



How Water Works:

How We Move Water Most water systems are designed to utilize gravity to efficiently move water throughout the water distribution system. When the use of gravity cannot be utilized, pumps take over to move water.

PRESSURE ZONES: Because our water service areas are not flat most water systems have multiple water pressure zones. A water pressure zone is a geographic section of a water distribution network that is determined by the elevation of the area served.

The pressure in the water system, known as hydraulic pressure, is created by gravity pulling a column of water downwards. At an average height of about 120 feet, water towers properly pressurize the water distribution pipes within a pressure zone.

Within a pressure zone, a minimum pressure is established by pumping stations or reservoirs. Water does not flow between pressure zones unless it flows from a higher pressure zone to a lower pressure zone, through a pressure reducing valve. Water pressure in a pressure zone typically ranges from 40 to 130 PSI (pounds per square inch), but may be higher. When the use of gravity cannot be utilized, pumps take over to move the water.



PUMPING STATIONS: The energy required to pump water is an extremely demanding component of water distribution systems. Since electrical power for pumping is a major expense, the goal is to develop a system which minimizes pumping.

Pump stations fall into two different categories. The first type lifts water from lower elevations to fill water reservoirs located at various high points. From there gravity takes over to supply customers at the lower elevations. For other areas where customers cannot be served by gravity, another option exists, the booster pump. These stations pump water to customers and help ensure adequate pressures are maintained at all times.

CRWP members have numerous pumps and pump stations in various locations throughout their service areas. Distribution system operators don't use all of the pumps in the system at the same time; rather they cycle them on and off based on the demand. Some pump stations will always have pumps running, i.e. booster pumps, while others may only be needed in the height of the summer water-use season. Many of our systems have pumps that automatically increase and decrease pumping capacity with shifts in water demand helping us save money on electrical costs.

Winter 2017 News

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Did You Know?

- In Clackamas County, public drinking water remains relatively inexpensive, delivered to you at under a penny per gallon.
- It is a federal offence to tamper with public drinking water tanks, towers, and reservoirs.
- Whether inside or outside your home, a leak can waste hundreds of gallons of water per year.

Winter Water Tips

When water freezes, it expands about 9%. So if the temperature of your pipes drop below 32 degrees, even for a short period, you're more likely to have a pipe fracture or worse. Here are some precautionary measures you can take now to help avoid the expense and inconvenience of frozen water pipes later.

1. Close Crawl Spaces and Vents

Anywhere cold air blows on a pipe, it creates the potential for freezing. To make sure your pipes are protected from the cold close crawl space vents and stuff insulation over the openings. Even a tiny hole can let in a lot of cold.

2. Protect outside pipes and faucets.

In some homes, the outside faucets and hose bibs have a separate shut-off, if this is the case shut off the outside water. Then go outside, disconnect the garden hose and if the outside water



has been shut off, turn on the faucets to drain water from the line. Leaving the faucets in the open position, wrap or cover all outside faucets and hose bibs to protect them from the cold.

Open the cupboard doors beneath your sinks.

Opening the cupboard doors beneath your sinks will allow warm air to circulate around the pipes and will help keep them from freezing. If you're anticipating a deep freeze, consider using a fan to help circulate the air near the pipes, or purchase a

small space heater for some extra temporary heat.

3. Allow water to trickle from your faucets. In extreme or longterm cold spell, allow the water to trickle from your inside faucets to prevent freezing. Over a 24-hour period this will cost less than 15 cents per faucet.

4. Never turn off the heat when you leave home. During the winter set the temperature to at least 55-60 degrees F, and if you have multiple heat zones, be sure to adjust all thermostats appropriately.

5. Have emergency telephone numbers handy. Despite all best precautions water pipes may still freeze. Keep the number to your local water provider and your plumber posted in a location where everyone can see it in case of an emergency.

CRWP Interactive Watershed Map

The Clackamas River Water Providers have developed an Interactive Watershed Map, a new educational tool for learning more about the Clackamas River Watershed.

The map highlights different points of interest within the watershed such as all of the drinking water treatment plants, PGE dams and reservoirs, parks and land use throughout the watershed. By clicking on the different icons our customers can learn more about what is going on in our Clackamas River Watershed every day.

Click the link below the map to visit the new Interactive Watershed Map.



www.clackamasproviders.org/interactive-watershed-map/

Know the Location of Your Main Water Shut-off Valve

Where is your Main Water Shut-Off Valve?

