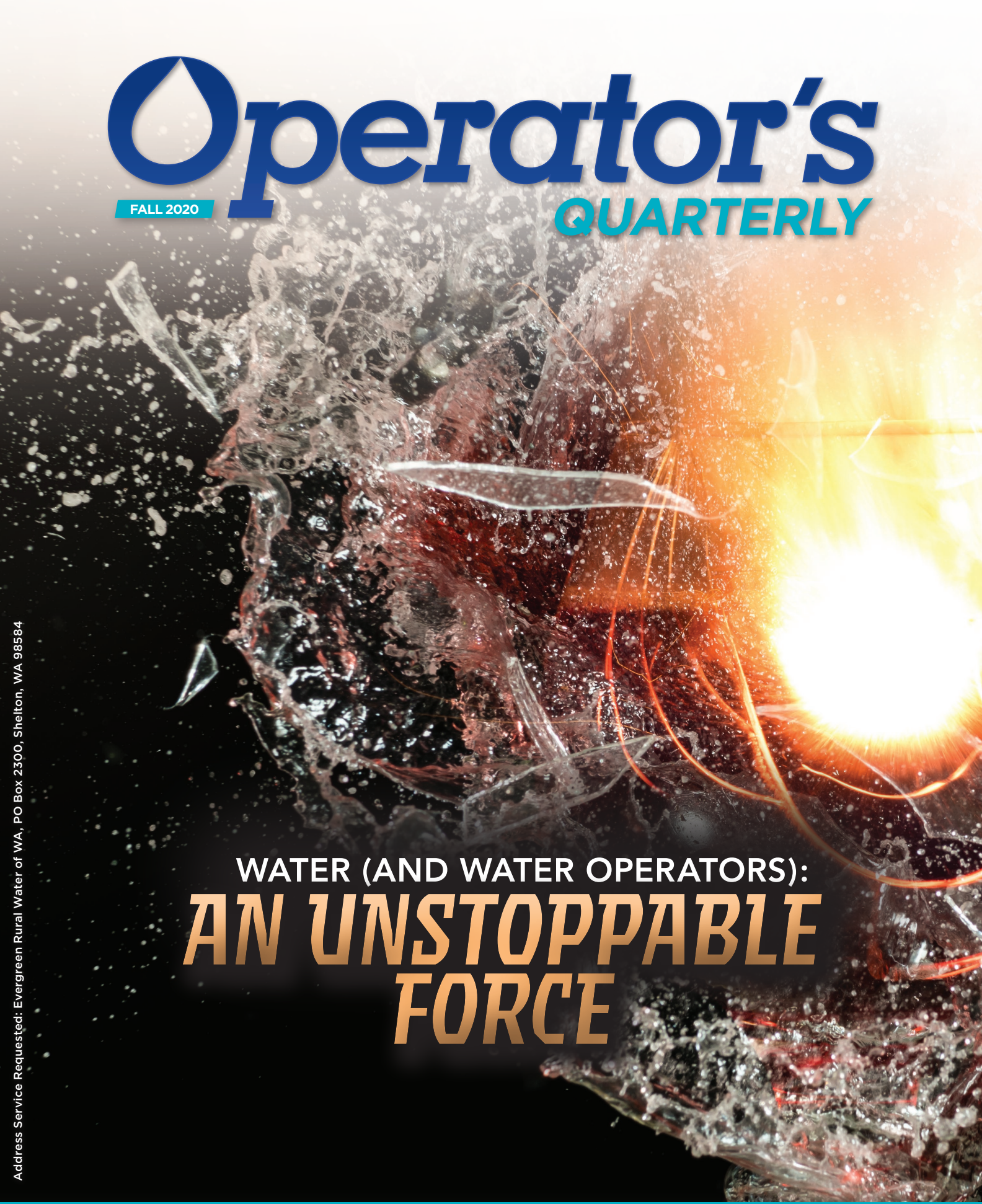
Operator's QUARTERLY

FALL 2020



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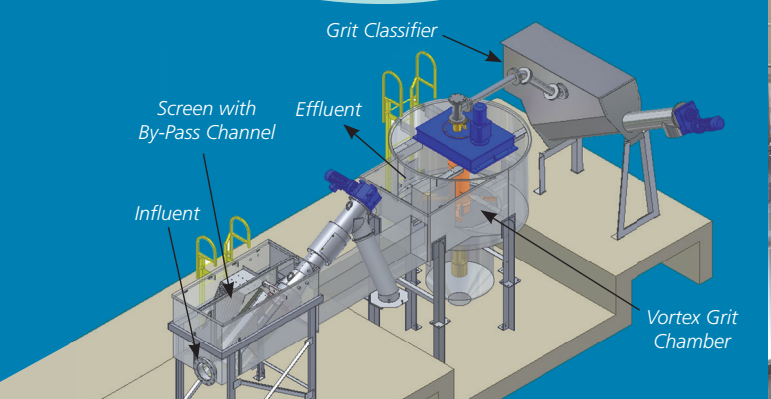

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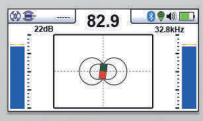

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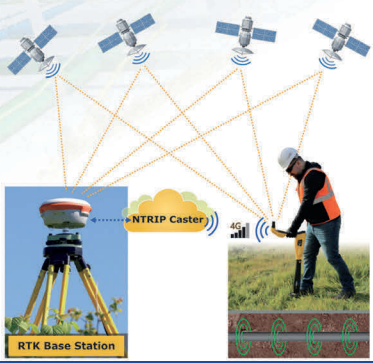

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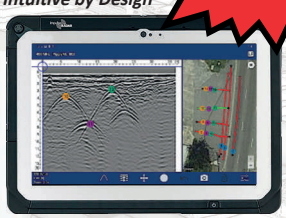

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Operator's QUARTERLY

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***OPERATOR'S QUARTERLY* IS PUBLISHED BY:**

Craig Kelman & Associates

Tel: 866-985-9780 **Fax:** 866-985-9799
www.kelmanonline.com

Managing Editor: Megan Funnell
Design/layout: Dia Chea
Marketing Manager: Darrell Harris
Advertising Coordinator: Stefanie Hagidiakow

Contents

> **"In the complicated word of water and wastewater, none of us has all the answers to questions or options for solutions when it comes to issues we've encountered; however, our team at the Evergreen Rural Water of Washington (ERWoW) and the operators make a difference."**

FEATURE

DEPARTMENTS

Nothing Can Stop Us

BY TRACEY HUNTER, EXECUTIVE DIRECTOR

Our industry doesn't stop for anything. *Hurricanes*, we work. *Fires*, we work. *Wind* and *snowstorms*, we work. *COVID-19*, we work. Guess what else doesn't stop for anything? Continuing education.

Currently, all of the certified operators in water and wastewater are sitting half way through the CEU period. The three-year period runs until December 2021, so there is still plenty of time to get your CEUs. Since April, we have been offering online training classes and will continue to do so. I understand that not everyone is comfortable with online learning – or you may not have a strong Internet connection where you are – so online classes are not an option. Please know that we want to be back in the classroom but plan to wait until it is safe to do so; as soon as we can, we will.

