in orange below it.

# WATER QUALITY

2017

**TACOMA**  **WATER**  
TACOMA PUBLIC UTILITIES

# FOCUS



## *New leadership; fresh perspective*

At Tacoma Water we take great pride in providing you with safe, reliable drinking water now and into the future. I have spent my career in the public and private sectors of the water industry. It is my pleasure to serve you as Tacoma Water's new superintendent and I am excited to lead a great team of people working to provide you with high-quality water. My goal is to ensure Tacoma Water continues to meet the drinking water needs of our community, which I, too, now call home.

The Tacoma area is fortunate to have a robust and diverse supply of high-quality drinking water. Like many systems across the country, improvements to water fixtures, environmental awareness promoting water conservation, and general changes in water system demand patterns have reduced the amount of water we need to use from the system. As a result, we must continually re-evaluate and understand how best to optimize the water system that was built to support higher demand for water. This re-evaluation process has become a new norm and part of our ongoing work.

Our team commits to effectively managing Tacoma Water's assets. The bottom line is we want to continue to provide you with safe, reliable, high-quality drinking water at the most affordable and responsible price possible. Our goal for this report is to inform you and encourage open dialogue about the quality of your water. We welcome your input and feedback. Feel free to contact us using the information located on the back cover of this report.

On behalf of Tacoma Water, thank you for letting us serve you.

A handwritten signature in blue ink, reading "Scott Dewhirst".

Scott Dewhirst  
Tacoma Water Superintendent



# PLANNING & STRATEGIES

## *Managing the water supply with an integrated plan*

Our Integrated Resource Plan (IRP) helps us manage and maintain a portfolio of resilient water supplies to meet our community's needs with an appropriate level of certainty. We rely on the Green River as our primary source of drinking water. The Green River water supply has constraints at times due to changes in the weather, environmental commitments, and the need to provide minimum instream flows for fish and wildlife. Well water (groundwater) makes up only about 5% of our water supply in most years. However, we can use well water when a drought occurs to supply up to 50% of our community's water needs during the summer. Other uncertainties exist, such as climate change, water law, and population growth that can impact our water sources. The IRP helps us anticipate change, prepare, and adapt.

The IRP highlights several tools that help us plan for the future. One key tool under development, called the Water Yield, Supply and Demand Model, uses data and projections to estimate the amount of water available for use. This model allows us to plan for the amount of water available (capacity) by determining the probability of future water supply constraints up to multiple decades in advance. This tool will help us model current water conditions and plan for future drought. Three scenarios under consideration describe distinct, reasonable, and plausible assumptions and outcomes that could significantly affect the future of our water resources. The IRP also includes a beneficial groundwater system analysis that provides a look into the future of our well water sources and a water conservation program assessment that looks to promote our community's efficient use of water.

We value community input as part of our IRP process. A Public Advisory Committee, representing diverse perspectives, has provided input throughout the project. This process for public feedback helps us increase awareness and gather insights for making policy decisions.

The updated IRP will publish in 2018, and includes a recommendation for managing our water resources in the most cost-effective and environmentally responsible way. The strategy will help us make decisions relating to our water supplies, including how much well water to keep available.

## *Studying and adjusting for corrosion control*

Treating our water sources to control corrosion helps us ensure your drinking water remains safe. We add sodium hydroxide (also called caustic soda) to raise the pH (a measurement of acidity) of the water supply, which makes it less corrosive to household plumbing. This reduces the potential for lead and copper that could be released into your drinking water. We have treated the Green River water supply in this manner since the 1990s and the South Tacoma groundwater supply wells since 2014. We continue working to ensure the levels of lead and copper in your water are well below Federal and Washington State Health Department standards.

A recent study of our water system used historical system data, new industry research, and pilot testing to ensure we provide excellent corrosion control. Pilot testing involved "harvesting" old parts of pipes from our water system, installing them in test pipe loops, and exposing the pipe to certain water sources at prescribed times throughout the day to mimic household water use. We collected water samples weekly for seven months and analyzed them for lead, copper, and other water quality parameters. We also examined parts of pipes. Results show that our existing corrosion control practices provide excellent lead and copper control. We will increase pH and alkalinity (the capacity of the water to resist changes in pH) slightly to further optimize and control corrosion. We also found that chlorine in the water supply (which nearly all water systems already use to ensure the water is safe from microbiological risk) further prevents lead from dissolving in the water. Over the next several years we plan to install corrosion control treatment on lesser-used groundwater supply wells to ensure the quality of the water in those wells remains consistent and ready for use when we need it.

