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Spring 2021 Vol. 43, No. 2

Smart Solutions. Clean Water.





Sources Contents

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We are also seeking articles, clean jokes, Oregon trivia, letters and interesting stories.

Please send submissions (no more than two pages in length) to:

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Cover photo by Mike Collier McKenzie River near Carmen Reservoir

Highlights from the 43rd Annual Management & Technical (Virtual) Con	ference 4–5
Making the Most of Virtual Learning	
by Heath Cokeley, Program Manager/Circuit Rider	6
Arsenic Problems? by Bob Waller, Water Circuit Rider	8–9
PFAS by Keith Bedell, Wastewater Technician	10–11
Malware 101 by Scott Berry, Operations Manager	12–13
Water Management Conservation Planning — Next Steps	
by Tim Tice, Projects Manager	14–15
Life at Home When a Circuit Rider is on the Road	
by Hans Schroeder, Circuit Rider	
Stumbling by Mike Collier, Deputy Director/Source Water Specialist	18
Mark Your Calendar—Upcoming Conferences	21
Hacking: Real Risk to Infrastructure by Summit Security Group	22
Training & Events Schedule	25
Thanks to OAWU's 2021 Sponsors	27
Quiz Corner	27
Membership Application Form	29
Membership Roster	

We Appreciate our Advertisers! Please take a moment to view their ads.

Advanced Control Systems26
Bancorp Insurance11
BioLynceus23
BMI24
Core & Main4
EJ13
Energy Trust of Oregon20
H.D. Fowler
ITC
Lakeside Utilities (EZ Street Cold Asphalt)24
NeptuneInside Back Cover

Oregon DEQ: Clean Water State Revolving Fund21
Orenco Systems
Owen Equipment15
PACE Engineering11
Pittsburg Tank & Tower9
Puttman Infrastructure24
Special Districts Association of Oregon9
The Automation GroupInside Front Cover
Underground Tech28
USA BlueBookBack Cover

Oregon Association of Water Utilities

H₂Oregon Spring 2021 • 1

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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.

Just a Glimpse

by Jason Green, Executive Director

The Internet and the endless information and entertainment can, for some, be distracting. From life. I have come to live with the Internet, mostly. I am impressed with those who immediately think to look things up, seemingly without a second thought. To measure a comment or statement. To learn about something or how to do a particular task. Accessing knowledge and learning were primarily from a teacher/lecture, mentor, books and experience not that long ago. So much is instantly accessible now. I think I have read that knowledge puffs a person up. Take that for what its worth, but I wonder—immediate access to so much knowledge? Quick to judge? Perhaps.

Try experience. What about that? What about those who struggled to learn, maybe then spending years doing it. Searching and learning along the way. Books maybe, internet certainly. Application and practice. They are now experts in their fields. Adding experience and years, in most cases I would think, provides an advantage. Try a heart or a neurological surgeon? Me? I think I'd like a little experience if I had to go meet those hands!

We are quick to identify traits in others that we appreciate, respect and I think quicker to identify those that we abhor. I believe there is something about the latter—we see a trait or a fault in someone else we very much dislike and many times it is present in ourselves. Being sure of oneself and capable can some-times be misidentified as pride and or arrogance. I don't wish to focus on the ability or inability here, but on the arrogance. Pride can sometimes be useful, but I have not known in myself or others where arrogance can be of any use. Arrogance and haughtiness seem to only hinder the person who might otherwise excel. And I might add, it's rare to hear any discussions of this or similar matter anywhere today apart from gossip. Why is that? We don't talk about it, but we know it's not ok.

Just a quick glimpse or reflection of our own arrogance should be distasteful. Yes? We can study on it. We grasp it and then we don't. I sincerely believe this and other traits seen in action with the pressures of life, family and work, should be contemplated. If I am offending others because of my arrogance then I am likely not as useful nor will people want to be around me. I think it is worthwhile to attempt to work on positive character and behaviors. We might also look to be an example for those watching us - of course we know the important opposite and rare characteristic of arrogance is humbleness and humility. How does one work together and serve others without it? We are public servants. Maybe we will see and also share just a glimpse of this more valuable attribute!

My best to you.



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At this year's conference we were blessed with a week of beautiful, sunny weather, at least here at the OAWU office in Independence. The OAWU staff enjoyed serving the members of the Association and aiding those in need on the virtual platform. The conference went off relatively well, not as great as in person, but not too bad for virtual.

The conference sessions were led off by Jason Green, OAWU Executive Director, Russ Cooper, OAWU NRWA Director and Mike Edwards, OAWU Board President. They welcomed attendees, discussed the state of the Association, and provided an update on the issues the industry is facing at a national level. This was followed by Mark Landauer who presented an update regarding the legislative issues at the state level.

