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Fall 2014
Vol. 36, No. 4

A publication of Oregon Association of Water Utilities

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Your photos and articles for inclusion in H₂Oregon. OAWU requests your best photos of Oregon water scenery for our magazine covers and artwork!

Please mail your photo to our office. If we use your photo on the cover you will receive an official OAWU shirt and hat.

We are also seeking articles, clean jokes, Oregon trivia, letters to the editor and interesting stories. Please send submissions (no more than two pages in length) to:

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Cover Photo: Drift Creek Falls
Photo by Jason Green

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Send your articles with full color photographs, in digital format if possible, to the address listed above.

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OAWU's mission is to provide service, support and solutions for Oregon water & wastewater utilities to meet the challenges of today & tomorrow.

System Maintenance

by Jeff Crowther, Wastewater Technician



It has been a while since I have really addressed my own system maintenance, but with prodding from my Board of Directors (which is my wife and children) I scheduled a doctor's appointment for the dreaded physical. I know that it is good to evaluate your current condition as you age to protect yourself from stress and system neglect. We assume everything is good, but there is always room for improvement. To put it simply I was told to cut down on the bad fats, oils and grease or FOG as we in the business refer to it.

If you think about it, the way we treat a sewer collection system is very similar. We tend to ignore the collection system until there are problems. The problem could be collection of fats, oils and grease (FOG) in a wet-well that causes the pumps or pump controls to fail. It may even be more serious and cause a sewer mainline blockage which can result in a backup or even a spill. These situations result in a cost to the agency in added staff time, paperwork, or bad publicity. Our goal should be to reduce the introduction of FOG into our public collection system to ensure these situations don't occur.

The best way to prevent problems with our collection system is at the source. Personally, I have been directed to reduce my intake of donuts and fast food. It should be noted that I will be reducing my FOG intake, not eliminating it. As I age, food is one of the few joys left in life.

For our publicly owned sewer system we should also reduce the FOG as much as possible. The best way to accomplish this is also at the source. Agencies should have the following in place:

- A Sewer Use Ordinance that gives the agency the authority to inspect and

implement BMPs to control FOG discharges. The ordinance should also have the ability to require grease removal devices to be installed if the BMPs do not work and FOG discharge inhibits flows down-stream.

- During new construction work with the local planning department and county/state plumbing officials to ensure that an appropriate grease collection equipment is installed, to protect the agency's sewer system.
- The Ordinance should also provide for cost recovery for damages and cleaning of the sewer caused by a specific discharger. Cost recovery may be difficult if the damages cannot be traced back to a specific source.
- If possible have a business license program implemented. This will help identify potential sources of FOG. Don't forget that it is not only restaurants that may have issues. You should also look at schools, retirement homes, and coffee shops; to mention a few.
- Have a program to assist business owners in monitoring the pumpers when cleaning their traps and interceptors. Make sure that the business owner is getting what he paid for. The units should be cleaned and inspected, noting any repairs that may be required.
- No matter how large or small your agency, the key element in reducing FOG in the sewer system is inspection and education.

It is best to have an ongoing maintenance and inspection program that can identify problem areas so corrective action can be taken prior to a late night sewer overflow. This may include measures such as cleaning a residential line with a belly regularly, until permanent corrective action can be taken.

Whether it is in our own private system or the public system, the reduction of FOG is the beginning of a long and happy life. By reducing the FOG we can add to the longevity of the system with reduced costs and maintenance. ♦



OAWU's Summer Classic 2014

The weather for this year was fantastic and the activities were great. Monday's pre-conference provided a few extra CEUs to those who attended. The conference was kicked off by an opening session given by OAWU's Executive Director, Jason Green, and a legislative update by Mark Landauer. Tuesday held the evening outdoor barbecue with a meet and greet social, exhibitor prize give-away, followed by a bonfire on the beach. Wednesday continued with a full day of classes; some took the afternoon off to participate in the annual Golf scramble at Gearhart Links. Thursday concluded the conference at noon with final words from OAWU's Program Manager, Scott Berry, and the highly anticipated raffle drawings and cash prizes.

Thank you to this year's Bronze sponsors RH2 Engineering Inc., EJ, BergerABAM, and CoBank.

Thanks also for the bonfire beverages sponsored, again this year, by Ferguson Waterworks.

Annual golf scramble at Gearhart Links which hosted 11 teams

Thursday, during closing session, OAWU gave away over \$600 in merchandise, \$300 in gift cards, and \$200 in cash prizes.

This year's OAWU raffle for a 47" flat screen TV was won by Todd Latchaw from Nelson Environmental Inc.

This year's OAWU Water PAC raffle for a Remington 870, 12 gauge shotgun with turkey choke was won by Rory Martin from Oak Lodge Water District.

The Lollipop board prize for a full registration to the OAWU Sunriver Conference in March 2015 was won by Robert Whalen from the City of Heppner.

Mark your calendars for next year's Summer Classic in Seaside, Oregon August 17-20, 2015. See you there! ♦





OAWU's Annual Golf Scramble

Seaside, Oregon – Gearhart Links Golf Course – August 20, 2014

The sun was out the entire day, the greens started off slow then turned fast (just to keep you guessing); it was a perfect day to hit the links for this year's scramble. The staff at the Gearhart Links Golf Course was accommodating, friendly, and professional helping to make the day even more enjoyable.

Eleven teams of four challenged the course this year, making a good solid competition. No one was safe from the errant drive, misjudged chip shot, or the mocking one received when their shot landed two fairways over; we must also admit that there are many great players and were many awesome shots on the course this year. The day was very pleasant and the banter helped build camaraderie throughout the scramble.

Special thanks to this year's sponsors: The Ford Meter Box, Ferguson Waterworks, EJ, HD Fowler, and Lakeside Industries for their support of the attendees and association.

The three winning teams were:

Tied for 1st place: Scott Motsinger, Don Miller, Jake Dyer, and Ron Watts

Tied for 1st place: Dave Bobbett, Simon Cartwright, Dan Wilson, and Wayne Bush

3rd place: Bob Ulrich, Rick Fuqua, Stuart Trebelhorn, Jim Pronovost

The winners of the golfing competition games were:

Longest Putt #1 – Pat Dunigan

Longest Putt #2 – Ron Watts

KP #1 – Dave Seifert

KP #2 – Mark Moore

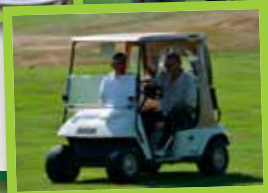
KP #3 – Ron Watts

Longest Drive #1 – Ed Pettett

Longest Drive #2 – Dan Wilson

Special thanks go out to Tim Tice (Projects Manager), Hans Schroeder (Circuit Rider), and Mike Collier (Training Specialist), who helped make sure the scramble went off without a hitch. ♦

Mark your calendars for OAWU's next Summer Classic at Seaside August 17–20, 2015. It is a great location to enjoy while you earn CEUs and network with associate members and your peers.



The Jeff Swanson Memorial Scholarship

College students encouraged to apply now

Is your child attending college next year? One or more scholarships will be awarded from \$500 to \$1500 for the 2015-2016 academic school year. Employees from OAWU Regular Member systems, in good standing, are encouraged to have their college bound child submit an application by the Friday, December 4, 2014 deadline. Download an application at www.oawu.net and mail it to:

OAWU Scholarship Committee
Attn: Scholarship 2015
935 N. Main Street
Independence, OR 97351

OAWU will award the scholarship/s at the 37th Annual Management & Technical Conference, March 2015 in Sunriver.