# Highlighting our plan for the water system

## REPORTING CHEMICALS IN YOUR WATER

The water quality table at the right shows substances we identified at the water source, treatment plant and distribution system during our most recent sampling. The table does not include the other 59 volatile organic chemicals and 73 synthetic organic chemicals we test for—including many industrial chemicals, herbicides and pesticides—but did not find.

For more information, contact us at (253) 502-8215 or [waterquality@cityoftacoma.org](mailto:waterquality@cityoftacoma.org).

### Definitions

**(MCL) Maximum Contaminant Level:** The highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the MCLG's as feasible using the best available technology.

**(MCLG) Maximum Contaminant Level Goal:** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's 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 which a water system must follow. Action Levels are reported at the 90th percentile for homes at greatest risk.

**MRL** — Minimum Reporting Level, also known as Method Reporting Limit: The smallest amount of a substance that can be reliably measured and reported in a sample.

**ND** — Not Detected, result was below the laboratory minimum detection level.

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

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

**(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.

**NA** — Not applicable (Or not analyzed).

**NR** — Not Regulated (Not currently subject to EPA drinking water regulations).

**pCi/L** — picocuries per liter (measure of radioactivity).

Planning for short- and long-term water conditions helps ensure we provide you with safe and reliable drinking water. The Washington State Department of Health recognizes that and therefore requires utilities to update their Water System Plans every 10 years. This year, we will complete our 2018 Water System Plan update to meet the state requirement; the plan also serves as a valuable resource for customers, staff, partner agencies, and the general public. The plan includes information about the water facilities, processes, and programs in place that help ensure reliable, high-quality healthy water. The plan highlights our objectives in the foreseeable future. We share our Water System Plan with other agencies and make it available for public review prior to final approval by the Tacoma Public Utility Board.

Constituent	Highest Level Allowed (MCL)	Highest Level Detected	Ideal Goals (MCLG)	Range of Level Detected or # exceed AL	Regulation Met?	Potential Sources of Contaminant
<b>REGULATED AT THE GROUNDWATER SOURCES</b>						
Arsenic	10 ppb	6 ppb	0	0 - 6 ppb	Yes	Natural erosion
Barium	2 ppm	0.0044 ppm	2 ppm	0 - 0.0044 ppm	Yes	Natural erosion
Nitrate	10 ppm	4.2 ppm	10 ppm	0 - 4.2 ppm	Yes	Agricultural uses, septic
Trichloroethylene	5 ppb	0.99 ppb	0	0 - 0.99 ppb	Yes	Industrial contamination

### UNREGULATED AT THE GROUNDWATER SOURCES

Chloroform	not regulated	0.69 ppb	not regulated	0 - 0.69 ppb Average 0.15 ppb	not regulated	Industrial contamination
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### REGULATED AT THE TREATMENT PLANT

Fluoride	4 ppm	1.05 ppm	4 ppm	0.50 - 1.05 ppm	Yes	Treatment additive
Turbidity	1 NTU	0.050 NTU	not applicable	0.020 - 0.050 NTU	Yes	Soil erosion

### REGULATED IN THE DISTRIBUTION SYSTEM

Disinfection byproducts	Highest running annual average allowed	Our running annual average	MCLG	Range of level Detected	Regulation Met?	Potential sources of contaminant
Total Trihalomethane	80 ppb average	13.0 ppb average	not applicable	0 - 30 ppb	Yes	Disinfection interaction
Haloacetic Acid	60 ppb average	5.9 ppb average	not applicable	0 - 9.3 ppb	Yes	Disinfection interaction
Bromate	10 ppb	0	0	0	Yes	Disinfection interaction
Chlorine Residual	4 ppm	NA	4 ppm (MRDLG)	0.11 - 1.40 ppm	Yes	Treatment additive
Total Coliform	< 5% positive	0.000 %	0	zero of 2215 sites	Yes	Sampling technique

### REGULATED AT THE CONSUMERS' TAP

Lead & Copper: sampled in 2016; required once every 3 years	90% of taps sampled must be below action level	90% of taps sampled were at or below this level	MCLG	# of sites above the AL	Regulation Met?	Potential sources of contaminant
Lead	15 ppb AL	2.1 ppb	0	zero of 76 sites	Yes	Household plumbing
Copper	1.3 ppm AL	0.049 ppm	1.3 ppm	zero of 76 sites	Yes	Household plumbing



# 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 Department 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 another 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. Samples were collected and analyzed using the best available method approved by the EPA. We did not detect cryptosporidium in the untreated Green River during this period. We have had no reported instances of cryptosporidium-related health problems in our service area.