At the end of August, we hosted our first virtual conference. Not to toot our own horn but it was pretty great! Kari and I had a lot of stress the week before the conference. This isn't new – we are usually fairly panicked the week before a conference, making sure we have everything, all speakers have confirmed, etc. – however, this conference (being virtual) had more unknowns. Luckily for us, we did not have any major problems. Can we improve? Of course. Will we improve if we have to do this again? Yes, but all-in-all it was fun, fantastic and attendees had the opportunity to earn up to 1.2 CEUs.

Our mission is *"To provide the best technical assistance, training and advocacy for Washington State Water & Wastewater Utilities."* Throughout the last six months, we tried our best to adapt to this ever-changing world and continue to provide training to the utilities of Washington State. We thank you for your support and your trust in getting quality training to you – no matter what is going on around us.

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Water Shut-offs During COVID-19

During the governor's emergency proclamation, water utilities cannot shut off non-paying customers and (prior to this order) are required to turn the water on to non-paying customers. If systems are shutting water off for non-payment during this time – they don't think that this applies to them – you might want to do some research in order to avoid any costly fines.

It has been brought to my attention that several small systems are struggling to make ends meet. So what can be done to help systems relieve some of the financial burden that is being created by non-paying customers? You can keep in close contact with these individuals and remind them that the bill still has to be paid or set up a reduced payment schedule for them. Receiving some money is better than nothing – and it will help the customer when the proclamation is over. At this point, it is unclear to me if the customers will have to pay the bill or if the government will put forward a relief package; encourage them to reach out to non-profit organizations for help. All systems should keep records of all revenue lost.

Lastly, check out the Department of Health website (*www.doh.wa.gov*) – it contains useful information for setting up a customer assistance program that some systems are required to do. They also have links to other organizations that offer resources.

I hope this helps!

DAVID KEKSI
Southern Region Circuit Rider
Evergreen Rural Water of Washington

Sustainable Solutions

In the complicated word of water and wastewater, none of us has all the answers to questions or options for solutions when it comes to issues we've encountered; however, our team at the Evergreen Rural Water of Washington (ERWoW) and the operators make a difference.

One day, operators are working with a system that has 1,600 connections, several reservoirs, pump stations, elevation changes and water sources. The next, working at a simple one well and reservoir system. No matter the type of system or plant, there are always treatment and operation issues that are unique to each.

What type of disinfection do you use? What is the best equipment to apply it? What about by-products and waste, operational power? Each of these questions could apply to Asset Management or Maintenance Management; you are not alone in dealing with these issues.

One of the biggest issues is economical changes after being shut down, due to COVID-19 – in particular, disinfection by-products and pumping. For example, operators are trying to determine the best cost-effective way to remove total trihalomethanes (TTHMs) from systems. So far, research shows that aeration is best. There are many ways to accomplish the procedure when added to a flushing routine. Then take the issue of pumping – there is a lot to talk about there; more than what we have time for right now.

ERWoW offers sustainable solutions for you, the operators. We help you in every way possible – through the different programs we have in place to help you find the best solutions for any issue. There are several techniques to mix a tank and cause aeration. The Energy Efficiency Program is a good place to start because it is a great planning tool. Sometimes a minor tweak in the system or operation is all that is needed.

Give us a call: we can help.

LYNN STUART
Energy Efficiency Circuit Rider
Evergreen Rural Water of Washington

Conducting a Source Water Well/Pump Test

Source water wells are the most important component of a water system. Wells are recharged by the hydrological cycle of evapotranspiration, snow and rainfall, and percolation back into the ground for resupplying the water bearing strata (aquafers).

Each well should have drilling logs, produced by well drillers, for well tests.

Licensed well drillers should perform a minimum four-hour well drilling test, recording:

1. Static water level and pumping water level.
   a. The difference between the static and pumping level is called *drawdown.*
2. The drawdown should be limited to approximately three feet above the suction screen on the submersible test pump and the production of the well should run at minimum four hours with the production monitored and recorded every 15 to 30 minutes.
3. After the acceptable time of production testing, the recovery rate should be recorded.
   a. This is typically performed by measuring a distance on the level monitoring line, shutting off the pump, and recording the time to recover the marked distance.
   b. The drop pipe should have a check valve installed near the pump; when the pump is shut off, the returning water in the drop pipe is not mistakenly recorded as aquifer recovery rate.

As a tool to monitor the performance of your well and aquifer, a quarter poly line should be attached to the drop pipe and a pressure gage and schrader valve (airline) are available to consistently monitor the data.

The Department of Health (DOH) has a three-page graphically illustrated publication that is helpful. To access this publication, visit *www.doh.wa.gov/portals/1/Documents/pubs/331-428.pdf.*

It is important to measure the water level in your wells on a regular basis. Doing so will allow you to identify and diagnose well-production issues long before they cause serious problems, such as water outages and pump damage. State drinking water rules require all water systems to maintain records of static well-water levels on a seasonal basis, including low demand and high demand periods (WAC 246-290-415(9)).

WAYS TO MEASURE THE WATER LEVEL AIR LINE DEVICE

Set a known length of small-diameter tubing down the well until at a minimum of 10 feet is submerged in the water. The tubing must be straight; most engineers strap it to the pump discharge pipe. Connect a pressure gauge to the tubing at the wellhead and pump air into the line until you achieve maximum pressure. Use the pressure gauge reading to determine the length – from the water level to the bottom of the tubing. Subtract this length from the total length of the airline to determine the distance from the wellhead to the water level. If the gauge is calibrated in feet, it will directly indicate the distance from the water level to the end of the airline. If the gauge reads in pounds per square inch (psi), convert the reading to feet by using the formula 1 psi = 2.31 feet.

Example: If the open end of an installed air tube is 300 feet below the top of the well casing and the pressure gauge reads 38 psi, the water level depth would be 213 feet below the top of the well casing.

ELECTRIC WATER LEVEL PROBES ELECTRIC

Water level probes consist of a spool of dual conductor wire, a probe attached to the end and an indicator. When the probe contacts the water, the circuit closes and a meter light or audible buzzer attached to the spool signals contact. Read the depth from graduated markings on the wire.

Remember to:

- Disinfect the measuring device with a dilute chlorine bleach solution before using it to prevent contaminating your well. Make sure the instrument is working by dipping the probe into a bucket of clean water.
- Slowly lower the probe down the well casing. If the probe gets caught up on wires, pipes or other material in the well, pull back and try again. You may need to try several times before finding a free path down to the water.

One final thought: water rights, the health of adequate supply, and the impacts of proliferations of the supply aquafer are all dependent on monitored and recorded data on each well.