Everyone in your household should know the location of your main water shut-off valve. This controls all of the water coming into your house and in case of an emergency this valve will enable you to quickly shut off the water at its source. Fast action could prevent costly damage caused by flooding if a pipe is ruptured.

The shut-off valve will be in close proximity to where the water service line enters the home. After finding the valve, turn it to make sure it isn't stuck or frozen. If it is stuck, have a plumber repair it so that it will be in good working order

should you ever need it.

Show everyone in the home where the shut off valve is and how it works. Tie a piece of yarn or ribbon on it so it is easy to locate during an emergency. If you have to shut your water off at the meter, it's

advised you contact your water provider for assistance, you may be liable for damages to the meter or shut off valves.



Winter Indoor Water Conservation

You might think of water conservation as a concern most relevant during the summer when you water lawns, fill swimming pools, wash cars or irrigate vegetable gardens. But while it's true your water usage may spike during warmer months, everyday activities like flushing toilets, shaving, and washing clothes, dishes and even your hands account for a lot of the water an average household uses throughout the year.

KITCHEN

- When washing dishes by hand, don't let the water run. Fill one sink with wash water and the other with fresh rinse water.
- Run your dishwasher only when it's full.
- For cold drinks, keep a pitcher of water in the refrigerator instead of running the tap.
- Use the garbage disposal sparingly. Instead, use your fruit and vegetable scraps to create compost.

BATHROOM

- Keep a bucket in the shower to catch cold water before it warms up. Use this water to flush toilets or water plants.
- Turn off the water while you shave or brush your teeth.
- Time your shower to keep it under 5 minutes.
- Put leak detection tablets in your toilet tank. If the color seeps into the toilet bowl without flushing, you have a leak. Contact the CRWP for free detection tablets.

LAUNDRY ROOM

- When you shop for a new clothes washer, consider *Energy Star* certified washers and receive a CRWP rebate of \$75.
- When doing laundry, match the water level to the size of the load.
- Insulate hot water pipes so you don't have to run as much water to get hot water to the faucet.

Visit our website at www.clackamasproviders.org for more water saving tips and information on water rebates of up to \$485 a year.

Winter Quiz:

Answers - Can be found on page 4.

1. Public drinking water in Clackamas County cost about how much per gallon?

- A. Roughly 2 dollars
- B. Five cents
- C. Less than a penny
- D. One dollar

2. What is the most inexpensive way we move water through the distribution system?

- A. Electrical Pumps
- B. Pumps powered by natural gas
- C. Water pressure from gravity
- D. Solar pumps

3. Most recently the CRWP developed an _____, a new educational tool for learning about the Clackamas River Watershed.

- A. Short Watershed Video
- B. Informational Brochure
- C. Youth Activity Booklet
- D. Interactive Watershed Map

4. As mentioned in the article, where is the main water shut-off valve to your home located?

- A. On the water line near the sidewalk
- B. At the outside hose bib
- C. Where the water service line enters the home
- D. Underneath the kitchen sink

Find a Sign Near You!

In 2014 the CRWP received a State Revolving Fund Drinking Water Protection Grant to install attractive interpretative signage at parks and boat ramps in the lower Clackamas River to help educate our river users on how their actions can impact water quality and what they can do to protect our drinking water source.



Due to the diverse ownership of parks and boat access points in the Clackamas River watershed the CRWP had to work with Oregon City Parks, Clackamas County Parks, Clackamas River Water (District), Oregon State Parks, and PGE on this project. Through this grant signs were produced and installed at Riverside Park, Carver Park, Barton Park, and Milo McIver State Park in the lower river. Smaller versions of the signs were installed by PGE at Timber Park,

Promontory Park and along new river access point higher up in the watershed.

In addition to sign installation, the CRWP also produced an outreach brochure and participated in two events (The Clackamas Whitewater Festival and PGE's Promontory Park Marina Grand Opening) during the spring of 2016. This provided information to our recreation community regarding river use and drinking water, along with enrolling more people in the Oregon Clean Boater Program to protect water quality.

The CRWP also worked with PGE and the Oregon State Marine Board to get PGE's newly revamped Promontory Park Marina certified under the Oregon Clean Marina Program. Certification was finalized in July of 2016 and acknowledgment of this accomplishment is listed on the Oregon State Marine Board website.