Jeff's Story

Jeff Swanson passed away on July 4, 2009, from esophageal cancer. Mr. Swanson was an accomplished and passionate Circuit Rider and Programs Manager for ten years at OAWU. He was a great water operator, manager, troubleshooter, treatment plant operator, instructor and a great friend. Jeff had a warm and memorable personality, exceptional integrity,



personal character and work ethic. It is to Jeff Swanson's memory that this scholarship is named, he believed that obtaining education was paramount to a person's success and encouraged its pursuit. As Jeff would often say regarding one's attitude and actions, "Choose to make it a great day!" ♦

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“Witching” or “Wishing?”

by Scott Berry, Circuit Rider/Program Manager

When I was very new to the water industry, I was introduced to the phenomenon known as water witching. This practice was purported to show where the underground water pipes are located. It looked interesting and the guy showing me how to do it said he was sure it worked. However, he was not sure enough to show me where the pipe was and then turn me loose on the backhoe, without first doing a lot of slow hand-digging; as is prudent in any underground excavation. I remained skeptical and over the years I kept asking those in the industry about this practice and started doing some research on my own.

Whether you call it Witching, Dowsing, Rhabdomancy, or Divination, it's all the same practice. Some say it has roots in the Bible and that Moses was the first practitioner (Numbers 20 9:11) or that it originated in 1540 in the publication *De re Metallica* by Georgius Agricola. The questionable nature of the phenomenon has drawn suspicion since the beginning. There has always been a struggle between skeptics and believers, neither group being able to persuade the other by reasoning or experiments. Numerous times, dowsing has been tested scientifically without producing any significant positive results.

Over the centuries, there have been many theories as to how it works. Everything from E-Rays (from the German word *Erdestrahlen*, meaning earth-rays) that are believed to originate within the earth and penetrate the crust to form an invisible latticework of lines. Local circumstances such as underground streams, minerals, and geographical formations, also are said to cause fields that radiate from the ground. These fields are believed by some to affect health, animal behavior, human “auras”, plant growth, and many other things. The believers will emphatically tell you that these fields can be easily

detected with the use of a dowsing rod. Skeptics will tell you that there is no scientific basis to support the existence of these fields and that they can only be demonstrated by the use of a dowsing rod. Dowsers fancy a notion that they call ‘polarity’. All E-rays and other obscure energy fields have this polarity, either positive or negative. The meaning of polarity differs depending on which dowser is asked; some say it refers to the effects the fields have on humans, others say it refers to electrical polarity.

Man's capacity for self-delusion is infinite.
—Dr. Elie A. Shneour, Biosystems
Research Institute

In the multitudes of studies that have been done on this topic over the past five centuries, it has been proven that the “positive” results of dowsing are attributable to three key factors:

The Ideomotoric Effect Take a paper clip and tie a 12-16 inch thread to it. Rest your elbow on the table, hold the loose end of the thread with your fingers and let the paper clip swing like a pendulum right above the table. Hold still and try not to move your arm at all. Now visualize that the paper clip moves back and forth but do not move your arm. Does the pendulum swing? If not, concentrate harder because it will eventually move. Ideomotoric Effect is a subconscious movement governed indirectly by your expectations rather than conscious muscle activity. In the case of dowsing rods, a very small movement away from equilibrium causes great fluctuations in the rods. Rods do not move by themselves!

Instability and External Attribution Bias As in the case of L- or Y-shaped rods, the instability of the instrument itself enhances the instrument's credibility. An unstable system is very difficult



to keep in equilibrium and deviations must be compensated for at all times. This unpredictability causes the dowser to believe that he has no control over the rod's movements, which, so far, is correct. It is when the dowser interprets the cause of the movements to be of exterior origin that an illogical conclusion is drawn. Note that nothing is stated about whether the dowser is actually right or wrong, but an illogical conclusion is no more than a conclusion based on a questionable assumption, which, of course, might be true. What's psychologically interesting is the proneness to think that 'if I am not controlling the moving instrument resting in my hands, then something else must be!' This tendency to attribute a self-caused effect to external sources, is called external attribution.

Expectations and Suggestive Environments

The influence of expectations on the subconscious and random activities of the system can cause, just about, any effect. A suggestive environment, for example, supportive and enthusiastic onlookers, makes the positive outcome all the more probable regardless of contingent physical effects involved. After spending some time in the industry and installing many miles of

pipeline, excavating for leaks and service installations, I began to get "better" at witching. The reason for this is that I subconsciously put myself in the shoes of the original pipeline installer and based on my surroundings (i.e. the location of ditches, property lines, roads, curbs, trees, rights of way, etc.) I subconsciously decided where I would have placed the pipeline and sure enough... that's where the witching sticks said it was. The primary task of the experimenter is, in the case of dowsing, to try to eliminate the test result dependence on the subject's expectations, a principle not commonly practiced among dowsers. Why would they try to falsify their own hypotheses when they're already convinced that dowsing works? The answer to this simple question essentially differentiates science from pseudoscience. I believe

that rigorous testing is happily abstained from for several reasons: ignorance, lack of knowledge, fright of disconfirming results, and the will to believe. These aspects not only make the mind susceptible to belief, they can also unjustly rule out the validity of scientific test results. If a test gives a negative or unexpected result, the test itself is concluded to be erroneous.

I fully expect to be engaged in debate about this article as I'm out in the field visiting with you all. In the spirit of "letting sleeping dogs lie," I'll concede that some have a better than average percentage with dowsing rods, though I still believe that it's only because some have a better than average understanding of how their system is laid out. ♦

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Is it a Croc... or a Gator?

by Jack Hills, Source Water Specialist

I get as much, or more, enjoyment reading our H2Oregon articles as anyone. There is much to learn, stories to enjoy, philosophies and personalities to hear about. What happens when we send TEAM OAWU from the Pacific Northwest to someplace east of the Mississippi? Your connection to the National Rural Water Association is through membership with OAWU as the state associate for Oregon. I suppose that the In-Service Conference and the Annual Convention are mostly held toward the east coast to easily accommodate the greater population of rural water and wastewater systems on the other side of the country. This past June the NRWA In-Service was held in Mobile, AL. The Source Water Specialists of Alabama Rural Water arranged for the national group of Source Water Specialists to visit some interesting sites and see some of their local projects to protect drinking water.

Since I wrote a brief article three years ago on recycling wastewater, I thought it would be interesting to tell you about the current research project we visited across the bay from Mobile, in Daphne, AL. Daphne Utilities has coordinated with a company that is studying and developing prototypes of wastewater treatment technology that may change how some wastewater plants treat their effluent, given the right conditions and accommodations available to them. Algae Systems (algaeystems.com) has developed methods of using the nitrogen and phosphorus-rich wastewater effluent that can cause aquatic problems of Eutrophication, oxygen depletion, by

harvesting the algae grown in it to be converted to fuel, fertilizer, gaseous oxygen and clean freshwater.

Briefly, the wastewater effluent is purified by using algae and sunlight, without chemicals or filters. The algae and wastewater are piped out to floating clear plastic containers (huge baggies) on the coastal body of water (Mobile Bay). This project had about an acre of these containers (Corps of Engineers' approved) anchored in a grid, designed for further expansion. Being mixed by the gentle wave action of the bay, fertilized by the nitrogen and the phosphorus, the algae grows at an accelerated rate, consuming the contaminants and releasing the energy stored in the waste. At the end of the process the algae is rendered into fuel and water that is almost clean enough to drink.

All the procedures were controlled and monitored by high technology equipment, providing data for the inputs and output. However, one process still had to rely on human, "hands on," labor; maintenance of the baggies. Laborers had to wade out along the containers to keep them clean from debris and keep the large, local reptiles from getting on the bags and sunning themselves. Now is when this Pacific Northwesterner stays out of the water and covets his Cascade Mountains! Amazingly, they said the gators really don't bother the folks wading and cleaning off the containers.