### Giardia (GEE-are-DEE-uh)

Giardia lamblia is a microscopic organism commonly found in open-surface waters such as rivers, lakes and streams. Like other water systems that use open surface water sources, federal and state regulations require us to treat Green River water for Giardia. We use filtration and inactivate 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 111 samples and tested them between 1992 and 2016. Findings show an average of 291 picocuries per liter. Our largest single test shows 530 picocuries per liter.

## MINERALS

### Lead & 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. The most recent sampling was completed in 2016. Results show our system met action levels for both lead and copper. Although lead was detected in a few homes, all were at levels below the 15 ppb action level. And although 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 2019.

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 or copper in your water.

A change in the temperature of water will also tell you when fresh water arrives.

Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (800-426-4791) or at [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).

### Sand & Silt

Because we take our water from the Green River, which 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 this water is treated, turbid events like these can cause water to appear visually unpleasant, but it remains safe.

Ozone gas is generated when pure oxygen gas is exposed to electricity in an ozone generator. After ozone gas is created, it is combined with water and injected into pipeline reactors at the Green River Headworks. Ozone only lasts for a few minutes in the water, and is not present in the water supply when it leaves the treatment site.

## 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 the 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, to make it less corrosive on plumbing and reduce the amount of lead and copper that can dissolve into drinking water.

## OZONE

We treat the Green River water supply with ozone. Algae and other organic material in the river can create objectionable taste and odor in drinking water. Ozone effectively destroys objectionable taste and odors that can occur in the water and provides disinfection benefits to help ensure water remains safe to drink.

## 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 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 the water
- The amount of chlorine used to treat the water
- The amount of time it takes water to reach the customer

Byproduct levels vary throughout the year. Byproducts often increase during the warmest months when the 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.

# Treating your water

In addition to filtering the water, in 2017 we treated the Green River supply with chlorine, fluoride, caustic soda and ozone.

Treating water with chemical disinfectants, chlorine and ozone is important to protecting your health when water is drawn from a surface supply like the Green River. Placing disinfecting chemicals in water kills germs and microorganisms, making it safe to drink.



A photograph of a dense forest with tall, thin trees and sunlight filtering through the canopy, serving as the background for the top-left section.

## ***An important message from the Environmental Protection Agency***

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. EPA's standard balances the current understanding of arsenic's health effects against the costs of removing arsenic from drinking water.

## ***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, such as recreation, road maintenance and logging.

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.

A photograph of a clear glass being filled with water from a tap, with water splashing and creating bubbles, serving as the background for the right half of the page.

## ***Being water smart***

Conserving water makes it possible to use existing water supplies more efficiently, provides opportunities to develop our regional water supply, and our fish enhancement programs. This helps ensure enough water remains available to meet your needs, the needs of our community, and the needs of wildlife and the environment.

The Washington State Department of Health requires municipal water suppliers to establish a water conservation goal and report on its progress annually. Our water conservation goal is to reduce peak (May – October) per capita water use by 6.65% between Jan. 1, 2018 and Jan. 1, 2028. With this goal, we will focus on efficient use of water outdoors, by homes, businesses, and other institutions. Please see [TacomaWater.com/Smart](http://TacomaWater.com/Smart) to learn ways you can use water more efficiently.

## ***Keeping you healthy***

Drinking water, including bottled water, may be reasonably 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 EPA's Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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).

## 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.

## 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 produced and mailed this report for about 43 cents per customer.

## CONTACT INFORMATION

**Water Quality**  
(253) 502-8207

**Conservation**  
(253) 502-8723

**Cross Connection Control/  
Backflow Prevention**  
(253) 502-8215

**Rates**  
(253) 502-8913

**National Radon Hotline**  
(800) 55-RADON  
(800) 557-2366

**Washington State  
Department of Health**  
doh.wa.gov/elhp/dw

**U.S. Environmental Protection Agency  
Safe Drinking Water Hotline**  
(800) 426-4791  
epa.gov/safewater

**TacomaWater.com**

*The hotline and EPA website offer information about drinking water contaminants and their potential health effects as well as guidelines from the U.S. Centers for Disease Control about appropriate ways to reduce the risk of infection by cryptosporidium and other microbial contaminants. Both sources also offer information about lead in drinking water, testing methods and steps you can take to minimize exposure.*

## TACOMA WATER

TACOMA PUBLIC UTILITIES

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