The OAWU annual business meeting was held after class sessions ended on Tuesday. President Mike Edwards presided over the meeting as attending members heard committee updates and participated in board member elections. The slate of board members who were submitted by the Nomination and Development committee and elected to the board were:

- Mike Edwards, City of Bend, Reg 1, Exp 2024
- Kris Schneider, Schneider Water Services, Associate Member Rep., Exp 2024
- **Tim Lyda**, City of Tillamook, Reg 3, Exp 2024

HGHLIGHTS

- Joel Gehrett, Deschutes Valley Water District, Reg 3, Exp 2024
- **Russ Cooper**, City of Independence, Reg 3, Exp 2024

At Wednesday's regular board meeting officer elections for 2021 occurred. They are: **Mike Edwards** as President, **Matt Johnson** as Vice President, **Craig Smith** as Secretary, **Micah Olson** as Treasurer, and **Mark Beam** as Past President. We would like to thank and recognize our retiring board members: **Mark Kerns**, Avion Water, years of service 1997–2020; **Phil Davis**, Odell Water Company, years of service 2005–2020; **Ed Butts**, 4B Engineering, years of service 1998–2021—thank you for your many years of direction and service to OAWU.

The awards that are typically done at the Annual Conference during the Annual Banquet, the drinking water competition, and the raffles will be held in person at this year's Summer Conference that is planned for August 23–26 in Seaside.

The Overall Best Water award recipient for 2020 was **Crooked River Ranch**. They went on to compete at this year's Best Water in the Nation contest, and a congratulations needs to go out to Crooked River Ranch for coming in tied for second — that is great news.

Don't forget, if you have an employee whom you would like to nominate for an award this year please submit the information to the OAWU office by July 31, 2021.

Remember to apply for the Jeff Swanson Memorial Scholarship by July 31, 2021, the application for the 2021–22 academic year can be found on our website, please apply if you have a dependent that is currently attending or going to attend college.

We wish to thank our Associate Members for their donations, time, and support of this conference and of course to the members who continue to believe in and support the Oregon Association of Water Utilities. Additionally, we would like to especially thank our Gold Sponsors of this year's conference: **Core and Main** and **Lakeside Industries**; our Silver Sponsors, **HD Fowler Company, Inc.** and **CoBank**; and our Bronze Sponsors, **EJ** and **PACE Engineers**.

Be sure to sign up for the Annual Conference next year, the first full week of March 2022, as there will be a slate of new classes to attend, people in our industry to visit, food to eat, and fun to enjoy. See you there! Best wishes to you, our friends. ●



Oregon Association of Water Utilities





Making the Most of Virtual Learning

Heath Cokeley, Programs Manager/Circuit Rider

Like many of you, I miss our time training in person in the classroom. In-person classroom learning is not only great for hands-on learning that helps for retention and skill building, but also networking. Over the last year, our way of communicating has shifted completely to more frequent use of emails and video calls to connect and troubleshoot. While our experience with virtual training is growing, OAWU is committed to providing excellent content, high quality facilitators, and the same responsiveness to your learning needs as we would in person.

With virtual learning at the comfort of your home or office, there are some positive aspects, including access to training content from anywhere with good internet, and overall cost savings including no travel or hotels. Virtual training is also great for some as I realize some people prefer the virtual platform. Just because I am not personally one of those people, I can recognize the benefit for those that are. But virtual learning is not always easy, and can come with challenges that I am sure many of you are aware of:

- Internet and Technology Issues
- Too many different platforms to navigate
- Isolation

While we continue to live in a virtual learning world for the moment, I want to share some tips that I have found most helpful in making virtual learning more effective, at least for what it is.

Choose a place you can sit and participate in training, with limited distractions. If your office will be to distracting with emails, phone calls, and people coming by then try doing it from home. If home is too distracting as I know it can be then try and find somewhere else quit, just remember for you to get something out of the virtual training, you will need to put some effort in.

- Make sure you have a stable Internet connection. No one likes seeing frozen faces on screen!
- Don't forget to mute yourself when not talking. The mute button is your friend!
- Coffee, lots of coffee, and while we can't give you the donuts, we normally would in the classroom please know that we at OAWU are still buying those donuts and eating them ourselves. Not sure why I felt it necessary to include that, but I did.

Virtual training has its pros and cons and its place in the training world. Try to make the most of what you have. For me, I can't wait to see you all back in the classroom and with that I'll see you down the road!

6 • H2Oregon Spring 2021

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Arsenic Problems?

by Bob Waller, Water Circuit Rider

On January 22, 2001, EPA adopted a new standard for arsenic in drinking water of 0.01 mg/l or 10 parts per billion (ppb), replacing the old standard of 50 ppb. Water systems had to meet the new standard by January 23, 2006. This new standard put many water systems out of compliance or on the edge of compliance.