By preserving the Clackamas River as a high quality drinking water source we can help minimize future drinking water treatment costs, while being good stewards of the river. To learn more about how you can paddle, fish, and play in the Clackamas while protecting our drinking water source click <http://www.clackamasproviders.org/wp-content/uploads/2014/05/Interp-Brochure-FF.pdf>.

Pesticide Pledge Program

The CRWP continues to work with a number of our basin partners on pesticide reduction efforts. Please see what we are working on below.

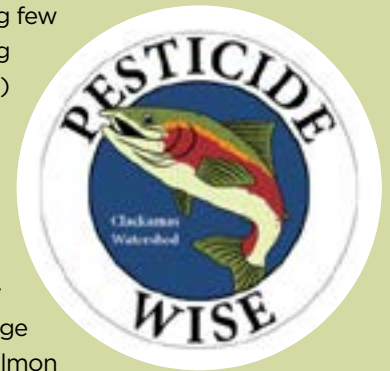
Parting with Pesticides Pledge Program

Because low levels of pesticides continue to be found in water samples collected from the Clackamas River and its tributaries, the Clackamas River Water Providers are working with the Clackamas River Basin Council, to implement a *Parting with Pesticides* Pledge Program. Homeowners and residents within the Clackamas Watershed who care about protecting water quality for people, fish, wildlife, drinking water and pets can help prevent more pesticides from reaching the river

by making a declaration to reduce or eliminate the use of pesticides on their yard and property.

Participants who are using few to no pesticides (including herbicides and fungicides) can sign the pledge and display a beautiful, yard sign to highlight the important steps they are taking to promote and enhance the health of our watershed. Take the Pledge today and display your salmon proudly. For more information go to:

www.clackamasproviders.org/pesticide-reduction-efforts/



Winter Quiz:

Answers

Question 1 - Answer is C
Question 2 - Answer is C

Question 3 - Answer is D
Question 4 - Answer is C

Faces of Drinking Water

An Interview with
Todd Knapp, Oak Lodge Water Services

There are many dedicated professionals behind the scenes that insure the delivery of safe clean drinking water to our homes, businesses and schools 24/7, 365 days a year. Rarely do these professionals talk about what their individual roles are and how their role plays in the process of delivering public drinking water. We recently interviewed **Todd Knapp**, the Superintendent at *Oak Lodge Water Services*.

How long have you been working in the drinking water industry? My first day at work was June 7th 1983 that same day after work I went home cleaned up, put on my cap and gown and went to my high school graduation. I started out as a utility worker one. That was 33 years ago, now I am the superintendent.

What is your background prior to working in drinking water? I grew up in the concrete business working for my dad at Knapp Construction, family-owned since the 1940's.

Do you have anything that you would say is the favorite part of your job? One of my favorite parts is the ability to plan for new projects and seeing them be constructed to make the distribution system better. Using the GIS mapping system for planning, locating and identifying hydrants, dead end pipes, meters, valves and whatever the field crew needs to know about the system in general.

Do you plan on retiring here at Oak Lodge? Yes, I really hope to, I have about 6 years to go.

What accomplishments are you most proud of in your career? Advocating for the installation of the districts own separate master meters. Before they were put in, Oak Lodge was responsible for all leaks and usage on several thousand feet of water main, we went from about 18% unaccounted for water to about 8 or 9%. I'm also real proud of Building our GIS program from scratch.

What advice would you give to someone starting out in this field? Work very hard! Be engaged! Show initiative, always have

a positive attitude, keep busy and never "just stand around" always ask yourself "what can I do?". If you do this, it will only be a matter of time before you get moved ahead.

How has the industry changed since you started? There has been a fair amount of increase in regulations since I started, such as complying with confined space entry rules (all for the good, of course), dechlorinating water while flushing hydrants, the introduction of CDF (Control Density Fill). Technology over all has made life safer and more productive for the field crew. Having better tools, fittings, and equipment has certainly made a big difference.

