





**Tolt Watershed, photo courtesy of Seattle Public Utilities:**  
The steep slopes surrounding the Tolt Reservoir form the boundaries of the South Fork Tolt River Watershed and are being reforested to preserve water.

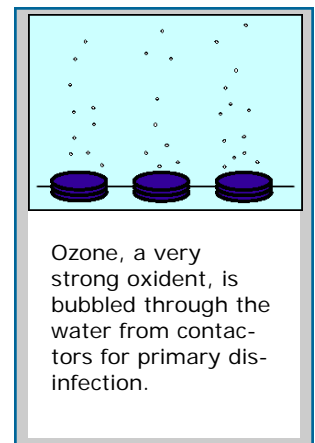
## DRINKING WATER SOURCE

Seattle Public Utilities (SPU) provides many cities and water districts with water to supply their customers. The City of Duvall purchases all of its water from SPU. SPU has a large water main located south of the city limits in the Tolt Pipeline corridor. The City only receives water from the **Tolt Water Supply**, not the Cedar Water Supply.

Two transmission mains connect the City distribution system to the SPU supply system. A two mile long, ten-inch water main extends from the SPU pipeline to the intersection of Third Avenue and Stephens Street. A second twelve-inch transmission main connects to the SPU pipeline where it crosses Big Rock Road and extends to our large storage tank off of Big Rock Road. The type of materials being used for the transmission main consists of Asbestos Cement, PVC, and Ductile Iron.

## WATER TREATMENT

The Tolt Facility treatment process consists of a series of steps. The first step is Ozonation which is adding ozone gas, a powerful disinfectant that destroys cryptosporidium, Giardia, bacteria, and viruses and aids the filtration process. This is followed by coagulation and flocculation (gently stirring the water with small doses of chemicals to bring small particles together to form large particles that can be more easily filtered), filtration (removing the suspended solids by passing the water through a 6-foot deep bed of anthracite), chlorination (adding a secondary disinfectant to provide continued protection in the distribution system against microbial contamination), fluoridation (adding fluoride which helps prevent tooth decay), and corrosion control (adding minerals, which increase the pH and alkalinity, to help reduce corrosion in building plumbing systems). All of these processes are monitored continuously at the facility, which is staffed twenty-four hours a day. To learn more about the Tolt Treatment Facility, see SPU's website at [http://www.seattle.gov/util/About\\_SPU/Water\\_System/Water\\_Sources\\_&\\_Treatment/Tolt\\_Treatment\\_Facility/index.asp](http://www.seattle.gov/util/About_SPU/Water_System/Water_Sources_&_Treatment/Tolt_Treatment_Facility/index.asp) or call their water quality information telephone at 206.615.0827.



Ozone, a very strong oxidant, is bubbled through the water from contactors for primary disinfection.

## DUVALL'S WATER SYSTEM FACTS

Square Miles Served:

Population Served: 5,980

- Single Family Residential: 2,128
- Multi-Family: 40
- Commercial: 107

Average Water Usage

(gallons per month 2009)

- Entire System: 158,028

## DUVALL'S WATER FACILITIES

Water Storage Capacity:

- 2.2 million gallon storage tank
- 0.5 million gallon storage tank

Miles of Water Main (pipe): 35

No. of Fire Hydrants: 346

No. of Pump Stations: 1

No. of Pressure Control Stations: 15

## UPGRADED

The City installed 5,065 linear feet of water lines in 2009.

## THE PURPOSE OF DISINFECTION, AND THE RESULTING DISINFECTION BY-PRODUCTS

Drinking water is disinfected to destroy bacteria, viruses, and Giardia. (Inadequate disinfection may lead to acute gastrointestinal illnesses). However, as the disinfectant reacts with naturally occurring organic matter in the water, disinfection by-products are formed. Disinfection by-products have been linked to increased cancer risks from drinking water containing high levels (greater than the MCLs) over many years. New drinking water regulations provide a balance between required levels of disinfection and the resulting disinfection by-products. SPU's Tolt Filtration Plant improves Duvall's ability to provide a higher level of microbial protection while maintaining or reducing disinfection by-product levels.