In areas where the drinking water contains unsafe levels of arsenic, the immediate concern is finding a safe source of drinking water. There are two main options: Finding a new safe source or removing arsenic from the contaminated source. If an arsenic safe water source cannot be established, we will need to reduce arsenic levels. There are several methods available to remove arsenic from water; Oxidation,Coagulation (precipitation and filtration), Adsorption (sorptive filtration), or Ion Exchange.

Long-term consumption of water with arsenic above the drinking water standard may increase the risk of health problems of the skin, circulatory system, nervous system, lungs and bladder. These health problems include some forms of cancer. From time to time I will visit water systems that have questions about arsenic in the water. They may have an arsenic system that just doesn't do the job or the cost to operate is excessive.

My experience in the removal of arsenic from drinking water was limited because I worked for a system with very low arsenic levels. I decided to do some research on the subject, so I have talked to several companies that specialize in arsenic removal. We all want a system that will remove arsenic from our water that is both affordable in cost of installation, and low maintenance. While this may be hard to achieve the best way to approach this issue is first to have the water tested to see the amount of arsenic as well as the type. Arsenic (As) occurs in the soluble form as As(III) (arsenite) under anaerobic conditions predominantly in groundwater and as As(V) (arsenate). As(III) may require oxidation before removal. There are other substances in water that may affect treatment such as sulfate and nitrate levels.

When discussing which type of treatment is best for an individual system, we should provide a complete water analysis from our lab. Also, we may be asked how many connections are in the system, the pump rate, gallons per day the system uses, and the pipe size of the distribution system. There are other questions we will be asked, so the more prepared we are the better chances for a good fit. Having this information ready is important, but also having a list of questions of our own questions. Are there systems using this type of equipment in my area, does it have some method of regeneration such as backwash or through the use of chemicals, how long before we have to replace the media, who can replace the media and what does that cost? Here is a link to Frequently Asked Questions - Recommended arsenic treatment methods: http://njarsenic.superfund.ciesin.columbia.edu/faq-page/16



I'm sure there are many more you and your board can come up with.

Bottom line, there are no solutions that work for all systems, but know what you're getting. Sometimes systems have a treatment system installed and find out later they either didn't work as promised or the cost to replace the media or filter is more than the system can afford. There are new technologies being developed all the time so we should do our research. A good first step is OAWU, we may have visited a system that has solved something you're going through and can pass their experience on to you.

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Oregon Association of Water Utilities

PFAS

by Keith Bedell, Wastewater Technician

What do we know about perfluorinated chemicals? Originally, perfluorinated chemicals and perfluorocarbons were abbreviated as "PFCs," now we have multiple abbreviations of the thousands of chemicals that are in this group of toxic chemicals. PTFE (polytetrafluoroethylene) was first discovered "accidentally" in 1938 by Dr. Roy Plunkett at DuPont. After this discovery PTFE was made commercially available in 1947 with the trademark "Teflon[™]"</sup> from Chemours. It was the discovery of PTFE that accelerated the development of the other fluoropolymers.

- **PFAS** (per- and polyfluoroalkyl substances)
- PFOS (perfluorooctane sulfonate & perfluorooctane sulfonic acid)
- **PFOA** (perfluorooctanoate, perfluorooctanoic acid, perfluorooctane carboxylate)

They are perfluoroalkyl and polyfluoroalkyl substances, among the many others, that have fluorine and carbon as the main atoms in their construction.

Fluorine is a chemical element with the symbol F and atomic number 9. It is the lightest halogen and exists as a highly toxic pale yellow diatomic gas at standard conditions. Carbon (from Latin: *carbo*, "coal") is a chemical element with the symbol C and atomic number 6. It is nonmetallic and tetravalent—making four electrons available to form covalent chemical bonds. They are like the old bean bag you used to have when it got a hole in it. Small pieces everywhere that stuck to everything and you could not clean them all up, there was always a few stragglers left behind.

Long chain chemicals are designated by having 5–7 or more carbon atoms in their make-up and short chain chemicals less than 5–7 carbon atoms. Originally when they were first produced, the long chain was the combination used for commonly utilized household items that make life easier for people — nonstick cookware, stain-resistance for furniture and carpets, water proofing clothing, packaging on food products, and firefighting foams called Aqueous Film Forming Foams (AFFF). After finding these long chain chemicals in drinking water, they have switched to the short chain chemicals for production now.

The short chains have a shorter half-life, but there is concern that not enough research has been done to find out what the possible hazards of these could be. Because of their persistence in the environment, bioaccumulation, and toxic properties, they have been recognized as emerging environmental pollutants. The measurement of these chemicals is in the low parts per billion or nanograms per milliliter (ng/ml). To put this in perspective, one nanogram weighs a billion times less than a gram, and almost a trillion times less than a pound. One dollar in a billion dollars. So, you can see that these are exceedingly small and hard to remove from drinking water, wastewater, and the environment.