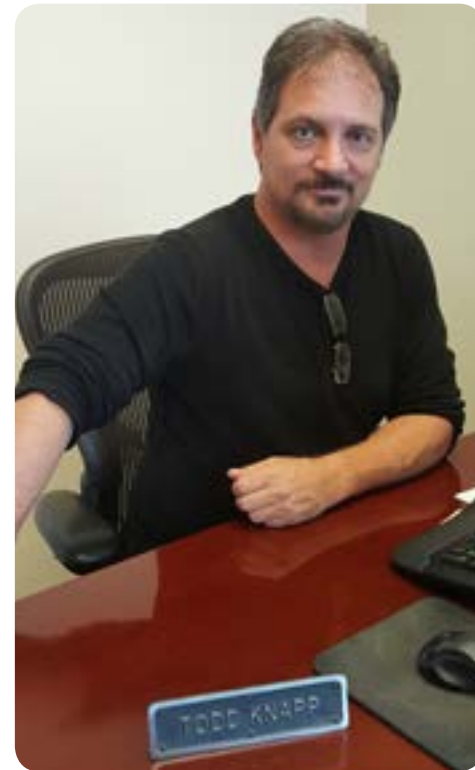
What do you feel is most important about your job? Protecting public health, by providing safe, high quality drinking water to the public and making sure our field crews are safe while at work.

What would you like the public to know about their drinking water? Our Water doesn't come from Portland or Milwaukie. Our water comes from the Clackamas River. The water is treated at the North Clackamas County Water Commission treatment plant, it then travels in a distribution network of over 100 miles of pipe, then finally to our customers' homes.

What can the public do to help make your job easier? Slow down when they see our crew working on the side of the road. Be understanding and patient when we're repairing broken water lines that provide water to their homes.

What's the most significant project you have been involved in during your career? The most significant projects are the construction of our 5-million-gallon reservoir at Valley View, and our 2.8-million-gallon reservoir at View acres. Having all this storage will help Oak Lodge in the event of an emergency. We recently upgraded our View Acres reservoir site to meet code for seismic earthquakes and are currently in the construction phase to do the same at our Valley View Site.

What's the one thing you can't live without at work? Great staff like the ones I have, cell phones, computers, and properly maintained equipment such as dump trucks, backhoes, and other tools.



What would you say H2O is to you? Life giving, our bodies can't do without it, a great tool used to do a lot of different jobs such as cleaning and myriad of other things.

What do you do for fun when you're not working? Metal detecting has become my hobby, I've found coins and a lot of buried junk. I've only had my metal detector for about a month before the rainy weather started. I have four grandkids as well, my wife and I like to go camping with the grandkids. Last summer we took them to Kah-Nee-Ta and they had a blast.

Looking back did you ever see yourself going a different direction other than the water industry? I explored many options such as becoming a commercial diver, a police officer and working on an off-shore oil drilling rig. I always came back to working in water, I'm glad I did.

The CRWP would like to thank Todd for giving us a bit of time out of his busy schedule for this interview.

Thank you, Todd!

Education and Research Assistance

The CRWP continues to work with Clackamas Community College and Portland State University to provide internship opportunities for students to support CRWP related projects.



Shania Rice

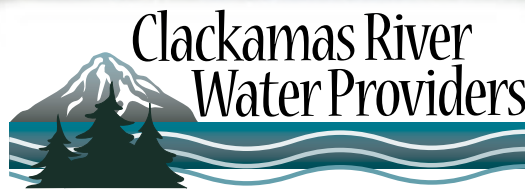
Our newest intern from Clackamas Community College worked on creating this 2017 Winter E-newsletter. Here are a few words from her.

“Hello, My name is Shania Rice. I am a ‘soon to be’ gradate from the *Water & Environmental Technology Program* at Clackamas Community College. I have been fascinated by water ever since I was young.

Continuing my education in the Water Program at CCC seemed to be the right step for my future.

After filling my brain with the knowledge of how water is treated, how pathogenic organisms are found, and much more, I was presented with the opportunity to learn the other side of water. This is the public outreach and water conservation side I discovered at CRWP.

As a home owner, I have learned new ways to test for leaky pipes, faucets, and toilets, of which I have found in my own home already. As a student I have learned the importance of the Clackamas River watershed and understand how important it is to have a public outreach program. As a citizen, I have learned that I take water for granted. My experience at CRWP has helped me open my thinking even more. *Shania*



Working together to protect and conserve our drinking water.

14275 S Clackamas River Drive
Oregon City, OR 97045
www.clackamasproviders.org

Our Members:



www.crwater.com



www.cityofestacada.org



www.ci.gladstone.or.us



www.ci.oswego.or.us



www.oaklodgewater.org



www.sfwb.org



www.sunrisewater.com



www.tigard-or.gov

Christine Hollenbeck Public Education and Conservation Program Coordinator (503) 723-3511 christine@clackamasproviders.org
Kim Swan Water Resource Manager (503) 723-3510 kims@clackamasproviders.org