FRANK WRIGHT
Source Water
Evergreen Rural Water of Washington

Waterborne Disease Outbreaks Disassembled: Cholera

> **One of the more famous outbreaks occurred in the early 1830s, when London, England had a dense population due to the industrial revolution. Sewage systems consisted of open drains, loaded with raw sewage, that flowed down cobblestone pavers.**

Local hospitals are unable to keep up with the volume of new patients and businesses and restaurants are shut down; nobody is exempt. From politicians to clergy, everyone is at risk. People are taking shelter at home in fear or venturing out and taking the risk of becoming the next victim. No, I am not speaking about COVID-19 – although it is having a similar effect. This is Cholera.

Did you know that between 28,000 and 124,000 people die every year from Cholera? Although rare in the States, Cholera is persistent in countries with poor water treatment and effluvium systems. Cholera may kill in hours, if left untreated, and around 150,000 cases are reported by the World Health Organization each year (thanks CDC 2018). Cholera is highly infectious and can be transmitted by poor hygiene techniques, eating contaminated food, or drinking contaminated water. Once ingested, common symptoms are watery diarrhea, dehydration, muscle cramps, excessive thirst, rapid heart rate, and low blood pressure.

One of the more famous outbreaks occurred in the early 1830s, when London, England had a dense population due to the industrial revolution. Sewage systems consisted of open drains, loaded with raw sewage, that flowed down cobblestone pavers. Animal dung, rubbish and the slops were thrown out of the houses to join the effluent. The worst of the filth would be removed by 'rakers,' whose job it was to remove the worst 'pile ups' to outside the city walls – where it sat and festered, generating an enormous stench (now that's a dirty job).

These slums were breeding grounds for disease, so of course there was an outbreak, however, people did not know how to treat it. Some exclaimed it was evil spirits or an abundance of sin in the household that made it manifest; others claimed it was bad air causing huge bonfires to be lit in the hope the air would be cleansed. People thought tobacco was a cure because no tobacconist had died from the plague (that they knew of) and wore a flannel or woolen belt around their stomach – supposedly to choke off bowel movements.

During this time, Dr. John Snow (father of modern epidemiology), who had previously gained fame administering chloroform to Queen Victoria, was charged with ascertaining the cause of the Cholera epidemic. During his investigation, he noted the two water suppliers had quite different sources. The Lambeth Company had a water source that was free from the sewage of London, but the Southwark and Vauxhall Company had sources (close to London) effluent; however, there were areas in London that were served by both so this was inconclusive – until the Broad Street Pump incident.

Dr. Snow wrote, "On the night of August 31st, the most terrible outbreak of Cholera which ever occurred in the kingdom" broke out. Since he lived in the nearby area, Dr. Snow went right to work. He reviewed a sample of water under the microscope and noted, "white flocculent particles," then created a chart that mapped out where victims were located and whether they consumed water from the Broad Street pump. His work paid off: Dr. Snow was able to prove that an overwhelming amount of the victims drank water from this source. With this information in-hand, Dr. Snow went to the local authorities and convinced them to remove the handle from the water pump – making it impossible to draw water. When this happened, the outbreak dramatically stopped with the death toll standing at 616.

It was later found a child, living at number 40 Broad Street, became ill with Cholera symptoms; its diaper had been cleaned in water that was dumped into a cesspool only three feet from the Broad Street well.

Another thing of note was there were 530 inmates at the Poland Street workhouse, located around the corner from Broad Street, and only five people had contracted Cholera. No one from the workhouse drank the pump water since the building had its own well. Among the 70 workers in a Broad Street brewery, where the men were given an allowance of free beer every day, there were no fatalities at all (so, feel free to draw your own conclusions).

In 1834, German physician and microbiologist Robert Koch determined the agent of Cholera was Vibrio Cholerae. A vaccine was developed in July 1892. Today, treatment will consist of antibiotics and intravenous fluids. Of course, your best bet is prevention with practicing personal hygiene (washing your hands with hot soapy water, watching for cuts on your skin, and cleaning and disinfecting personal areas with a bleach solution), washing fruits and veggies before eating them, and keeping your immune system ready by eating healthy and getting a good night's sleep.

JOE BARBEE
Northern Region Circuit Rider
Evergreen Rural Water
of Washington

National Wastewater Surveillance System (NWSS)

A new public health tool to understand COVID-19 spread in a community

In an effort to provide clear, concise, accurate information, I have pasted below the most relevant and current information according to the CDC guidelines, per the www.cdc.gov website.

Full credit and reference for the attached article is given to: www.cdc.gov/coronavirus/2019-ncov/cases-updates/wastewater-surveillance.html

The Centers for Disease Control and Prevention (CDC) and the U.S. Department of Health and Human Services (HHS), in collaboration with agencies throughout the federal government, are initiating the National Wastewater Surveillance System (NWSS) in response to the COVID-19 pandemic. The data generated by NWSS will help public health officials to better understand the extent of COVID-19 infections in communities.

CDC is currently developing a portal for state, tribal, local, and territorial health departments to submit wastewater testing data into a national database for use in summarizing and interpreting data for public health action. Participation in a national database will ensure data comparability across jurisdictions.

Data from wastewater testing is not meant to replace existing COVID-19 surveillance systems, but is meant to complement them by providing:

- An efficient pooled community sample.
- Data for communities where timely COVID-19 clinical testing is underutilized or unavailable.
- Data at the sub-county level.

What is wastewater surveillance for COVID-19?

'Wastewater,' also referred to as 'sewage,' includes water from household/building use (i.e., toilets, showers, sinks) that can contain human fecal waste, as well as water from non-household sources (i.e., rainwater and industrial use.)

- Wastewater can be tested for RNA from SARS-CoV-2, the virus that causes COVID-19.
- While SARS-CoV-2 can be shed in the feces of individuals with COVID-19, there is no information to date that anyone has become sick with COVID-19 because of direct exposure to treated or untreated wastewater.

What are the advantages of wastewater infectious disease surveillance?

- Sewage testing has been successfully used as a method for early detection of other diseases, such as polio.
- SARS-CoV-2 can be shed in the feces of individuals with symptomatic or asymptomatic infection; therefore, wastewater surveillance can capture data on both types of infection.
- Nearly 80% of United States households are served by municipal sewage collection systems.
- Quantitative SARS-CoV-2 measurements in untreated sewage can provide information on changes in total COVID-19 infection in the community contributing to that wastewater treatment plant (that area is known as the 'sewershed').
- Depending on the frequency of testing, sewage surveillance can be a leading indicator of changes in COVID-19 burden in a community.
- SARS-CoV-2 RNA detection in sewage serves as a COVID-19 indicator that is independent of healthcare-seeking behaviors and access to clinical testing.

Is wastewater surveillance right for my community?