There are emerging solutions for the removal from drinking water and wastewater; currently none are cheap, but with increased production and newer technology the costs are coming down. Granular Activated Carbon (GAC), which has been used to adsorb natural organic compounds, taste and odor compounds, and synthetic organic chemicals, has been found to work well on the long chain PFAS. The problem with this method is that when the GAC has soaked up as much as it can,

10 • H2Oregon Spring 2021



then it needs to be replaced and the spent GAC needs to be incinerated (at 1,000 degrees C or 1,832 degrees F) and then it can be reused. The known effects of incineration are not well studied at this time, so the possible hazards of this option are still being researched. Anion exchange treatment is another method that works similarly to GAC, it can be cationic or anionic exchange resins and has shown high capacity for many PFAS chemicals. Once they are "full", then they are also incinerated, but completely, no reuse. Nanofiltration has been found to be extremely effective at removing PFAS. The problem with this is that the waste stream is a high-strength concentrated waste, which will still need to be taken care of.

The Air Force is working with Clarkson University on a new technology that uses a pair of plasma reactors. The way this technology works is explained in this description from a Business Insider article, "Argon gas at the bottom of reactors carries the PFAS molecules to the surface. The researchers then use high-voltage electrodes to generate plasma, an ionized gas made of free-roaming electrons and positive



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ions. The plasma zaps the water's surface, where it spreads across like fire, hitting the PFAS molecules and splitting them apart. Once the carbon and fluorine molecules have been separated, the PFAS compound is effectively destroyed."

There is plenty of information available, just make sure that what you read is from a reputable source. Please feal free to contact the OAWU office or ask any of our staff for help. We may be able to ask other resources, do research, or ask around at other systems to get you some additional insight. •

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Malware 101

by Scott Berry, Operations Manager

In the spirit of hindsight being 2020, I'm going to focus a few of my 2021 H2Oregon articles on topics related to emergency prevention, response, and recovery. The first of these articles will be on the topic of Ransomware. Much of the following information was obtained from the Federal Bureau of Investigations website on cyber security at www.fbi. gov/file-repository/ransomware-prevention-and-response-for-cisos.pdf/view.

In the interest of full disclosure, this topic is very new to me. I am of the age that still prefers paper and pencil, but it has hit home with me because in the past couple of years, there have been a few cities and counties, as well as many businesses in Oregon that have been attacked.

What is Ransomware?

Ransomware is the fastest growing malware threat, targeting users of all types—from the home user to the corporate network. On average, more than 4000 ransomware attacks have occurred daily since the first of January 2016. There are very effective prevention and response actions that can significantly mitigate the risk posed to your organization. Ransomware can lead to temporary or permanent loss of sensitive or proprietary information, disruption to operations, financial losses incurred to restore systems and files, and potential harm to an organization's reputation.

Ransomware may direct a user to click on a link to pay a ransom—however, the link may be malicious and could lead to additional malware infections.

Educate Your Personnel

Attackers often enter the organization by tricking a user to disclose a password or click on a virus-laden email attachment. Remind employees to never click on unsolicited links or open unsolicited attachments in emails.

Prevention is the most effective defense against ransomware, and it is critical to take precautions for protection. Infections can be devastating to an organization and may require the services of a reputable data recovery specialist. The FBI recommends that users and administrators take the following preventative measures to protect their networks from falling victim to a ransomware infection:

- Implement an awareness and training program. Because end users are targets, employees and individuals should be aware of the threat of ransomware and how it is delivered.
- Enable strong spam filters to prevent phishing emails from reaching end users and authenticate inbound email.
- Scan all incoming and outgoing emails to detect threats and filter executable files from reaching end users.
- Configure firewalls to block access to known malicious IP addresses.
- Patch operating systems, software, and firmware devices. Consider using a centralized patch management system.
- Set anti-virus and anti-malware programs to conduct regular scans automatically.
- Manage the use of privileged accounts based on the principle of least privilege: no users should be assigned administrative access unless they absolutely need it; and

those with a need for admin accounts should only use them when necessary.

- Disable macro scripts from file transmitted by email.
- Use application whitelisting, which only allows systems to execute programs known and permitted by security policy.
- Execute operating system environments or specific programs in a virtualized environment.
- Categorize data based on organizational value and implement physical and logical separation of networks and data for different organizational units.

Business Continuity Considerations:

- Backup data regularly. Verify the integrity of those backups and test the restoration process to ensure it is working.
- Conduct an annual penetration test and vulnerability assessment.
- Secure your backups. Ensure backups are not permanently attached to the computers and networks that they are backing up.