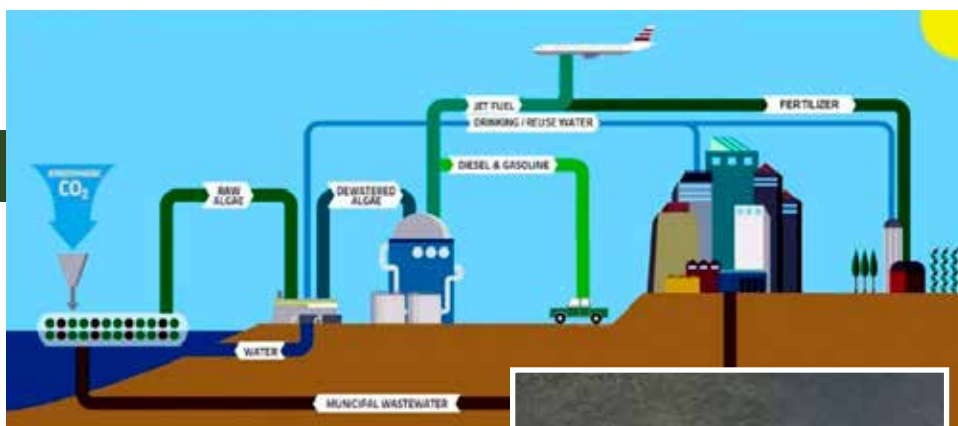
This is a brief look at some new ideas being used to process and make use of our waste and further protect our

resources. Take a look at the Algae Systems website (www.algaesystems.com) for a more complete review of their work. Maybe it's not too practical for us without a coastal bay, but they are very excited about its potential when they consider the expanding "dead zones" such as experienced in the Gulf of Mexico where the majority of the wastewater effluent from the entire Mississippi watershed is emitted as an effective point source contaminate. Impressive implications!

By the way, you should be aware that the next NRWA Conference is right here in our own backyard in Seattle,

WA. Check out the NWRA website for the October 6–8 Water Pro 2014: www.waterproconference.org. Also, the next NRWA In-Service Convention is in Reno, NV next June.

We get to stay on the west coast for a year. Call us if you need any assistance with your water/wastewater system or for source water protection. 💧



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What Did You Say?

by Mike Collier, Training Specialist/Operations

Recently, I have had issues with communication at a water system. The system uses a radio to transmit the tank water depth information to the controller to tell the pumps to either turn on or off. This communication got blocked and confused so the depth readings were not going through and the computer decided that this meant that the pumps should run. As it turns out when you run pumps non-stop, the tank overflows.

What does an overflowing tank look like in our own lives, are there times when our communication has either been blocked or confused? How can we get better at communicating?

There have been many times throughout my life when people have misinterpreted what I was telling them, or when I didn't fully grasp what someone was trying to tell me. Usually this ends poorly; at work this could mean that a task was completed subpar, or that something that did not need to be done was done by accident, wasting time and money. At home this could mean an argument that did not need to happen between spouses or between parents and children.

Some tricks to proper communication include: listen, ask questions, and repeat.

Let us first review what listening is: it involves more than just hearing what the other person is saying. It also involves paying attention to what their body language is telling you. This can be partially deciphered to help you with interpreting what their mouth is saying and what their real meaning is. This is done through eye contact and watching for physical cues, an example of a physical cue is crossed arms. This usually means that the person is not willing to listen to what you have to say as this is a

protective or defensive stance. This is an important part of communication.

People can express themselves through different techniques. The worst of these methods to communicate is through writing, such as e-mail. The reader has to look for subtle nuances in the English language to try and get the correct meaning from the e-mail. The second worst is by phone, with a phone you can hear the inflections in a person's voice to help you to interpret what is being said, but you don't have the visual cues. The very best form is in person, when you are with the speaker you have direct access to their body language, can hear their voice and can make sure that you are fully getting the meaning from the conversation; interpreting feelings that might have been hidden to us if we just had the words alone.

Next, let us look at asking questions. This is one way to check on the parts of the conversation that seem confusing, or parts we aren't sure of, or just something we want to confirm as an important part of the conversation. It can be easy to make assumptions about what someone is telling us based on what we think, but it is much better to ask and confirm what is being said, as everyone has different ideas and interpretations. Often people don't want to complete this step. Some people are scared to let others know that they aren't quite sure what someone is telling them. Especially, if it is a boss telling one how to do a task, sometimes it can be difficult to say that we don't understand, but if we do ask we will save ourselves and our company much time and anguish, stopping the task from being done incorrectly. It is much more important to ask the few questions or ask for them to say it in

a different way so that everyone is sure to be on the same page.

The final step is to repeat what we heard and understand from the conversation. This is where we take what we have heard, seen, asked questions about and further interpreted in the conversation to see if our interpretation is agreeable to the person that was talking with to us. If it is, then great, hopefully communication has successfully taken place. If not, then this gives them a time to try to restate what they are trying to convey and the process starts over again until conversation is successful.

The single biggest problem in communication is the illusion that it has taken place.

—George Bernard Shaw

I hope we can all practice the steps to proper communication and become better communicators. ♦



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Tracer Wire

by Heath Cokeley, Circuit Rider

I realize that the title of this article is not a fun and exciting topic, but I believe it is an important topic to cover none-the-less. How many of you install tracer wire when installing nonmetallic pipe? My hope is all of you. Many of us have seen, firsthand, the downside of not having tracer wire to locate the mainline years after the ditches have disappeared.

I think it is important to note that there are technologies available to locate pipe that does not have a metallic element to it or have one installed with it. These technologies include Ground Penetrating Radar (GPR) units, what I refer to as “Thumpers” (a device that puts a small water pressure wave on your pipe so it can be located with a listening device and, most recently, the Subsurface All Materials Locator (AML). All of these devices have their benefits and downfalls which, in my opinion having used all of these, is as follows:

The GPR units look like a lawn mower with a display screen. The benefits include giving you a display of all things in the ground under the machine. The down fall is they can be temperamental in certain classes of soil, especially clay, and it is up to you to decipher between pipes if there are multiple utilities located in an area. For many systems the cost is another drawback as you are looking at \$20,000 plus, depending on how the unit is equipped.

The “Thumper”, as I referred to earlier, works well for locating short

distances of pipe, but requires a connection to the mainline within 250 feet. Many of us in the industry are not thrilled with the idea of putting a small water hammer on our old mainlines especially, Asbestos Cement pipes.

The third one I mentioned is the Subsurface AML unit, which resembles a dust pan. I demoed one several months ago and believe this unit has great potential, it appears to locate straight edges in the ground. This may, however, give some false positive readings since it is looking for any straight edge in the ground. At a cost of \$5,500 it is also out of reach for some utilities.

With these devices much of the equipment’s usefulness is based on the skill of the operator and, I will be the first to admit that, if I worked with these devices more frequently I believe I would become more accurate with them. That is as nicely as I can say that I was the reason for some inaccurate locates.

With all that said, I think the need to install some metallic method to locate our nonmetallic pipes is necessary, but I think the specifications for this need to be made on a system by system level. The State of Oregon mentions tracer wire briefly in OAR 333-061-0050 (8) (k), which roughly states that all nonmetallic pipe must be installed with at least 18 AWG solid copper wire that comes up in meter boxes of at valves and has an access point at least every thousand feet, as

well as, all joints and splices being water proof. Is this enough to cover all the bases? Honestly, I think it would be more appropriate for every system to evaluate their system specific needs and write a specification to cover them for the times when contractors are installing your facilities. For instance, I always required 12 AWG wire and looking back I wish I had gone into more detail. Having specific access points located outside the valve and meter boxes where a locating machine can be attached to prevent damage to the wire. Also, it would have been nice to have this standardized, so when you walked up to a

meter box you know where the tracer wire access points are located. Having special standards for the kind of wire used when boring a pipe as opposed to conventional excavation and where, in proximity to the pipe the wire will be located. All these variables will affect how effectively we can locate the line in the future.