## WATER QUALITY MONITORING

SPU staff monitors water quality in the source water, treatment processes, and distribution system 365 days a year. Various compounds are monitored at specific frequencies (continuously, daily, monthly, quarterly, or annually) and locations (prior to treatment, entering the distribution system, and throughout the distribution system) in accordance with federal and state regulations. Many of these tests confirm the absence of various contaminants. Water quality monitoring conducted between January 1 and December 31, 2009 confirmed that there were no contaminants at or above established levels of concern for the general public. Please refer to the data tables in this report for more detailed information on water quality monitoring results.

## WATER CLARITY

Turbidity, a measure of water's clarity, has no direct health effect but indicates the overall quality of the water. High turbidity can reduce the effectiveness of disinfection. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches. SPU's source waters have very low turbidity. The unit of measurement for turbidity is the NTU (Nephelometric turbidity unit). SPU monitors source water turbidity continuously on both the Tolt and Cedar supply. For each

month in 2009, 100% of the treated samples from the Tolt Treatment Facility were below 0.3 NTU.

## SUBSTANCES THAT COULD BE IN WATER

POTENTIAL CONTAMINANT	SOURCE
Microbial Contaminants	Viruses and bacteria from wildlife
Inorganic	Salts and metals which are naturally occurring
Pesticides and herbicides	Agriculture, urban stormwater runoff, residential
Organic	By-products of disinfection processes
Radioactive	Naturally occurring

To ensure that tap water is safe to drink, EPA adopts regulations setting the water quality standards for water systems. The federal Food and Drug Administration regulates contaminants in bottled water and is responsible for providing the same level of public health protection.

## INFORMATION ON THE POTENTIAL FOR HEALTH CONCERNS RELATING TO DRINKING WATER

The sources of all drinking water (both tap water and bottled water) includes 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 can pick up substances resulting from the presence of animals or human activity.

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 EPA's Safe Drinking Water Hotline at 1.800.426.4791, or from EPA's Office of Ground Water and Drinking Water web site at [www.epa.gov/OGWDW](http://www.epa.gov/OGWDW).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immune-compromised people such as people with cancer undergoing chemotherapy, people 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 or the Safe Drinking Water.



**The Regulating Basin, photo courtesy of Seattle Public Utilities:** Water from the Tolt Dam enters the Regulating Basin where it is stored before entering the transmission line.

The table titled "Water Quality Monitoring Results" lists the contaminants detected in 2009 together with their concentrations and possible sources. The following paragraphs describe the significance of a few of these contaminants. Some tests are not required every year; for these test, the concentrations listed are the results of the most recent testing. If you would like a copy of the list of contaminants that are monitored but were not detected in Duvall's water, please call 425.788.3434.

2009 Water Quality Monitoring Results: THIS IS WHAT IS IN YOUR TAP WATER								
DETECTED PARAMETER & UNITS	Tolt Supply		Cedar Supply		This level or less is ideal	This much is allowed	Is your water safe?	Typical Sources
	AVERAGE	RANGE	AVERAGE	RANGE	MCLG*	MCL*	Compliant?	
Total Organic Carbon, ppm	1.3	1.2 – 1.6	0.6	0.3 - 0.9	NA	TT	YES	Naturally present in environment
Cryptosporidium #/100L	ND	ND	ND	ND	NA	NA	YES	Naturally present in environment
Total Coliform, % of positive samples	Highest Month = Annual Number =				0	5%	YES	Naturally present in environment
CLARITY (Measured After Treatment)								
Turbidity, NTU	0.07	0.05-0.19	0.4	0.2-2.6	NA	TT	YES	Soil runoff
INORGANIC AND ORGANIC PARAMETERS (Measured After Treatment)								
Fluoride, ppm	1.0	0.8-1.1	0.98	0.9-1.0	4	4	YES	Water additive that promotes strong teeth (Our target is 1 mg/L)
Barium, ppb	1.0	(one sample)	1.2	(one sample)	2000	2000	YES	Erosion of natural deposits
Nitrate, ppm	0.15	(one sample)	0.07	(one sample)	10	10	YES	Erosion of natural deposits
DISINFECTANTS and DISINFECTION BY-PRODUCTS (Measured in the Distribution System)								
Total Trihalomethanes, ppb	34		31		NA	80	YES	By-product of drinking water chlorination
Haloacetic Acids (HHA), ppb	33		23		NA	60	YES	By-product of drinking water chlorination
Chlorine, mg/L	2.6		3.0		MRDLG=4	MRDL=4	YES	Water additive used to control microbes

## DEFINITIONS

**MCLG:** *Maximum Contaminant Level Goal* — 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* — 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.