Wastewater surveillance for RNA of the virus that causes COVID-19 is a developing field. Health departments setting up a sewage-based infectious disease surveillance system should consider the following to generate data that is useful for public health response:

- Sewage testing over time can provide trend data that can complement other surveillance data that informs public health decision-making; however, at this time, it is not possible to reliably and accurately predict the number of infected individuals in a community based on sewage testing.
- Community-level wastewater surveillance at a treatment plant will not capture homes on a septic-based system.
- Community-level wastewater surveillance at a wastewater treatment plant also will not capture communities or facilities served by decentralized systems, such as prisons, universities, or hospitals that treat their waste.
- Low levels of infection in a community may not be captured by sewage surveillance. The lower limits of detection (i.e., the smallest number of people shedding the virus in stool that can still be detected by current testing methods) for sewage surveillance are not yet well understood. More data on fecal shedding by infected individuals over the course of disease are needed to better understand the limits of detection.
- All wastewater treatment plants may not be appropriate as sites for surveillance given their operations logistics (e.g., if sewage is pre-treated before it reaches the plant).

How do I become engaged in NWSS?
Using wastewater surveillance for public health action requires a multidisciplinary approach. Communities interested in conducting wastewater surveillance for COVID-19 should identify the necessary local partners for sample collection, testing, and public health action. Local partners should include:

- State, local, tribal, and territorial health departments – COVID-19 epidemiologists, environmental health epidemiologists, and laboratory scientists.
- Wastewater treatment plants, workers, and worker representatives (e.g., unions).
- Laboratories – public health, environmental, academic, and/or private (Note: CDC is not currently accepting sewage samples for testing).

National Wastewater Surveillance System (NWSS) is currently ramping-up efforts through partnerships with state, local, tribal, and territorial health departments. Additional information, including sampling, testing, and interpretation guidance, minimum reporting requirements, and instructions for reporting through the data portal will be updated on this page as they become available.

For further information please visit *www.cdc.gov/coronavirus/2019-ncov/cases-updates/wastewater-surveillance.html.*

CHAD SHORT
Eastern Region Wastewater Technician
Evergreen Rural Water of Washington

Times Are Changing

In the late 1970s, during my college classes for Water and Wastewater Treatment, most students believed people wanted and understood the need to protect precious water resources. I was looking forward to completing my classes and getting a job. Classes were full and we were going to be the next generation to provide clean drinking water and tidy up the waterways of the United States. With the beginning of the EPA, we would have the cleanest water in our streams and drinking water.

Year's prior, I went fishing with my Grandpa on Lake Erie; the water was a natural dark green color, then we drifted into water that was orange – as bright as the fruit. He had no idea what was in the water. We were behind the Bethlehem Steel Plant and could see waste being dumped into the Lake. I started thinking this is bad; I did not want to eat the fish we were catching. Even then, I believed we should want to make things better for the environment.

Fifty years later, we are here and, according to the EPA, one-half of the rivers in the USA are polluted and over two million people don't have access to clean, healthy drinking water. Meanwhile, new contaminates continue to be found in our drinking water. Yearly, over 3,000 new chemicals are developed for industry and the effects on humans are not yet known.

Why? There are several reasons. The USA has not kept up with infrastructure replacements, maintenance has been deferred, and operators are expected to do more with less; meanwhile, industry continues to pollute and delay clean-up efforts.

Currently, a notable number of operators are retiring and it is becoming difficult to find qualified people to replace them. In the USA, there are 148,000 water systems. It is estimated that over the next 10-year period, over 50% of the total water operator positions will need to be filled. I have worked with two water systems that had no one on-staff, who was trained to run the operations, when the current operators had to leave unexpectantly.

I urge operators to talk to young people and express the importance of the water operator profession and to get started right away with training. I like to point out the stability of the position as well as the salary, hours, and benefits. Being an operator isn't a get-rich-fast job but is a good paying career that is stable with potential for moving up the ladder. If you know anyone who is interested in getting in this field and working as an apprentice, you can contact Ernie Klimek, our Apprenticeship Supervisor at Evergreen Rural Water, at *eklimek@erwow.org.*

RAY SLED
EPA Training Specialist
Evergreen Rural Water of Washington

Instructing in this COVID Environment

By now, you should all be used to online links to classes, network difficulties, where your camera and audio buttons are ('you're still muted'), and other nuances we deal with in this COVID training environment. There is even a bingo card, with all the miscues listed on it, to play along at home. Whether it is GoToMeeting, GoToWebinar, Zoom or Zoom Webinar, I think you've seen them all.

Raising your hand, communicating and asking questions are our way of getting you your CEUs; is there a living body on the other side of that camera? Some classes are conducive to this format; others (that are hands on) are not. Meanwhile, some operators like the fact they can get their training from the home or office, without travel expenses, and others miss the interaction with fellow operators and friends.

We miss the 'old timey' networking that human interaction brings. I've even thought about opening up some of our sessions so we could get together, network and talk about what's happening in your world. This is important and that's what we miss.

Technology is a double-edged sword. We can do so much with it but, at the same time, we isolate ourselves to a few pixels on a screen. Our class interactions are now like watching the Brady Bunch opening (yes, I dated myself with that statement). We need to make sure that we don't get stuck in that pixel box. As long as you social distance and wear the proper PPE, you can interact at a more personal level. This use of technology for virtual or remote training won't be going away but rest assured, as soon as it is safely possible, we will be getting back on track in the real classroom. Class sizes may be smaller and some interaction may be limited but you can never replace that experience with a virtual classroom.

We need to do our best with the cards we're given. That's old school for us as operators. As the saying goes, "We've been doing so much with so little for so long that now we can do anything with nothing!" Keep that in mind as you go about your COVID world. You are an essential worker, an unsung hero. Every day for us, the world keeps turning and the water and wastewater keeps flowing; it's our job to treat and keep it moving. We do that with a well-educated and certified work force. Now we are providing that to you in the virtual/remote world and have adapted to the changes required to meet the need. That being said I want to thank all of the essential workers and remind you to stay safe.

We'll be seeing you in the (virtual/remote) classroom (for now).

ERNIE KLIMEK
Training/Apprenticeship Supervisor
Evergreen Rural Water of Washington

We're Here to Help

Evergreen Rural Water's Wastewater Technicians and Water Circuit Riders are here to assist on many things that small systems do in their day-to-day work. They can help with your labs, reports, maintenance, and equipment fails. Does your system have the funds to just call a contractor to do the repairs? Reach out to the Evergreen Rural Water of Washington (ERWoW) first to see if their team can help you and save your system money.

I have visited systems that didn't have a large crew or enough knowledge to do everything that's needed and there's nothing wrong with that. We are here to help with many things. I have assisted systems on SOMAT screen and brush replacement, influent screen basket, brush and ware plates replacement, pump replacements, lift station repairs and other projects.

If you are unsure of who we are or whom is available in your area, please visit *www.erwow.org* – the 'Contact Us' page lists our cell phone numbers and email addresses. Please contact us and know that we're here to assist you with any problems or answer any questions you may have.

We all have years of experience and have been in your position as an operator.

LOREN STEVENSON
Western Region Wastewater Technician
Evergreen Rural Water of Washington

No Operator Left Behind

By the staff of Backflow Management, Inc.

As we slide into the sixth month of our new normal, how are you affected as a water operator? Has it affected your health, your family's health or your 'job,' as the caretaker of public health?