Thankfully some of the Circuit Riders with Missouri Rural Water Association already did some of the leg work for this. What Joe Rubbelke, Jeff Dale, and Frank Stuemke developed is a tracer wire specification that I am hopeful utilities here in Oregon can

take and make into their own. They were nice enough to share it with me and allow me to pass it on to any system that would like to use it. If you would like an electronic copy of this tracer wire specification feel free to e-mail me at hcokeley@oawu.net or let me know you are interested the next time I am in your office or at your plant. The Tracer wire spec is about 5 pages long and, of course, you can just use it as a template to add to or delete from to make it work for your utility. With that I hope you found something useful to take away from this article and I'll see you down the road. ♦

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Fall is Approaching

by Hans Schroeder, Circuit Rider

In many areas of our beautiful state fall is upon us. With the onset of fall there are some preventative maintenance issues which are easily over looked. As the weather changes let's take a look at our to-do list for maintenance; here is a checklist of things that may make your spring and summer run smoother.

Vents on the reservoirs may need cleaned. This usually is a great place for birds to nest or bees to build their hives. This can cause problems, such as contaminants getting into the water and improper ventilation for the water to flow freely throughout the distribution lines.

Was the equipment serviced recently? The tires on the backhoe, grader and lawn mowers should be inspected for weather checking and pressure. Has the oil been changed and fluids checked in all the equipment? (Portable pumps should be drained for the winter so they don't freeze up. Are the portable pumps in proper working condition for this year?) If you are in charge of the parks; check the mowers, high wheel trimmers and weed eaters to make sure they are ready to go.

Another area easily over-looked are the catch basins or "bubblers" that may be at either side of an intersection. Through the fall and winter these can gather leaves, sticks and other debris; make sure they are clear and free flowing. Most of the time, if these were plugged, you probably would have received a call from a citizen or noticed that an intersection had turned into a duck pond. I actually have seen these "duck ponds" where someone has placed duck decoys in it as a joke.

This spring you should make sure to check all the streets for damage. The water, sewer, gas company or any other utility may have put lines in last year that will settle through the winter. Come spring

these may need dug out, re-compacted and a new asphalt patch applied. There could be some trenches that need top dressed from previous line installations that have settled as well.

Is your shop in order for a busy summer? Your shelves should be stocked with a few dresser couplers, repair bands, corp and curb stops, meter setters and other fittings needed for repair and replacement of pipes.

The Drinking Water Program (DWP) has changed their name to Oregon Health Authority (OHA). You should check with our local OHA or visit their web site and make sure you are up to date on your sampling schedule for the year. There are annual, 3 year, 6 year and 9 year dates that need to be kept in mind that may need to be taken this year. The samples that may be on a 3 year schedule are: Lead/Copper, SOC/VOC, Arsenic and HAA5-TTHM. Some 9 year samples are: Nitrite, RAD Gross Alpha and RAD Radium. Check on these annually at the States sampling schedule for your system. A good reminder is to print off the schedule from the DWP web site for your system, high- light the samples that need to be taken this year and post this information above your desk. Also, samples that need to be taken next year should be considered when approaching budget time. The cost of these samples can get quite expensive and need the attention of the Budget Committee.

I hope that some of these points may help you as we move through this fall and winter and into next spring and summer. Planning out the year and preparing for the projects at hand allows for a smooth, progressive spring and summer. The KEY is to always be prepared! ♦

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- Infrastructure Stability
- Operational Resiliency
- Community Sustainability & Economic Development
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- Stakeholder Understanding & Support

WORKSHOP ACTIVITIES

Overview of Key Management Areas
Utility 'Self Assessment' Exercise
Self Assessment Results Discussion
Improving Outcomes Based on Assessment
Practices, Tools, and Measures
Resources for Improvement
Action Plan Discussion and Exercise

Who should attend?

- Board of Directors
- City Council Members
- Mayors
- City Managers
- Water Operations Managers
- Waste Water Superintendent
- Finance Directors
- Public Works Directors
- Water/Wastewater workers





Silly Sudoku

by Tim Tice, Projects Manager

Never schedule a vacation prior to a deadline. No proofing is required for this article which will expedite the process of getting it into the magazine. Hopefully, some enjoyment can be had by those who like a

challenge. My procrastination has a two-fold lesson, never put anything off until tomorrow what can be done today and make the best of any situation.

The best of everything in life! ♦

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Is Green Asphalt Repair Even Possible,

by W.R. Bill Bailey, Lakeside Industries

No place in the nation has a higher forest density than the Pacific Northwest. It stands to reason that there are more forest roads here than anywhere in the nation. Maintaining those roads comes with a special responsibility. Certainly, budget is always an issue, but the bar is set even higher when it comes to the environment. Whether local and county agencies or forest and parks departments, reducing the environmental impact of maintaining asphalt roads is a must. And that's happening in the Northwest with the help of Lakeside Industries and EZ Street Bioblends cold asphalt.

With traditional asphalt products there are distinct environmental and safety challenges and they begin with one key ingredient: diesel fuel. Typically patching materials contain up to 30% #2 diesel as a diluent to keep the asphalt mixture

from setting up too quickly. In the wet climate and rain, the excess often leeches into the water table when thrown into a pothole. Contractors have also been fined for allowing diesel to be used on truck beds and paving equipment.

Adding diesel keeps the cold patching product workable. Using it to repair a road creates an obvious case of introducing a pollutant into the environment. Manufacturing it creates air pollution and a substantial carbon footprint and is a waste of good fuel material so direly needed today. Moreover, traditional cold asphalt products become hard and unworkable in the cold weather of the Northwest. A work crew repairing an asphalt road will typically use a hot box or a propane torch for heating the material to a workable state. The problem is acute: diesel's flashpoint is typically 148 °F, therefore using an open flame is a liability and the risk of overheating the product is high. Overheating makes

traditional cold asphalt hard and brittle, which leads to early failures.

Lakeside Industries has become one of the Northwest's largest asphalt paving contractors, serving Washington, Oregon and Idaho. They do so with a level of community engagement, environmental awareness and commitment to quality that is the hallmark of a legacy brand. They've won hundreds of awards for their performance—including numerous commendations for their commitment to the environment.

Teaming up to produce EZ Street Bioblends asphalt was a "no-brainer" for Lakeside. EZ Street asphalt is recognized as a leading cold product. Quick and efficient, EZ Street's guarantee of permanent pothole repairs and utility cuts make it a favorite among both work crews and the people who sign the checks in the Northwest.



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Bioblends is also thicker, which is better. On a Brookfield viscometer, diesel fuel blends of bitumen often measures around 300 centipoise. The bio-oil blends of bitumen in Bioblends measures between

800 and 900. In the simplest terms, we're talking the viscosity of whole milk vs. the viscosity of honey. Higher viscosity yields better asphalt oil film thickness, and thicker films of the same bitumen wears better. EZ Street Bioblends asphalt lasts longer with nearly a decade of actual use by British Columbia and Alberta and no complaints.

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As mentioned, Bioblends can be used warm or cold. However, it can also be put into a hot box or heated with a propane torch. Warming the product helps dry out

the hole into which it's placed. Warming also yields easier compaction, which is critical to proper repairs. And if any warmed product is left over, it lets the user do something no other product can: EZ Street Bioblends asphalt can be reheated and used later. Decades of listening to and learning from the "old guys" paid off.