**MRDL:** *Maximum Residual Disinfectant Level* — The highest level of a disinfectant allowed in drinking wa-

ter. There is convincing evidence that addition of a disinfectant is necessary or control of microbial contaminants.

**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.

**TT:** *Treatment Technique* — A required process intended to reduce the level of a contaminant in drinking water.

**NTU:** *Nephelometric Turbidity Unit* — Turbidity is a measure of how clear the water looks. The turbidity MCL that applied to the Cedar supply in 2007 is 5 NTU, and for the Tolt it was 0.3 NTU. 100% of the samples from the Tolt in 2007 were below 0.3 NTU.

**NA:** *Not Applicable*

**ND:** *Not Detected*

**ppm:** *1 part per million = 1 mg/L = 1 milligram per liter.*

**ppb:** *1 part per billion = 1ug/L = 1 microgram per liter.*

**1 ppm = 1000 ppb**

**CRYPTOSPORIDIUM**

Cryptosporidium parvum is a protozoan pathogen (disease-causing organism) commonly found in the natural environment. Most rivers and streams across the country have detectable concentrations of this pathogen. In SPU's surface water sources include deer, elk, and voles in the watersheds. The Ozonation disinfection method at the Tolt Filtration Plant is very effective at destroying Cryptosporidium and other microbial organisms. SPU monitors for Cryptosporidium in the source water (prior to treatment). Cryptosporidium samples are not required to be collected from the Tolt supply due to removal and inactivation of Cryptosporidium by the Tolt Filtration Plant; however, SPU began collecting samples in 2005. Cryptosporidium was not detected in any of the 4 samples collected in 2009 for either the Tolt or Cedar.

**RESIDENTIAL TAP MONITORING FOR LEAD AND COPPER**

Our source waters do **not** contain lead or copper. However, lead and copper can leach into residential water from building plumbing systems containing copper plumbing, lead-based solder, brass fixtures, or some types of zinc coatings used on galvanized pipes and fittings (individual water services, not water mains). Homes built or plumbed with copper pipe prior to the 1985 King County lead solder ban would have likely used lead-based solder, and are considered "high risk" under EPA's criteria. Brass fixtures, regardless of age, generally contain some lead. Metals can leach into building plumbing systems when water is stagnant for extended periods of time (six hours or greater).

By regulation, lead and copper monitoring is conducted at "high risk" homes. Samples are collected from these homes after the water is allowed to stand in the pipes overnight. We are required to report the "90th percentile" result of the testing. This means that 90 percent of the high-risk homes have concentrations less than the reported value and 10 percent have concentrations higher than the reported value. Lead and copper monitoring was conducted most recently in 2008 and were both at or below the action levels. The sampling round was in the summer of 2008. Compliance is determined on a regional basis.

<b>LEAD AND COPPER MONITORING RESULTS (TOLT WSA)</b>					
Parameter and Units	MCLG	Action Level+	2008 Results*	Homes Exceeding Action Level	Source
Lead, ppb	0	15	12	4 of 51	Corrosion of household plumbing systems
Copper, ppm	1.3	1.3	0.20	0 of 51	

\* 90th Percentile: i.e. 90 percent of the samples were less than the values shown.  
 + The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline 800.426.4791 or at [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).

<b>ADDITIONAL WATER QUALITY SAMPLING</b>		
PARAMETER & UNITS	CEDAR SUPPLY	TOLT SUPPLY
Alkalinity, Total (as CaCO <sub>3</sub> ) ppm	18.1	18.9
Calcium, (as CaCO <sub>3</sub> ) ppm	21.8	26.2
Hardness, (as CaCO <sub>3</sub> ) mg/L	25.0	26.7
Hardness, (as CaCO <sub>3</sub> ) grains/gal.	1.45	1.54
Iron, ppb	71	39
Manganese, ppb	4.4	1.2
pH, range (January-June 2009, 10-90th percentile)	7.86-8.49	8.22-8.43
Potassium, ppm	.24	.13
Sodium, ppm	1.86	.95
Sulfate, ppm	ND	1.2
Temperature, annual range, C°	4.6-23	3.3-22

SPU monitors several parameters in the interest of our customers. The table on the right lists the water quality information most recently requested.