What to do if Infected with Ransomware?

- Isolate the infected computer immediately.
- Isolate or power-off affected devices that have not been completely corrupted.
- Immediately secure backup data or systems by taking them offline.
- Contact law enforcement immediately.
- If available, collect, and secure partial portions of the ransomed data that may exist.
- If possible, change all online account passwords and network passwords after removing the system from the network.
- Delete registry values and files to stop the program from loading.

There are serious risks to consider before paying the ransom. The FBI does not encourage paying a ransom to criminal actors. However, after systems have been compromised, whether to pay a ransom is a serious decision requiring the evaluation of all options to protect stakeholders, employees, and customers. Victims will want to evaluate the technical feasibility, timeliness, and cost of restarting systems from backup.

Ransomware victims may also wish to consider the following factors:

- Paying a ransom does not guarantee an organization will regain access to their data; in fact, some organizations were never provided with decryption keys after paying a ransom.
- Some victims who paid the ransom were targeted again by cyber criminals.
- After paying the originally demanded ransom, some victims were asked to pay more to get the promised decryption key.
- Paying could inadvertently encourage this criminal business model.

How can law enforcement help?

Any organization infected with ransomware should contact law enforcement immediately. Law enforcement may be able to use legal authorities and tools that are unavailable to most organizations. Law enforcement can enlist the assistance of international law enforcement partners to locate the stolen or encrypted data or identify the perpetrator. These tools and relationships can greatly increase the odds of successfully apprehending the criminal, thereby preventing future losses.



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14 • H₂Oregon Spring 2021



by Tim Tice, Projects Manager

Many water systems are in flux when it comes to water management conservation planning. Below are some steps you may be encountering:

- Beginning to develop a Water Management Conservation Plan (WMCP)
- Have already received Final Order of Approval of your WMCP
- Outlining a progress report as it relates to the WMCP
- Putting it on the back burner until you have the time to work on it

Whatever step you are in, one section of the review outline applicable for an operator or manager is OAR 690-086-0150 – Water Conservation Element. This section of the WMCP outlines the supplementary tasks necessary to meet the rules.

Water Use Measurement

Take a moment to review how water production is measured against the permits extensions of time and/or certificates your system holds. Know what allowances of water for each and review the paperwork for development limitations of any of the permit extensions of time. A "maximum allowed rate" of water for a permit can be significantly different than "allowed rate under development limitations." Some permits may have a *zero* allowance of water on a permit.

Development Limitations condition in a Permit Extension of Time Final Order freezes the amount of water that may be legally diverted under the extended permit to the amount of water diverted for beneficial use before the extension.

Specific Activities

As an operator or manager, know the requirements that establish five-year benchmarks for implementation of a schedule for the following:

- Annual water audit for estimating water uses for both un-metered authorized and unauthorized
- A schedule to install meters if your system is not fully metered
- Meter testing, replacement, and maintenance program
- Rates established on quantity of water metered at the service connection

The above four points are the initial items to help understand where the final destination of the water is delivered and accounted for. If statistics indicate a system leakage greater than ten percent, additional steps are required.

Two-year timeline

• Provide identification of factors for water loss and remedies to decrease loss

Five-year timeline

• Scheduled regular detection and repairs for leaks or a line replacement program

servation Planning-Next Steps

• Develop a water loss control program consistent with AWWA standards

The benchmarks written into the WMCP need to be followed up on and placed in the progress report, due five years after the final order of approval of the WMCP. The above bulleted points are requirements and as WMCPs are developed, often times the message gets lost in the handing over of the document. When steps towards proving up water loss are required, tasks require time and time requires personnel. How much time to execute the tasks varies per water system.

The ten bullets outlining specifics found in a water management conservation plan generalize those tasks and may or may not be required for all water systems. Many of the rules are based on the size of the water system (population served). Some tasks require additional steps, but these are focused on communities serving a population of at least 7,500. Whatever the tasks required by the rules our sized water system we should put together a game plan that will estimate time, equipment, and personnel to complete.

Managerially speaking, know what your permit extensions in time have for water allowed, with or without development limitations, and share this information with the Board, City Manager, etc.

Operationally speaking, knowing the tasks will provide an idea of the necessary money to pay for equipment and personnel or outside contracting. The method used to gather the data should be with an approved measuring device and use approved methods and understanding the percentage of water loss helps to remain in compliance with the regulations. As always, if you have a question, reach out to the Association, we will be more than happy to oblige. *The best that life has to offer!*



Oregon Association of Water Utilities

Life at Home When a

by Hans Schroeder, Circuit Rider

The Circuit Rider life can be quite fun. We get to go around the state and meet new people, see how different cities accomplish the same thing, but with different twists and turns to get to the same result. We have receive satisfaction in our work when the system calls and needs some expertise in an area and we can provide that service for them.