COVID, to the best of our knowledge, is not a waterborne disease; however, good hygiene is a key part of keeping ourselves (and those around us) safe. Staying healthy is only half the battle. As water operators, we not only have a priceless role in providing clean, safe, and adequate drinking water to our communities but we must also maintain our certifications. COVID has impacted us all, directly or otherwise, in a vast number of ways. Recently, we received a letter from the Department of Health (DOH), informing us we will still be responsible for getting all of our CEUs by the end 2021. So, is your house in order and relevant to your knowledge, CEUs, etc.?

Although most in-person conferences, seminars and classes have been canceled, there are many opportunities available online. As a company that has attended and hosted online events, we understand the challenges associated with the use of online training tools. The good news is that online learning opens many doors for the advancement of knowledge. Once anyone is familiar with software, catered to simplicity, it is possible to sit on your couch, in your PJs, and be ready to learn any topic – including those that increase knowledge for water operators.

There are significant advantages with online training. Students and instructors can answer questions that could typically go unanswered; however, when taking advantage of these new opportunities, it is important to engage effectively. When using online sources, make sure the content is credible. When listening to your instructor, engage in conversation, take good notes and always participate. The transition to online training will always be in effect, to a certain degree, so strive to understand and participate in the training that's being offered. It is literally at your fingertips.

Reach out to the Evergreen Rural Water of Washington (ERWoW) circuit riders for assistance and the instructors for guidance on how to maneuver through this new territory. Remember, it is electronic so you may get 'bounced out,' lose audio, etc. – it is just all part of the 'new normal.' Your community depends on you – that has not changed – so remember to treat your water users with kindness and patience: their fear levels have been elevated. You will always be the caretaker of our most precious commodity and an essential worker for public health. Stay safe and become familiar with the tools available to assist you in becoming the best you can be.

There are significant advantages with online training. Students and instructors can answer questions that could typically go unanswered; however, when taking advantage of these new opportunities, it is important to engage effectively.

Our concern for the environment
is more than just talk

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BE DISASTER RESILIENT AND READY

By Karen Edwards-Lindsey, *edwards-lindsey.karen@epa.gov*, 202-564-3797
U.S. Environmental Protection Agency, Office of Water, Water Security Division
1200 Pennsylvania Ave, NW (4608T) Washington, D.C. 20460

Water utilities today face unprecedented threats to the security and resilience of their systems. In Washington, drinking water services can be susceptible to natural disasters such as wildfires, floods, landslides, and severe storms. When disasters occur, they carry a risk of endangering people, property, and critical infrastructure. In these instances, rural water systems serve as a critical lifeline for public health and the community at large. While any natural disaster can be overwhelming, you can take steps to prepare your utility and community in advance.

AMERICA'S WATER INFRASTRUCTURE ACT – SECTION 2013 REQUIREMENTS

One of the first steps is to conduct a detailed assessment of your risks. If you have not completed or updated your risk assessment already, you may be required to do so under the America's Water Infrastructure Act (AWIA). Section 2013 of the Act requires Community (drinking) Water Systems (CWSs) serving more than 3,300 people to develop or update a Risk and Resilience Assessment (RA) and Emergency Response Plan (ERP). The law includes the components that the RAs and ERPs must address and establishes deadlines by which water systems must send a certification of completion to the United States Environmental Protection Agency (U.S. EPA).

The certification deadlines are based on system population size reflected in the Safe Drinking Water Information System (SDWIS) as of the law's date of enactment on October 23, 2018. Systems serving a population 100,000 or greater were required to certify completion of the Risk and Resilience Assessment no later than March 31, 2020. Systems serving population sizes of 50,000 to 99,999 must certify completion no later than December 31, 2020, and systems serving populations of 3,301 to 49,999 must certify no later than June 30, 2021.

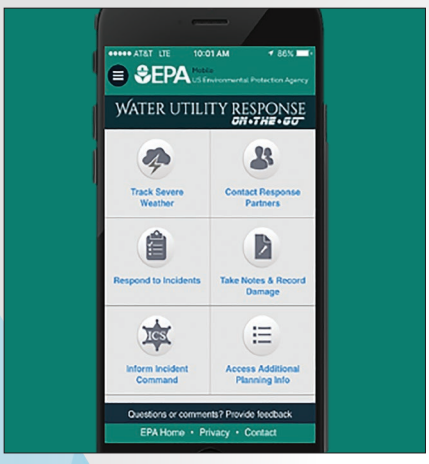
Within six months of certifying completion of the Risk and Resilience Assessment, water systems must also certify completion of the ERP. AWIA requires systems to consider factors such as monitoring practices, financial systems, chemical storage, and operations and maintenance in their RAs. For the ERP, AWIA requires utilities to include items such as strategies and resources to improve resilience and procedures to lessen the impact of malevolent acts or natural hazards. See the following webpage for more information and details about AWIA (*www.epa.gov/waterresilience/americas-water-infrastructure-act-risk-assessments-and-emergency-response-plans*).

AWIA COMPLIANCE RESOURCES

The U.S. EPA has developed a suite of tools to help you comply with AWIA. The first tool is the Vulnerability Self-Assessment Tool (VSAT) Web 2.0. This tool is a risk assessment application for water, wastewater, and combined utilities of all sizes. Using VSAT Web 2.0, water systems in Washington can assess their vulnerabilities to both man-made and natural hazards and evaluate potential improvement opportunities to enhance their security and resilience. See *www.epa.gov/waterriskassessment/conduct-drinking-water-or-wastewater-utility-risk-assessment*. Small CWSs serving greater than 3,300 but less than 50,000 people can conduct a RA using the Small System Risk and Resilience Assessment Checklist (*www.epa.gov/waterresilience/small-system-risk-and-resilience-assessment-checklist*). CWSs serving 3,300 or fewer people are not required to conduct risk and resilience assessments under AWIA. EPA recommends, however, that very small CWSs use the checklist or other guidance to learn how to conduct risk and resilience assessments and address threats from malevolent acts and natural hazards that threaten safe drinking water.

A second resource developed to help CWSs conduct a RA is the Baseline Information on Malevolent Acts for Community Water Systems. This document assists CWSs in identifying the types of malevolent acts that could impact them and assist with estimating the threat likelihood of such acts (*www.epa.gov/waterriskassessment/baseline-information-malevolent-acts-community-water-systems*).

The U.S. EPA also developed a resource to help CWSs comply with the AWIA ERP requirement. The ERP Template and Instructions describe strategies, resources, plans, and procedures utilities can use to prepare for and respond to



an incident, natural or man-made, that could disrupt essential water services. The resource features a blank ERP template that can be easily accessed and modified by utility personnel to meet their own water system needs (*www.epa.gov/waterutilityresponse/develop-or-update-drinking-water-utility-emergency-response-plan*).