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For more information, please contact W.R. Bill Bailey at 503-269-6206 or bill.bailey@lakesideindustries.com; www.ezstreetasphalt.com. ♠

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by Corbett Water District

The Corbett Water District supplies water to 1,080 customers AND produces 240 kilowatts of electricity each day with their own hydro generator. This energy production is saving the Corbett Water District an average of \$400 per month in electricity costs.

Generally when people think of “hydro power” they imagine a dam, like Bonneville, on the Columbia River and huge turbines that fill an entire building and produce 5 billion kWh of electricity per year. Well, instead imagine a small water district in east Multnomah County, Oregon with an annual budget of \$1,015,000 and five employees. This group includes District Manager, Jim Jans, who thought “why can’t a small domestic water system build a small hydro generator and generate some income to help cut the cost of providing water for their customers.” This district, like all water districts large and small, must meet all the requirements to provide safe drinking water at the best possible price. Costs to maintain a water system continue to increase from the price of fuel, maintenance and paying for necessary equipment. The idea of harnessing the water to provide a little income back to the District seemed like a win-win for the District and their customers.

Thinking outside the box District Manager, Jim Jans, went to the Water District Board in 2007 and received their approval to pursue the “hydro idea.” That was easy compared to the years of paperwork and permitting process, which proved quite challenging. The District received the approval for the project from the Federal Energy Regulatory Commission in 2013. David Jacob of Hydra Engineering handled the design of the generator for the project. This 15 horse power generator is two feet tall, sits on a concrete pad and produces 10 kilowatts an hour. The cost of the hydro project was \$60,000, but with energy tax credits and grants the district only paid about \$18,000. The Water District employees’ skills and ingenuity allowed them to complete much of the installation on their own. While Jans had worked on the design, the rest of the crew, Jeff Busto and Hans Rathjean, put their hands to cement work, fabricating, welding, plumbing and whatever was needed to get the generator online.

Now that the hydro generator is up and running it doesn’t require much maintenance other than reading the meter. The power generated is sold back to Portland General Electric where it is re-distributed to customers. The Oregon

Public Utility Commission reports that the extra kilowatts go into a power pool that PGE provides to families who can’t afford to pay their electric bills. The service is called “net metering.” The money Corbett Water District saves by eliminating an electric bill goes to offset the district’s other costs to maintain the water system.

The Corbett Water District hydro generator in Corbett is small and doesn’t have engines that roar like the big turbines at Bonneville, but it is able to harness energy that would have otherwise been wasted and save the District money in electricity costs.

Small micro hydro in other areas of the water system, such as distribution, may be in the future for the water district. The Corbett Water District will continue to look for ways to use the power of water to offset costs in the future. ♦

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Status of the Municipal WMCP Guidebook Update

Submitted by OWRD

Since the last status report in The Conservation Corner (April 2014), the Oregon Water Resources Department (OWRD) has made significant progress in its endeavor to update the OAR Chapter 690, Division 86 Municipal Water Management and Conservation Plan guidebook. A draft of the guidebook update is currently out for comment by a review team consisting of staff from the League of Oregon Cities, the Oregon Association of Water Utilities, and the Special Districts Association of Oregon, as well as representatives from the municipal water supplier community, water right consulting firms, and engineers working in the water industry. OWRD plans to finalize the guidebook update by the end of 2014.

Registrations of Reclaimed Municipal Water Use (Recycled Water)

Beginning in the mid-1970s, municipalities were faced with increased pressure to either stop discharging effluent into streams or to treat their effluent to produce a much higher quality for discharge. In response to these pressures, OWRD, the Oregon Department of Environmental Quality (DEQ), and municipal effluent dischargers joined together in 1991 to support passage of legislation [codified in ORS 537.131, 537.132 and 540.610(2)(h)]. These laws allow municipal effluent to be reused (or recycled) for irrigation or for other beneficial uses without a water right, provided that the effluent is treated and discharged under either a National Pollutant Discharge Elimination System (NPDES) or Water Pollution Control Facilities (WPCF) permit issued by DEQ. In addition, the treated municipal effluent may be retained in a pond or lagoon without a reservoir permit¹.

Furthermore, under ORS 537.132, the legislation directs any person using or intending to use the treated municipal effluent to file a Registration of Reclaimed Municipal

¹ Depending on the size of the retention structure, OWRD approval of the engineering plans may be required.

Water Use with OWRD. There is no fee associated with registering the use of reclaimed municipal water. The Registration of Reclaimed Municipal Water Use form may be accessed on OWRD's website at: <http://www.oregon.gov/owrd/pubs/docs/forms/reclaimform96.pdf>.

It is important to note that if the land upon which the treated effluent is to be applied has an appurtenant water right, filing this registration provides documentation to show that the reclaimed water was used in lieu of using water under the existing water right; thereby rebutting a presumption of forfeiture for non-use and protecting the water right².

Since the passage of this legislation in 1991, several municipal water suppliers have developed reuse/recycled water programs to land apply treated municipal effluent. These programs help reduce discharges and improve water quality while providing a source of water and nutrients for various crops.

Contacts:

Lisa Jaramillo, (503) 986-0880 or
Lisa.J.Jaramillo@wrdd.state.or.us

DEQ – Recycled Water Program: (503) 229-5472

OWRD – Reclaimed Municipal Water Use
Registrations: Mellony Hoskinson, (503) 986-0887 or
Mellony.D.Hoskinson@wrdd.state.or.us

² See ORS 540.610(1) and (2)(h): "...Whenever the owner of a perfected and developed water right ceases or fails to use all or part of the water appropriated for a period of five successive years, the failure to use shall establish a rebuttable presumption of forfeiture for all or part of the water right... Upon a showing of failure to use beneficially for five successive years, the appropriator has the burden of rebutting the presumption of forfeiture by showing...the nonuse occurred during a period of time within which the water right holder was using reclaimed water in lieu of using water under an existing water right."

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OREGON ASSOCIATION OF WATER UTILITIES 2014 TRAINING & EVENTS SCHEDULE

Date	Class Title	Location	CEU Information	ESAC#	Fee/Free
October 14	Control Valves	Grants Pass	0.7 Water/Wastewater	2286	FREE
October 22-23	Wastewater (WWT/WWC) Certification Review	Salem	1.4 Wastewater/0.6 Water	2295	Fee
November 3-5	Fall 2014 Water Training Short School	Cornelius	2.0 Water/Wastewater	2840	Fee
November 18	Submersible & Chemical Feed Pump O&M	Salem	0.6 Water/Wastewater	2841	Fee
November 19	Math for Operators	Salem	0.6 Water/Wastewater	2736	Fee
November 19	SDWA Update	Bend	0.4 Water	2287	FREE
November 20	Submersible & Chemical Feed Pump O&M	Florence	0.6 Water/Wastewater	2841	Fee
December 8	Effective Utility Management	Hood River	0.6 Water/Wastewater	TBA	FREE
December 8-11	16 th Annual End of Year Operator's Conference	Hood River	2.0 Water/Wastewater	2851	Fee

2015 TRAINING & EVENTS SCHEDULE

Date	Class Title	Location	CEU Information	ESAC#	Fee/Free
March 2	2015 Effective Utility Management	Sunriver	0.6 Water/Wastewater	TBA	FREE
March 2-6	2015 37 th Annual Management & Technical Conference	Sunriver	2.3 Water/Wastewater	TBA	Fee
March 24-25	2015 Wastewater (WWT/WWC) Certification Review	Salem	1.4 Wastewater/0.6 Water	2295	Fee
May 5-6	2015 Water (WT/WD) Certification Review	Salem	1.8 Water/1.1 Wastewater	2737	Fee

Levels 1-4 Water Operator Exams

Trained and certified operators are necessary to ensure that systems are managed in a manner that fully protects public health and the environment. The OARs for certification stipulate that the qualifying experience for applicants for certification as a water treatment plant operator must attain at least half the required operating experience at a public water purification plant that uses complex filtration technology and is not more than one classification lower than the level of certification they are seeking. In other words, if you have only worked for a Class 2 treatment plant, we allow you to apply for a Level 3 certification but not a Level 4 certification. If you move on to a Class 3 plant, then you must have ½ the qualifying experience (at the Level 3 plant) before applying for a Level 4 certification. Reciprocity from state to state ensures that the operator has the operating experience for which they are certified.