I will admit there is a lot of great things but let me show some of what has happened at my home while I have been gone on the road tending to some community emergencies. While I am gone my wife must work, take care of the kids, chores, etc. Plus, she gets to do all the stuff she would normally do if I were home. Once, when it was below 0° for over a week there was no water pressure in the house. So, my phone rings—I answer What's up babe to hear a voice a little higher than normal and talking a little faster saying there is no water pressure in the house. I say to her to go listen to see if the pump is running in the shop. Her answer is yes, ok then you need to walk around and see if there are any water leaks outside, of course there isn't. I then deliver the bad news she needs to crawl under the house and see if that is the problem. I then receive a video that sounds like a waterfall running and pictures of a pipe broken under the house. Of course, I can't go rushing home to help, I'm clear across the state teaching, so I explain what she needs and that I'm trying to think of someone who will drive out to what we call our little piece of heaven and everyone else thinks we are crazy for living out in the middle of nowhere, to help her. She shuts the well off and will have to use bottles and buckets of water to flush toilets, brush teeth, drink, and-her favorite-to heat up on the stove to take a quick bath. Luckily, I find someone, one of her old coworkers from a nearby city, that comes out to rescue us.

Maybe it's the time the bull keeps getting through the extra fences I put up before I left so he would stay in the pen and breed the cattle we wanted bred—not our one-year-old heifers—and gets them bred as well. She calls me: again the voice is a little higher and she is aggravated, she says that she is shooting the bull because she has had it with the idiot, and she is also in tears because her favorite two-year-old heifer that was just bred has hung itself on some of the strings on a big bale of hay. I try to get a hold of someone to deal with the heifer, but when I can't I let her know that she will need to get rid of the heifer and NOT to shoot the bull; that I'll take care of him as soon as I get home. (I did do a little extra praying that she actually listened and there isn't a dead bull when I get home.)

There is also the big ice storm that hits, and my wife wakes up with tree branches all over the fence, cars, heat pump and yard and she is going to run the chainsaw of which she has limited experience, which I tell her emphatically *please don't!!!!* Luckily, some of our son's friends drove by and saw her outside doing it all by herself before she had to



Oregon Association of Water Utilities

16 • H2Oregon Spring 2021

Circuit Rider is on the Road

leave to go to work. They called Casey in North Dakota to see if they should go help, Casey told them yes please, she will have the chainsaw out and dad is out of town. So again, someone came to our rescue.

Another fun incident when I was out of town is when she went to the barn to feed and there were things floating in the barn. Big things.



She knows I had just put a shutoff valve inside the barn to help isolate things, but when she heads towards it, she keeps sinking deeper and is afraid it is kind of like quicksand. I get the phone call, I try to explain to her about where I had put the shutoff valve, right by the snowmobile in the barn and she said she knew that much, but there is about a foot of water and she kept sinking deeper and deeper. She does the "oh forget it," walks over to the shop and shuts off the entire well. She decides to make do with the jugs of water she filled up to flush the toilets and brush her teeth until the water recedes. My wife is one tough cookie, I can honestly and luckily say; she was raised by her grandparents on a ranch in Wallowa County. She has rebuilt makeshift fences, chased cows, horses, goats, rebuilt the water line, while I have been on the road. Dealt with animal injuries, knowing we don't go to the vet every time one of them gets an owie.

I'm sure you got a good chuckle out of this little insight into my life as a circuit rider. However, I'm sure spouses of water and wastewater operators can relate. There are the functions that happen in our town that the city isn't even in charge of, but the locals know where we live so they come knock on our door to let us know the public bathrooms are out of toilet paper or paper towels and could you possibly go refill them. The night there are kids playing in different gyms, but our spouse needs to handle it because we have a city council meeting or a budget meeting. The nights or weekends we miss the concerts, games, family activities because it's our turn to do city chores and we need to stay close. The late nights or early mornings we are on duty to get the streets plowed so everyone can get to or from work.

So, every once in awhile don't forget to thank your spouse for the love and support they give us to help cover things at home while we are doing our job.

I know not everyone has a "ranchito" like we do, but still, it's the little things we need to remember to say *thank you* for. Remember we are in 2021! This is the year we need to be thankful — if 2020 taught us nothing, it taught us that. •



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Stumbling

by Mike Collier, Deputy Director/Source Water Specialist

I have had a lot on my mind throughout these current months and I wanted to take the time to disclose some of them to you all here. In my opinion there have been many changes in the country recently- some good, some bad and we have seen some extremes played out in the media.