OTHER RESOURCES

After completing an RA and ERP, utilities can further explore how to lower risks and increase efficiency of response with U.S. EPA's tools and resources. **The Flood Resilience Guide** provides practical solutions to help drinking water and wastewater utilities become more resilient to flooding. The guide is particularly useful for small and medium-size utilities in Washington and includes resources to assist utilities in examing the threat of flooding, determining the impact to utility assets and identifying cost-effective mitigation options.

The **Water Utility Response On-The-Go (Response OTG)** Application is an interactive tool allowing you to respond in real time from the field, track severe weather, contact response partners, identify actions to take and inform incident command. You can learn more about both tools at *www.epa.gov/waterutilityresponse*.

The U.S. EPA provides regular updates on water security and resilience resources that will help water systems meet their requirements to comply with AWIA. To learn more, visit *www.epa.gov/waterresilience* or join the What's Going On newsletter email list by contacting *wsd-outreach@epa.gov*. With the help of the additional free water resilience resources, you can continue working toward providing safe and reliable services to customers during emergencies.

Racing Against Time:
HOW SEWERS ARE TRACKING COVID-19

By Amy Anderson, Goldie Associates; David Ladner, Clemson University; and Robert Osborne, Black & Veatch

When you think of tracking the prevalence and spread of the novel coronavirus disease, COVID-19, you imagine labs testing individual nasal swabs, but an unlikely star is emerging as a powerful tool to track the spread of this new disease: wastewater. Researchers can analyze a community's wastewater to detect viral particles excreted by individuals infected with COVID-19. Data suggests that an infected person will excrete into wastewater millions, if not billions of viral genomes each day. These viral particles can then survive two to four days as they travel through the wastewater system.

Detecting the novel coronavirus in wastewater can be one of the earliest indications of the virus's spread in a community. The virus can start being released as early as the third day of infection, even before any symptoms develop. Analyzing the virus in wastewater also provides a way to detect

Photo of Dr. Norman's research team in special blue suits
Dr. Sean Norman and his research team at work analyzing wastewater samples for coronavirus.

infections in those who are asymptomatic or only experience mild symptoms and would not otherwise seek testing. As revolutionary as this technique may seem, using wastewater to detect viruses at a community level has been used for over three decades, first to track polio incidence and since then for norovirus.

In a recent episode of The Outfall podcast, we talked to two pioneering researchers about the unique advantages of using wastewater as an epidemiological tool and how South Carolina is taking a leading role. Dr. Sean Norman, an associate professor in the Department of Environmental Health Sciences at the University of South Carolina has spent the last 10 years tracking antibiotic resistant bacteria through wastewater treatment plants. However, Dr. Norman received a call from the Centers for Disease Control and Prevention earlier this year that caused him to shift his lab focus to the novel coronavirus and its presence in wastewater.

"If you can't go in and individually test an entire population of people, there's really not necessarily a better way than using sewage because a sewer shed is collecting the information from a population of people throughout a community," explained Dr. Norman. By collecting this viral information, researchers can develop predictive models and alert health officials to new outbreaks, often even before individuals would know that they were infected. This means policymakers, public health officials, and healthcare workers could have an early warning system and be prepared for a new disease surge.

Over 2,000 miles away from Dr. Norman's lab, Dr. Ian Pepper, an environmental microbiologist at the University of Arizona, has been analyzing samples from 15 different wastewater treatment plants from across the country. He has been collecting two samples a week from a wastewater treatment plant in Tucson. Over this time, Dr. Pepper has been able to track changes in the concentration of the virus and sees immense public health potential from this wastewater tool. Dr. Pepper explains that the presence of coronavirus in sewage is a leading indicator of pandemics as opposed to death, which is the lagging indicator. The intelligence that wastewater can provide gives health officials invaluable time to prepare a response and potentially save lives.

Closer to home, Dr. Norman is also analyzing a number of wastewater treatment plants. He is sampling approximately eight plants in South Carolina, two in Texas, and one in California. In less than 24 hours, Dr. Norman can detect the amount of the novel coronavirus in an entire community's wastewater. Dr. Norman explains that a sample of wastewater gives a unique snapshot of that community. Understanding the variables that affect that snapshot are important, such as total suspended solids and the percentage of residential versus industrial influence. Once these variables are accounted for, models can be developed to understand the percentage of the population infected by the virus.

"I'm most curious about seeing if we can adapt this into a model to be able to ***assess the true percentage of the population that's infected by the virus.*** *That to me is the golden ticket for the work that we're doing. If we can do that, then we can make it a predictive model; then it becomes an applied public health tool that might be able to be adopted by policymakers."* – Dr. Sean Norman

Since this episode was produced, many more utilities, cities, and even universities across the state have begun monitoring their wastewater for the novel coronavirus. Researchers are sampling, analyzing, and dialing in on the right information to turn this data into models that can become a frontline public health tool. We are following this research closely and are excited to produce more episodes to follow up on how this viral epidemiology is aiding the COVID-19 response.

AWIA COMPLIANCE

Risk and Resilience: What You Need to Know and Where to Find Resources

Passed in 2018, *America's Water Infrastructure Act* (AWIA) requires community water systems to file a 'risk and resilience' assessment with the EPA. Within six months of the assessment, water systems must develop an emergency response plan. Links to the process, certification requirements, and resources can be found at *www.epa.gov/waterresilience/americas-water-infrastructure-act-risk-assessments-and-emergency-response-plans.*

Who Must File a Risk and Resilience Assessment?

Any community water system that serves more than 3,300 persons is required to file an assessment and emergency response plan. While a community water system is defined as any drinking water utility that consistently serves at least 25 people or has 15 service connections year-round, only those serving 3,300 people are impacted by this requirement.

When Do I Need to File?

The due dates for both the assessments and the plan are dependent upon the size of your service population.

Service Population	Risk and Resilience Assessment	Emergency Response Plan
≥ 100,000 people	March 31, 2020	September 30, 2020
Serving ≥ 50,000 and ≤ 99,999	December 31, 2020	June 30, 2021
Serving ≥ 3,301 and ≤ 49,999	June 30, 2021	December 30, 2021

Continuing Requirements

Every five years, your utility must review your risk and resilience assessment and adjust if needed. You then must recertify your assessment with the EPA. Within six months of recertification of your risk and resilience assessment, you must review your emergency response plan and revise if necessary.

Is There a Form or a Standard I Must Follow?

The short answer is no. Your utility's assessment and plan must meet all the criteria in AWIA Section 2013(a) and (b), but the AWIA does not require that you use any particular standard, tool or method for conducting your assessment or developing your plan. Please be aware that your risk assessment and emergency response plan need to include assessments accidental emergencies (chemical leaks, equipment malfunctions), natural disasters, and changing conditions (flooding or drought from climate change, for example), as well as malevolent acts of sabotage, both on your physical assets and your cyber-control systems.