For additional information, please visit <http://public.health.oregon.gov/HealthyEnvironments/DrinkingWater/OperatorCertification/Levels1-4/Pages/exams.aspx>

More Resources

Drinking Water Data Online <https://yourwater.oregon.gov>
Center for Health Protection <http://public.health.oregon.gov/PHD/Directory/Pages/Program.aspx?pid=4>
Drinking Water Services <http://public.health.oregon.gov/PHD/Directory/Pages/Program.aspx?pid=58>

State Wastewater Exam Dates

All categories: <http://www.deq.state.or.us/wq/opcert/stpoperexamsqry.asp>
(2015 dates have not been announced)
Year-round, open schedule for exams
For additional wastewater exam information, visit
<http://www.deq.state.or.us/wq/opcert/opcert.htm>

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Hiyo, Silver!

*Throwing My Loop
by Michael Johnson*

"A fiery horse with the speed of light, a cloud of dust and a hearty Hi Yo Silver! The Lone Ranger! With his faithful Indian companion Tonto, the daring and resourceful masked rider of the plains led the fight for law and order in the early western United States! Nowhere in the pages of history can one find a greater champion of justice! Return with us now to those thrilling days of yesteryear! From out of the past come the thundering hoof beats of the great horse Silver! The Lone Ranger rides again!"

And then we would hear...

"Come on, Silver! Let's go, big fellow! Hi Yo, Silver! Away!"

(Isn't that just about the best thing you ever heard in your life?)

According to Wikipedia, The Lone Ranger came into the world in 1933 from a WXYZ Detroit station script writer named Fran Striker. For 2,956 episodes, The Lone Ranger and Tonto rode right through the radio into living rooms all across America. Though the series was aimed at children, adults made up at least half the audience. The television show aired from 1949 until 1957 starring Clayton Moore as the Lone Ranger, and Jay Silverheels (Harry Smith) – a Mohawk lacrosse player from Canada - as Tonto. Both Moore and Silverheels took their responsibility as role models for young people seriously all their lives. Here are a few examples from the "Lone Ranger's Creed."

"To have a friend, a man must be one."

"All men are created equal and all have to power to make this a better world."

"God put the firewood here, but every man must gather and light it himself."

"We must be prepared to fight physically, mentally, and morally for what is right."

"That sooner or later, somewhere, somehow we must settle with the world and make payment for what we have taken."

"That all things change but truth, and that truth alone, lives on forever."

"I believe in my Creator, my country, and my fellow man."

(Think there's any way we might bring that back?)

Why the mask? Because when six Texas Rangers are ambushed by outlaws at the beginning of the series, an Indian named Tonto comes along to find one Ranger remains alive. Tonto saves the life of the young man named John Reid. Tonto digs six graves to trick the outlaws into believing all the Rangers are dead. The Lone Ranger dons his mask to honor his fallen comrades so the outlaws will never know which one brought them to justice.

My favorite episode tells the story of how Silver came to be with the Lone Ranger. In the early days, the Lone Ranger rode a chestnut mare called Dusty. The Lone Ranger and Tonto happen on a white stallion fighting an enraged buffalo. The horse is severely injured, but Tonto applies a poultice made from tree sap, and the two men spend the night by firelight ministering to the fallen animal. As you might expect, the horse is alive at dawn. Tonto and the Lone Ranger watch him rise and begin to trot away. "Him make good horse for you, Kemo Sabe," says Tonto.

"No, Tonto," says the Lone Ranger. "It must be his decision."

Silver stops and turns to look at the two men...then comes trotting back to the Lone Ranger.

The rest is history.

The Lone Ranger always spoke precisely and used perfect grammar. Neither he nor Tonto ever drank or smoked, and when forced to use their guns, only maimed their opponents as painlessly as possible. And that's why he used silver bullets – to remind himself that life was precious and should not be wasted or thrown away. And no matter how hard we might try, you and I simply cannot imagine the Lone Ranger or Tonto ever being in a saloon at two in the morning... and shooting themselves in the leg with their own gun... now, can you?

Clayton Moore was born in Chicago, Illinois. He began his career as a circus acrobat at age eight, later becoming a trapeze artist. Silverheels suffered a stroke in 1976. For years prior, the Lone Ranger and Tonto had ridden in the Tournament of Roses Parade in Pasadena; the Lone Ranger on Silver and Tonto on the paint called "Scout." In 1977, Clayton Moore rode alone, and that was the



only day the Lone Ranger ever rode a horse other than Dusty or Silver. On that day to honor his friend...the Lone Ranger rode a paint.

Clayton Moore died in California at age 85 in 1999 from a heart attack. Throughout his career, he expressed love and respect for Jay Silverheels. Silverheels – who also lived in California - died in 1980 due to complications from the stroke he suffered earlier. He was 67 years old.

On their arrival in heaven, I'm sure the Lord himself must have helped Saint Peter check them in...and heaven is all the better for it.

—Michael Johnson
Junior Lone Ranger



MEMBERSHIP APPLICATION

Name: _____

Address: _____

City/State: _____

County: _____ ZIP: _____

System Email: _____

Phone: _____ Fax: _____

Operator: _____

Contact Person: _____

Number of Hook-ups: _____

Were you referred? By whom _____

Type of System:

☐ Water ☐ Wastewater ☐ Both

Membership Category Amount of Dues

- | | |
|--|--------------------------------|
| <input type="checkbox"/> Regular Member | \$ _____
See schedule below |
| <input type="checkbox"/> Associate Member | \$400.00 |
| <input type="checkbox"/> Individual Member | \$75.00 |

Regular Member Dues Schedule

1 to 100	\$75 + 29 cents per hookup
101 to 500	\$80 + 29 cents per hookup
501 to 1,000	\$90 + 29 cents per hookup
1,000 and up	\$100 + 29 cents per hookup
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Name on Card: _____

Signature _____

MB14

Membership Types

Regular Member

A Regular Member shall be any water or wastewater utility, public or private, engaged in the production, distribution or reclamation of water. A Regular Member shall have one vote.

Annual Dues - See Dues Schedule

Associate Member

An Associate Member shall be any organization individual or corporation, supplying services or equipment to wastewater utilities. An Associate Member shall have one vote. For Associate Member Benefits, please contact OAWU.

Annual Dues \$400.00 per year

Individual Member

An Individual Member shall be an individual involved in the water/wastewater industry or a user of such utilities. The membership is informational in nature and shall be non-voting.