Similar to the concepts in *Who Moved My Cheese?* by Spenser Johnson, during the current times, many things seem to be rapidly changing, and we have new expectations around us. We can try to learn to adapt to these changes (if they are out of our control), and even expect more changes. We can use these times to move forward through our fears and not let these fears and changes stop us from moving on and forward in our lives. We don't have control of these times; we only have control of our actions and attitude through them. If we don't choose to work through these times and stay positive, we may miss out on wonderful opportunities that may present themselves. If we choose to just "wait this whole thing out" or if we stay in fear of all the new circumstances, this may cause us to freeze with paralysis.

Throughout the events we see played out in the news and on social media, I have noticed a common thread: Emotionalism, which can be extremely dangerous not saying we cannot have emotions, but using events and images to create action or nonaction can be very detrimental. We should have level heads and think things out through reason when decisions are made. Reacting from emotions does not lead to good judgement and the actions and decisions that follow are usually poor. This is how we may be arrested for punching someone in the nose because they accidentally ran into our car. I do realize that sometimes in an emergency we will have necessity to suddenly react to an emotional situation and sometimes this must be done without reasoning through our options.

I have seen another dangerous trend that is happening in social media and being portrayed in the news. This is people trying to stifle or cancel people because they have a different opinion from themselves or opinions contrary to a group of people, they feal represent their views (not sure how they don't see the hypocrisy between these and our freedom of speech). Sometimes the people want to be culturally relevant and jump onto the bandwagon, they don't want to look like an outsider even if they don't completely agree so they join in on the cool thing to be a part of during this time and potentially pull others around them toward that idea/or ideal as well. We can be afraid of what others will think (or do) if we have a differing opinion or are tied so tightly to an opinion, we cannot admit we are wrong and will fight for a wrong idea until our figurative death.

I know that I am struggling with an ever-growing impatience for many of these items, the restrictions placed on us, school, the media, other people's aggressive-ness, politics, and the list goes on. I am trying to remind myself to stay positive. In the Nation right now, we talk about us vs. them and the splitting of the country. It is time to remember that we have much more in common with our fellow Americans than we would ever have in difference. •

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Hacking: Real Risk to Infrastructure

Cybersecurity experts have warned about the impending dangers of hackers exploiting vulnerabilities to our critical infrastructure for years.

Earlier this year, in just the kind of intrusion that has long been feared, hackers seized control of a water treatment plant in Oldsmar, Florida, a city of 15,000 people in the Tampa Bay area. In less than five minutes, the intruders were able to change the levels of a potentially dangerous chemical, Sodium Hydroxide, in the public water supply. Fortunately, the changes were noted by an alert operator, and the attack was foiled before any real harm could be done to residents of Oldsmar.

This is not the first attack on a municipal drinking water utility. The US Department of Homeland Security (DHS) has identified 16 lifeline infrastructure sectors and considers water utilities to be one of the main targets for cyberattacks. According to the Industrial Control Systems Cyber Emergency Response Team (ICS-CERT), water utilities, which encompass tens of thousands of public water systems, are the third-most targeted of all lifeline sectors. In July 2020, The Journal of Environmental Engineering published an article titled 'A Review of Cybersecurity Incidents in the Water Sector, in which researchers studied 15 cybersecurity incidents in the water and wastewater sector within the context of industrial network architectures. That study concluded these attacks were frequent, often sophisticated, and varied in motivation. Targeted systems included SCADA and PLC equipment, servers, workstations,

and network endpoints. The attackers sought to exfiltrate data, make unauthorized configuration changes, and install malicious software like ransomware and crypto-jacking code.

These incidents should serve as a wake-up call for utilities and providers of other critical infrastructure to focus on how they can ensure safety and protect their organizations from financial and brand liability. As one IT manager at a midsize water utility put it, "It's not a question of if, it's a question of when" hackers will disrupt vital U.S. water systems. "Most small and midsize utilities are overstressed," said the manager, who requested anonymity.

- The municipal water sector is a perfect target for hackers.
- There are approximately 54,000 distinct drinking water systems in the United States.
- Most of those systems serve fewer than 50,000 residents, with many serving just a few hundred or thousand.
- Virtually all of them rely on some type of exploitable remote access to monitor and/or administer these facilities.
- Often, they do not have a security professional or a large IT staff on hand.
- Many of these facilities are unattended, underfunded, and do not have anyone focused on examining the security of their technical infrastructure.
- Many facilities have not separated operational technology from safety systems that might detect

and alert to intrusions or potentially dangerous changes.

"If someone's hacked into the operational network and can control chlorination, do something to the [wastewater] digesters or can get control of the wastewater plant, that's the thing that keeps me up at night," said Mary Ann Holden, commissioner of the New Jersey Board of Public Utilities. "You could cause cholera or dysentery downstream, which could be a major city. How do you counteract that?"