*Note: abbreviation definitions available on page 4.*

## Water Conservation Information

### CAN YOU BE MORE EFFICIENT?

An average single-family household in Seattle uses 4,040 gallons a month in the winter and 5,759 gallons a month in the summer. Is your water use above average? Or do you want to increase your water use efficiency? Here are some easy ways to save water. You can find even more ways to conserve at [www.savingwater.org](http://www.savingwater.org), including rebates on water-saving appliances and fixtures.

- Wait to wash cloths until you have a full load.
- Switch to an efficient showerhead—and take a shorter shower.
- Match the right plant to the right place in your garden. Subscribe to the Savvy Gardener Electronic Newsletter: [http://www.savingwater.org/outside\\_savvygardener.htm](http://www.savingwater.org/outside_savvygardener.htm).
- Adjust your lawn and/or gardening watering schedule for optimum efficiency (see how at [www.iwms.org](http://www.iwms.org)).
- Don't run the water while brushing your teeth.
- Find and repair any water leaks: <http://www.savingwater.org/inside.htm#leaks>.
- Look for the WaterSense label on new appliances: <http://www.epa.gov/watersense/products/index.html>.

### TOP THREE THINGS YOU CAN DO TO CONSERVE WATER

#### INDOORS

##### Replace old Toilets

- Replacing an old toilet with a new WaterSense model saves an average household almost 30 gallons per day—and up to \$260 a year.



##### Upgrade Washers

- Upgrading an old clothes washer to a new WashWise qualified machine saves an average household\* 27 gallons per day. WashWise certified machines also save energy and use less detergent.



##### Find and Fix Leaks

- Fixing leaks saves an average of 10 gallons per day per household. Check your toilet for leaks yearly. Visit [savingwater.org](http://savingwater.org) to find out how.



#### IN YOUR YARD

##### Right Plant, Right Place

- Match plants to the conditions in your yard— if you have wet, shady areas, choose plants that thrive there, and the same with dry, sunny areas. If plants are well-suited to their place in your yard, you won't need to water so much.\*\*

##### Cultivate your Soil

- Healthy soil holds water and gives plants the nutrients they need to stay beautiful. Add compost and mulch to your beds to slow the weeds and hold water near plant roots, where needed.\*\*

##### Reduce Water Waste

- When you water, make sure the water gets to the roots, where plants need it. Drip irrigation systems avoid shooting water up into the air, where much of it evaporates.\*\*

\* Based on a four-person household

\*\* Water savings vary depending on the size and design of your landscape.

### WHAT YOU DO TO CONSERVE HELPS SALMON, TOO

Healthy rivers with ample clean water are essential for healthy salmon populations. Everything you do to use water wisely – washing full loads, turning off the faucet, taking shorter showers, choosing plants that are right for the site, watering the lawn no more than it needs – helps keep water in our rivers and streams. Conserving is especially important in the summer and early fall, when river flows are lowest. Thank you for all you're doing to conserve water! Many of these practices save energy and protect the water quality of Puget Sound as well.

*Thank you for all you're doing to conserve water. It makes a difference!*

## LOOKING INTO THE FUTURE

Thank you for helping us continue providing your family with clean, quality water this year. This has been a community effort. In order to maintain a safe and dependable water supply we sometimes need to make improvements that will benefit all of our customers. Last year's improvements included updating computer controls for the water system, reconstructing mainlines and providing improved flow and water quality in the system. The City has completed installing and is using the Radio-Read meter reading system. Thank you for your understanding and support. Due to recent events throughout the nation, we have heightened the security of our water supply network and tried to limit the access to the system for your protection.

We at the City of Duvall work around the clock to provide top quality water to every tap. We ask that all our customers help us protect our water supply, which is the heart of our community, our way of life, and our children's future.

For more information on this report, or any questions relating to your drinking water, please call the Public Works Department at 425.788.3434. For Billing or Consumption Records / Questions contact the Utility Billing Clerk at 425.788.1185.



**Tolt Reservoir photo courtesy of Seattle Public Utilities:**

*At 1765 feet above sea level, the Tolt Reservoir is the primary water storage area in the Tolt River Watershed.*

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**City of Duvall**

Public Works Dept.  
14525 Main Street NE  
PO Box 1300  
Duvall, WA 98019