Annual Dues \$75.00 per year

Benefits of Membership

- On-site technical assistance
- Various free training programs
- Discounts on training courses
- Discounts on Annual Conference registration
- Access to on-site training program
- Subscription to quarterly *H2Oregon* magazine
- Direct mailings in your area about upcoming training courses
- Summaries of legislative issues
- Legislative representation at state and federal level
- Associate Member Services and Products Guide
- Access to technical assistance library
- Access to technical and testing equipment for loan
- Voting rights in Association affairs (Regular & Associate Members)
- Positive contacts with other organizations
- Camaraderie with water and wastewater professionals
- Operator Of Record services
- Job referrals, announcements and searches
- Well testing
- Plan review
- System performance evaluation and options
- Additional programs and services
- Disaster response assistance and planning





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Adair Village, City of
Adams, City of
Adrian, City of
Agate Water Company
Albany Rifle & Pistol Club
Alpine Crest Improvement Dist.
Amigo Villa Water Service, Inc.
Amity, City of
Ananda Center at Laurelwood, Inc.
Arch Cape Service District
Arlington, City of
Arrah Wanna Water Company
Arrowhead Mobile Home Park
Aspen Lakes Utility Company, L.L.C.
Athena, City of
Aumsville, City of
Aurora, City of
Avion Water Company
Baker City, City of
Bandon, City of
Banks, City of
Barlow Water Improvement District
Barlow, City of
Bay City, City of
Bay Hills Water Association
Beaver Water District
Bella Casa Mobile Home Park
Bend Research Inc.
Bend, City of
Benton County Service District
Berndt Creek Water Corp.
Black Butte Ranch
BLM Eugene
Blue River Water District
Blue Spruce Mobile Estates
Bly Water & Sanitary Dist.
Boardman, City of
Bonanza, Town of
Boring Water District #24
Brandy Bar Landing, Inc.
Breitenbush Hot Springs
Bridge Water District
Brooks Community Service District
Brownsville, City of
Buell-Red Prairie Water District
Bunns Village Properties, LLC
Burns, City of
Burnside Water Association
Butte Falls, Town of
Camp Rilea
Camp Tapawingo
Camp Yamhill
Canby Utility
Cannon Beach, City of
Canyon City, Town of
Canyonville, City of
Carlton, City of
Cascade Head Ranch Dist. Improv. Co.
Cascade Locks, City of
Cave Junction, City of
Cedarhurst Improvement Club, Inc.
Century Meadows Sanitary System, Inc.
Century Meadows Water System, Inc.

Chaparral Mobile Ranch
Charles Tracts Water Company
Chehalem Mt. Sun Ridge Association
Chenoweth Water PUD
Chiloquin, City of
Christmas Valley Domestic Water
Cimmarron City Water Co., Inc.
Circle C Improvement District
Clarks Branch Water Association
Clatskanie, City of
Clayton Creek Water Association
Cline Butte Utility Company
Cline Falls Mobile Home Park
Cloverdale Sanitary District
Cloverdale Water District
Coburg, City of
Colton Water District
Columbia City, City of
Columbia Hills Homeowners Association
Columbia River PUD
Conagra Foods
Condon, City of
Coquille, City of
Corbett Water District
Cornelius, City of
Country Club Water District
Country View Mobile Estates
Covanta Marion, Inc.
Cove Orchard Water Association
Cove, City of
Crater Lake National Park
Crescent Water Supply & Improvement District
Creswell, City of
Crooked River Ranch Water Company
Crystal Springs Water District
Culver, City of
Dallas, City of
Dane Clark Water District
Dayton, City of
Dayville, City of
Deception Creek Mobile Park
Deer Creek Estates Water Assn.
Deerhorn Community Water Association
Depoe Bay, City of
Deschutes River Improvement District
Deschutes Valley Water District
Detroit, City of
Dexter Oaks Mobile Home Park
Dexter Sanitary Service
Diamond Peaks Tract 1355
Diamond Summit Association
Dietz Airpark Water System
Donald, City of
Drain, City of
Drifters Mobile Home Park
Dufur, City of
Dumbeck Lane Water Association
Dundee, City of
Eagle Point, City of
East Yamhill Rural Water Company
Eastmont Water Company
Eastshore Water Improvement District

Echo, City of
Elkton, City of
Enterprise, City of
Estacada, City of
Eugene Mobile Village
Fairview Water District
Fairview, City of
Falcon Cove Beach Water District
Falcon Heights Water & Sewer District
Fall Creek Water District
Falls City, City of
Fern Ridge School Dist. 28J-10
Fern Valley Estates Improvement Dist
Fernridge Mobile Estates
Fir View Water Company
Fischer's Place Mobile Home Park
Fishhawk Lake Recreation Club, Inc.
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Forest Park Mobile Village
Fossil, City of
Garden Valley Water Assn
Garibaldi, City of
Gaston, City of
Gates, City of
Gearhart, City of
Gervais, City of
Gilchrist Water Co., LLC
Gladstone, City of
Gleneden Sanitary District
Glenmorrie Co-op Association
Glide Water Association
Goble Water Association
Gold Beach, City of
Gold Hill, City of
Government Camp Water Company
Grand Prairie Water Supply Company
Grand Ronde Community Water Association
Grand Ronde Sanitary District
Grand View Mobile Home Park
Granite, City of
Grants Pass, City of
Green Oaks Mobile Ranch
Greenhoot Properties
Gresham, City of
Haines, City of
Halfway, City of
Hall's Trailer Court
Halsey, City of
Harbor Water PUD
Harrisburg, City of
Hebo Joint Water/Sanitary Authority
Heceta Water District
Heppner, City of
Hidden Valley Mobile Estates Impr. Dist.
High Lostine Owners Association
Highland Water District
Hiland Water Corporation
Hillsboro, City of
Hines, City of
Hood River, City of
Hopewell Water Company
Hubbard, City of
Hunnell Hills Water System

Huntington, City of
HWY 58 Trailer Park
Ice Fountain Water District
Idanha, City of
Idleway Improvement District, Inc.
Imbler, City of
Independence, City of
Indian Meadow Water Company
Interlachen Water PUD
Ione, City of
Irrigon, City of
Island City, City of
Jackson County Parks
Jacksonville, City of
Jewell School District
John Day Water District
John Day, City of
Johnson Creek Water Services Company
Junction City, City of
Juniper Mobile Home Park
Keizer, City of
Kelly's Brighton Marina LLC
Kelso Water Association
Keno Water Company, Inc.
K-GB-LB Water District
Kingswood Heights Water Association
Klamath Falls, City of
Klippel Water, Inc.
Knappa Water Association
Knoll Terrace MHC
L.A. Water Cooperative
La Casa Mia
La Pine Utilities, City of
Labish Village Water Commission
Lady Creek Water System
Lafayette, City of
Laidlaw Water District
Lake Grove Water District
Lakeshore Estates
Lakeside Water District
Lakeside, City of
Lakeview, Town of
Lakewood Utilities, LTD
Lamontai Improvement District
Lamplighter Water Association
Lane County Parks
Langlois Water District
Lark Meadows Water Association
Laurelwood Water User's Co-op
Lawrence Subdivision Water Association, Inc.
Lebanon, City of
Lexington, Town of
Lincoln City, City of
Little Beavers Preschool
Long Creek, City of
Lostine, City of
Lowell, City of
Luckiamute Domestic Water Co-op
Lyons-Mehama Water District
Madras, City of
Madrone Hill MHP
Malin, City of
Manzanita, City of



MEMBERS



Mapleton Water District
Maupin, City of
McKay Acres Improvement District
McKenzie Palisades Water
McMinnville Water & Light
McNulty Water PUD
Medford Water Commission
Merrill, City of
Metolius Meadows Prop. Owners Assn.
Metolius, City of
Midland Water Association
Mill City, City of
Milo Adventist Academy
Minikahda Water District, Inc.
Mitchell, City of
Modoc Point Sanitary District
Molalla, City of
Monmouth, City of
Monroe, City of
Monument, City of
Moran Water System Association
Moro, City of
Mosier, City of
Mossy Brae Water District
Mt. Angel Abbey
Mt. Angel, City of
Mt. Ashland
Mt. Bachelor, Inc.
Mt. Vernon, City of
Mulino Water Dist. #23
Myrtle Creek, City of
Myrtle Point, City of
Nantucket Shores Water Company
NeahKahNie Water District
Nehalem, City of
Nesika Beach-Ophir Water District
Neskowin Regional Sanitary Authority
Neskowin Regional Water District
Netarts Water District
Netarts-Oceanside Sanitary Dist.
Newberg, City of
Newport, City of
North Corvallis Mobile Home Park
North Hill Water Corporation
North Plains, City of
North Powder, City of
Northwest Newberg Water Association
Nyssa, City of
Oak Lodge Water District
Oakland, City of
Oakridge, City of
Oaks Mobile Home Park
Oceanside Water District
Ochoco West Water & Sanitary Authority
Odell Sanitary District
Odell Water Company
Olney-Walluski Water Association
OPRD Main Office- Salem
Orchard Heights Water Association
Orchard Point Mobile Homes
Oregon Shores Beach Club, Inc.