In order to mitigate some of these risks, Congress passed America's Water Infrastructure Act in 2018. Any water utility serving 3,300 or more people is now expected to carry out a "risk and resilience" assessment of its networks, including a review of cyber defenses. The nation's biggest water providers were required to comply last year, while smaller companies were allowed until June of this year.

"Complying with this new law will help municipal water utilities ensure the safety of their customers, protect their brand, and mitigate financial risk to the utility," said Dan Briley, Managing Director of Summit Security Group, a multi-disciplinary firm specializing in Penetration Testing and Vulnerability Assessments.

Please contact Summit Security Group at reach@summitinfosec.com or check them out at summitinfosec.com for further information about cybersecurity risk mitigation.

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May 11	Math for Operators	Madras	0.4 Water/Wastewater	4329	Fee
May 11	Pumps and Pumping	Madras	0.3 Water/Wastewater/Onsite	TBA	Fee
May 12	Math for Operators	Tillamook	0.4 Water/Wastewater	4329	Fee
May 12	Preparing for a W System Survey & WW System Inspection	Tillamook	0.3 Water/Wastewater	4330	Fee
May 26	Confined Space & Job Site Safety	Tillamook	0.6 Water/Wastewater/Onsite	4331	Fee
June 1-2	Water Treatment, Water Distribution Certification Review	Keizer	1.4 Water/0.5 Wastewater/Onsite	4036	Fee
June 3	W. Treatment & Dist. Level 3,4 & Filtration Endorsement	Keizer	0.6 Water/Onsite	4034	Fee
June 17	Math for Operators	Island City	0.4 Water/Wastewater	4329	Fee
June 17	Pumps and Pumping	Island City	0.3 Water/Wastewater/Onsite	TBA	Fee
July 7	Developing Your Operations & Maintenance Manual	Eugene	0.4 Water/Wastewater/0.2 Onsite	4032	Fee
July 7	Leak Detection	Eugene	0.2 Water/Wastewater	TBA	Fee
July 20-21	Water Treatment, Water Distribution Certification Review	Redmond	1.4 Water/0.5 Wastewater/Onsite	4036	Fee
August 4	Lock Out Tag Out	Bend	0.3 Water/Wastewater/Onsite	ТВА	Fee
August 5	Hazardous Communication Standard (Global Harmonization)	Bend	0.3 Water/Wastewater	4193	Fee
August 5	Confined Space	Bend	0.3 Water/Wastewater/Onsite	3841	Fee
August 10-11	Wastewater Treatment/Collections Certification Review	Salem	1.4 Wastewater/0.7 Water	4227	Fee
August 23	Effective Utility Management	Seaside	0.6 Water/Wastewater	TBA	FREE
August 23-26	27 ^m Annual Summer Classic Conference	Seaside	2.3 Water/Wastewater	TBA	Fee

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Training class dates, class topic and/or locations may be subject to change as needed.

For more information on any class by OAWU, please contact the office at 503-837-1212, office@oawu.net or visit www.oawu.net.

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A.	5 feet	C.	8 feet
B.	12 feet	D.	11 feet

- 2. Find the upward force on the bottom of an empty tank caused by a groundwater depth of 4 feet. The tank has a radius of 16 feet.
 - A. 322,067 pounds
 C. 137,648 pounds

 B. 200,638 pounds
 D. 223,769 pounds
- A flow of 825 gpm is pumped against a total head of 430 feet by a pump with an efficiency of 55% and a motor with an efficiency of 85%. What is the total horsepower?
 A. 192 HP
 B. 105 HP
 C. 163 HP
 D. 87 HP
- 4. Given the following data, how many lbs/day of centrate will this centrifuge produce?
 - Sludge feed rate is 250gpm
 - Sludge feed solids concentration is 1.5 % TS
 - Centrate is 95% of sludge feed rate
 - Centrate solids content is 50mg/L
 - Centrifuge operating time is 16 hrs/day
 - A. 150 lbs/day
 - B. 143 lbs/day
- C. 45,036 lbs/day
- D. 95 lbs/day

- 5. How many Cubic Feet/Second is 1 MGD?
 - A. 1.55 cfs C. 13 cfs
 - B. 3.0 gps D. 2.5 cfs
- 6. Water heaters, hose bibs and sill cocks are normally protected from backflow with _____.
 - A. An air gap
 - B. An air break
 - C. A vacuum breaker
 - D. A reduced-pressure backflow preventer
- 7. What is the total pressure in pound per square inch (psi) on a 6 inch diameter test plug with a water head of 15 feet?
 - A. 3.00 psiC. 6.51 psiB. 4.25 psiD. 7.20 psi
- 8. What could happen if the backwash rate is too high? A. Cavitation
 - B. Mudball formation
 - C. Excessive loss of filter media
 - D. Increase in head loss in the filter after backwashing has finished

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