The lack of a hard and fast standard recognizes the need for these assessments and plans to be flexible and tailored to each utility's needs. However, there are some guidance documents that can act as a road map to the development of these documents. The AWWA has developed *J100-10 Risk and Resilience Management of Water and Wastewater Systems* to guide utilities in their assessments, available for purchase here: *www.awwa.org/store/product-details/productid/21625.*

Establishing Priorities, Determining Strategies, and Finding Funding Sources

The EPA's *Resilient Strategies Guide* will help you identify possible priorities to evaluate and strategies to fortify your assets based on your utility type (it includes wastewater/stormwater as options, in addition to drinking water), your utility size, and state. The Launch Guide button is at *www.epa.gov/crwu/resilient-strategies-guide-water-utilities#*, which will take you to the guide launch page at *www.epa.gov/crwu/resilient-strategies-guide-water-utilities#/utility-information?utilityname=&region=101&utilitytype=4&utilitysize=1315.*

Malevolent Acts: A New Concern

The risk for terrorism and potential sabotage must be taken seriously. The EPA has designed a guide to assist in this aspect of risk assessment and plan development, entitled *Baseline Information on Malevolent Acts for Community Water Systems.* This guide provides step-by-step assessments for different utility types and threats. The link to the EPA's site is *www.epa.gov/waterriskassessment/baseline-information-malevolent-acts-community-water-systems,* which includes the link to the document PDF at *www.epa.gov/sites/production/files/2019-07/documents/baseline_information_malevolent_acts_508_072519.pdf.*

Risk Assessment for Extreme Weather

If extreme weather is a major risk for your utility, there is an assessment tool that will help you project current and long-term conditions. CREAT has interactive maps to help evaluate your area and integrates with the resilient strategies guide at *www.epa.gov/crwu/creat-risk-assessment-application-water-utilities.* This resource also helps identify strategies and, in some cases, funding sources for implementation.

Don't Forget Chemical Safety

One of the asset categories identified is 'the use, storage or handling of chemicals.' The example cites chlorine as a chemical of concern for uncontrolled release. Maintaining a chlorine residual is key to the safety of your water, and maintaining safe chlorine handling practices is also critical to the safety of your employees and surrounding populations.

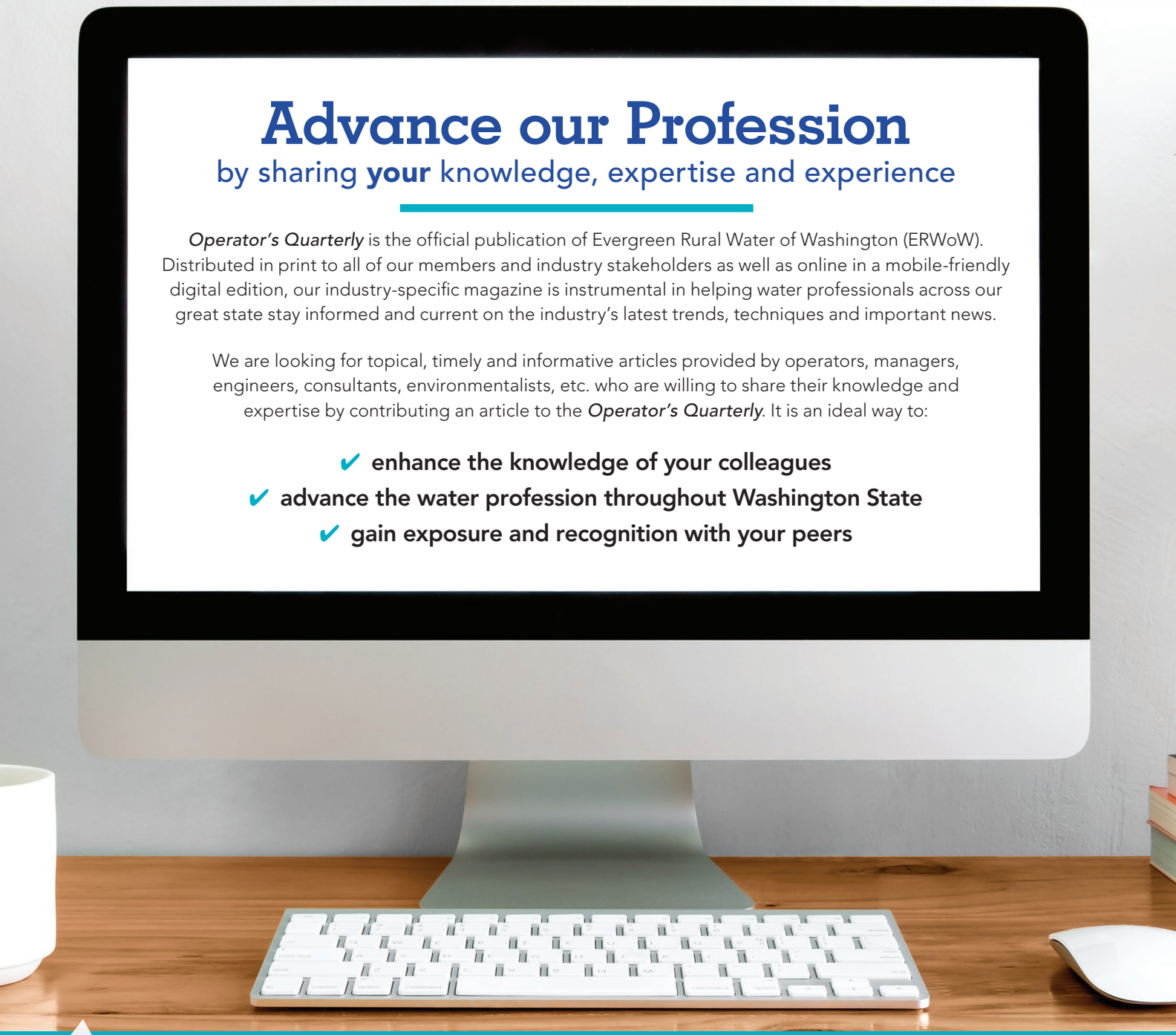
Your Communities Depend on You

You know your water is literally the life-giver to your community. The economic and physical health of your communities are only as stable as the water source you provide. Thorough risk assessment and emergency planning is critical to maintaining your utility and the welfare of your community.

Chlortainer Can Give You One Less Thing to Worry About

Chlortainer can vastly simplify the risk assessment and emergency response plan development surrounding chlorine by eliminating the potential for uncontrolled release. One less thing to worry about – wouldn't that be wonderful? Give us a call at 800-543-6603 and let us help.

Operator's QUARTERLY



Advance our Profession

by sharing **your** knowledge, expertise and experience

Operator's Quarterly is the official publication of Evergreen Rural Water of Washington (ERWoW). Distributed in print to all of our members and industry stakeholders as well as online in a mobile-friendly digital edition, our industry-specific magazine is instrumental in helping water professionals across our great state stay informed and current on the industry's latest trends, techniques and important news.