Oregon Water Wonderland II Sanitary District
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Otter Rock Water District
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Paradise/ Rogue Meadow WS
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Parrett Mountain View Estates
Perrydale Domestic Water Association
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Phoenix, City of
Pilot Rock, City of
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Polehn Heights Water Association, Inc.
Ponderosa Pines Water Company
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Power City Water Co-op
Powers, City of
Prairie City, City of
Prineville, City of
Pristine Water Source, LLC
Quincy Water Association
Rainier, City of
Redmond, City of
Redwood Water Service, Inc.
Reeder Ranch, Inc.
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Rimrock West Improvement District
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Rocky Pointe Marina
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Rogue Lea Estates MHP LLC
Rogue River, City of
Rogue River-Siskiyou National Forest
Roseburg Forest Products Co.
Round Lake Water Utilities
Rufus, City of
Running Y Utility Company
Sandy, City of
Salem, City of
Salem-Keizer School District

Salmon River Mobile Village
Sam's Valley Elem. School Dist. #6
Scappoose, City of
Scenic Fruit Company
Scio, City of
Scofield Mobile Home Court
Scotts Mills, City of
Scravel Hill Water Co-op
Seal Rock Water District
Seneca, City of
Shangri-La Water District
Sheridan, City of
Sherwood, City of
Siletz, City of
Silver Falls School District 4J
Sisters, City of
Skylane Farm
Skyview Acres Water Co-op
Sodaville, City of
South Fork Ranch Homeowners, Inc.
South Fork Water Board
South Hills Water System, Inc.
Southwest Lincoln County Water District
Southwood Park Water District
Spirit Mountain Gaming, Inc.
Spray, City of
Springbrook Water Association
Squaw Creek Canyon Development
St. Paul, City of
Staffordshire Water System, Inc.
Stanfield, City of
Star Satellite Improvement District
Steeves Mobile City
Storlie Water Company Inc.
Sublimity, City of
Suburban East Salem Water District
Sumpter, City of
Sunridge Estates
Sunriver Water LLC
Sunset Acres Water Improvement Co.
Sunset Lake RV Park
Sunset Water Systems, Inc.
Sutherlin, City of
Sweet Home, City of
Talent, City of
Terrace Mobile Plaza
Terrebonne Domestic Water District
The Dalles, City of
Three Rivers School District
Tierra Del Mar Water Company
Tigard, City of
Tillamook Bay, Port of
Tillamook County Creamery Association
Tillamook, City of
Timber Water Association
Toledo, City of
Tollgate Water Co.
Tone Water
Trappist Abbey
Tri City Water & Sanitary Authority
Troutdale, City of
Tualatin Valley Water District
Turner, City of

Twin Rocks Sanitary District
Tygh Valley Water District
Ukiah, City of
Umatilla, City of
Umpqua Basin Water Assn.
Union, City of
Unity, City of
US Army/ COE, Cottage Grove Lake Office
Vale, City of
Valley View Water Co-op
Valley View Water District
Veneta, City of
Vernonia, City of
VMWID
Waldport, City of
Wallowa Lake Co. Service District
Wallowa, City of
Warm Springs, Conf. Tribes Reservation of OR
Warren Water Association
Warrenton, City of
Wasco, City of
Water Wonderland Improvement District
Watseco-Barview Water District
Wedderburn Sanitary District
Weiss Estates HOA, Inc.
Welches Water Company
Weldon Mobile Home Park
West Hills Water Company
West Linn, City of
West Slope Water Dist.
West Yamhill Water Company
Western Heights Water Association
Westfir, City of
Weston, City of
Westport Water Association
Wheeler, City of
Whispering Pines #4
Wickiup Water District
Willamette Water Company
Willamina, City of
Wilson River Water District
Wilsonville, City of
Wi-Ne-Ma Christian Camp, Inc.
Winston-Dillard Water District
Wood Village, City of
Woodburn, City of
Yachats, City of
Yamhill, City of
Yoncalla, City of
Young Life's Washington Family Ranch
Young's River Lewis & Clark W.D.
Zig Zag Water Cooperative, Inc.

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William Chacon
Greg Close
Frank Dunn

Paul Eckley
Kellen Fujisawa
Pat Gammell
Shane Henderson

Allen Iverson
Tim Rettke
Henry Thomson
Anita Yap

Kamstrup Water
Metering
Salem-Keizer School
District

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Anderson, James	Costantino, Gregory	Golden, Kirk	Johanesen, Joe	Moniz, Garrett	Sheppard, Neal F.	Wallace, Neal
Anderson, Ken	Dahlberg, Mike	Gonzalez, Jorge	Johnson, Bret	Montgomery, Martin L.	Sherlock, Christopher	Wanner, Ron
Anderson, Kevin	Dammeyer, Scott	Goodpasture, Joe	Johnson, Bron	Mooney, Ronald	Simenson, Donald J.	Warwick, Gordon Jay
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Ashenberger, Jacob	Davenport, Ray	Grabner, Robert	Katrena, Scott	Naught, Lester	Smith, Craig	Weaver, Rick
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Barnett, Brion	Davis, Willie Jr.	Griffin, Beverly "Bev"	Kirk, Jeremiah	Nussbaumer, Mitch	Smith, Randall	Wheatley, James
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Bradshaw, Dave	Ehredt, Tyler	Henderson, Shane	Lund, Darrell	Porter, James	Stinnett, William	Woodward, Steve
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Buckley, John	Evans, Peter M.	Hodge, Patrick R.	Maine, Mike	Rettke, Tim	Strassner, Bob	
Burton, Howard	Farris, Randy	Hodge, Steve D.	Malley, Susan	Robertson, Donald	Tabrum, Walter	
Buskirk, Jeff	Flande, Mark	Hook, Ryan	Mangini, Jered	Sander, Faye	Thayer, Bradley	
Caire, Tim	Flores, Steve	Hoover, Max	Marshall, John	Sannar, Todd	Thompson, Jake	
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Chacon, William	Gammell, Pat	Hunt, Kevin	McTeague, Kyle	Schroeder, Michael	Turner, Keith	
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ASSOCIATE MEMBERS

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Advantage Precast Inc.	Correct Equipment, Inc.	Inc.	Oregon Public Utility	The Automation Group
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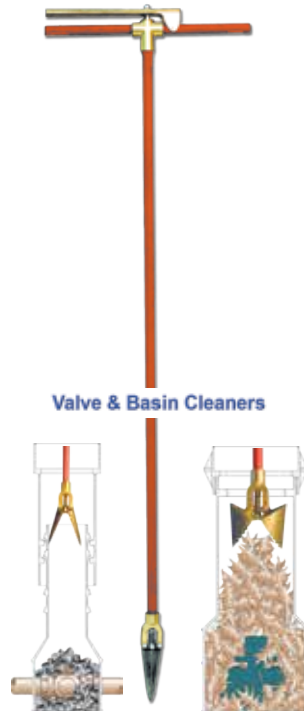


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