We are looking for topical, timely and informative articles provided by operators, managers, engineers, consultants, environmentalists, etc. who are willing to share their knowledge and expertise by contributing an article to the *Operator's Quarterly*. It is an ideal way to:

- ✔ **enhance the knowledge of your colleagues**
- ✔ **advance the water profession throughout Washington State**
- ✔ **gain exposure and recognition with your peers**

To be considered for the next issue of ***Operator's Quarterly***, submit your article to:
Kari Fenton, Administrative Assistant • *kfenton@erwow.org* • 360-462-9287

Coaches Corner

BY MIKE PENDERGRAFT, EASTERN REGION CIRCUIT RIDER

1. Systems that use chlorine dioxide will have to monitor for _____ .
   - **A.** Chlorite
   - **B.** Chlorate
   - **C.** Bromate
   - **D.** Bromide

2. What is the first barrier against pathogen intrusion?
   - **A.** Watershed management
   - **B.** Filtration
   - **C.** Coagulation and flocculation
   - **D.** Pre-disinfection or oxidation

3. Thrust anchors are usually used when _____ .
   - **A.** Soil has been disturbed such that a concrete block will not work
   - **B.** Time and cost need to be reduced
   - **C.** There is a horizontal bend in the pipe
   - **D.** There is a vertical bend in the pipe

4. A water audit is usually done by most utilities over a period of _____ .
   - **A.** One week
   - **B.** One month
   - **C.** One quarter
   - **D.** One year

5. If a pump operates under a high suction head, what should be used?
   - **A.** A packing gland
   - **B.** Lantern rings
   - **C.** A mechanical seal
   - **D.** Lantern rings and shaft sleeves

6. What can help a water utility avoid using large pumps?
   - **A.** Elevated storage tanks
   - **B.** Underground storage tanks
   - **C.** Altitude valves
   - **D.** Pressure-reducing valves

ANSWERS
1. A 2. A 3. A 4. D 5. C 6. A

Upcoming Events

OCTOBER

6	Sanitary Survey	Remote
6	Lead & Copper Rule: What do the Changes Mean for My Utility	Remote
6-7	Distribution System O&M and Disinfection	Remote
7	RTCR	Remote
14-15	SWSMP	Remote
15	UMC	TBD/Remote
19-22	BAT Exam Review	Shelton
21	PFAS: What Are They and What's Next	Puyallup/Remote
22	RTCR	Shelton/Remote
29	UMC	TBD/Remote

NOVEMBER

3-5	WDM Exam Review	TBD/Remote
4	Advanced Electrical	TBD/Remote
12	UMC	TBD/Remote

ALL EVENTS CAN BE FOUND ON
www.erwow.org/training/calendar.aspx

ERWoW Member Directory

EVERGREEN RURAL WATER OF WASHINGTON WOULD LIKE TO THANK OUR DEDICATED MEMBERSHIP!

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American AVK
American Flow Control
American Leak Detection of the Inland NW
Backflow Management, Inc.
Badger Meter, Inc.
Baker Manufacturing
Baker Silo, LLC
Big Dog Sales, Northwest
Biolynceus Enviromental Solutions
Blue Line Water, Inc.
Branom Instrument Company
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Century West Engineering
CHS Engineers
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Clow Valve Co.
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CUES
Ditch Witch NW
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Douglas Insurance
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Ford Meter Box Company, The
Frank J. Martin
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Oxarc, Inc.
PACE Engineers
Pittsburg Tank & Tower
Pumptech, Inc.
Romac Industries, Inc.
Sensus A Xylem Brand
Speer Taps, Inc.
UNIQUE Paving Materials Corporation
USABlueBook
Utility Services Associates, LLC
Varela & Associates, Inc.
Washington 811
Water Recovery Service, Inc.
Water Utility App LLC
Watersurplus
Whitney Equipment Company
Wilson Engineering, LLC

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49 North Ski Area
ABA Eagle Ridge
Aberdeen-Water Dept, City of
Acme Water District #18
Adams County Water District No.
Adams View Water
Admiral Water Users Association
Agri-Northwest
Airway Heights, City of
Algona, City of
Alpine Water District
Ames Lake Water Association
Aquarius Utilities, LLC
Arden Hills Water Association
Arlington East Mutual Water Association
Ashford Water District
Aston Estates Water Users Association
Aston Irrigation Association
Auvil Fruit Co.
Ayock Beach Improvement Association
Badger Mountain Irrigation District
Baker Industries LLC
Baring Water Association, Inc.
Basin View Water Association
Bay View Beach Water District
Beacon Hill Water & Sewer District
Beacon Point Community Club, Inc.
Beardsley Cove Water
BeauView Water
Beaux Arts Village, Town of
Belfair Water District #1
Bellevue, City of
Benton City, City of
Bethel Green Acres Water Association
Beverly Water District
Big Bend Landowners Association
Bingen, City of
Birch Bay Square Water Association
Birch Bay Water & Sewer District
Black Diamond Water District
Black Lake Bible Camp
Blaine, City of
Blakely Island Maintenance Commission
Blanchard Edison Water Association
Bloedel Reserve
Blue Lake Water Users Association
Blume/Ralph Water System
Boistfort Valley Water
Bothell, City of
Bremerton, City of
Brewster Flat Domestic Water Association
Brewster, City of
Brideck Meadows Water Association
Bridgehaven Water
Brinnonwold Community Association
Brookdale Owners Association
Brown – Taylor Water Co.
Bruce Water System
Buckley, City of
Bucoda, Town of
Buena Vista Community Club
Burbank Irrigation District #4
Burnett Water District
Burns Point Water Association
Butterfield Water Company
Calman Water System
Camano Laguna Vista Water Association
Camano West Water Association
Carbonado, Town of
Carlyon Beach Homeowners Association
Carnation, City of
Cascade School District #228
Cascade Valley Water District
Cashmere, City of
Castle Rock, City of
Cathlamet, Town of
Cedar Crest Mobile Home Park
Cedar Lyn Water Association
Chehalis, City of
Chelan County PUD #1
Chelan Parks Ranches Water Association
Chelan, City of
Cheney, City of
Cherokee Strip Hoa & Water Company
Chewelah Peak Community Water Co.
Chinook Water District
Chiwawa Communities Association
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City of Fife
City of Ilwaco
City of Issaquah
City of La Center
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City of Okanogan
City of Olympia
City of Port Angeles
City of Sequim
City of Sumas
City of Sunnyside
City of Tonasket
City of Vader
Clallam County Parks, Fair & Facilities
Clark Public Utilities
Cle Elum, City of
Clear Lake Water Users Association
Clearwood Community Association
Clifton Beach Water Co-op
Clifton Pebble Beach Water District
Clinton Water District
Coal Creek Utility District
Coleman Butte Water Association
Colfax, City of
College Place, City of
Colony Mountain Community Club
Colton, Town of
Columbia Rim Owners Association
Columbia Springs Estates
Columbia Valley Water District
Colville Confederated Tribe
Colville, City of
Community Sewer and Water District
Conconully Bible Camp
Conconully, Town of
Concrete Utilities
Connell, City of
Consolidated Water District #14
Cook Water System
Cornet Bay Heights Water Association
Corral Springs Water System
Cosmopolis, City of
Coulee City, Town of
Coulee Dam, Town of
Crane Island Association
Crescent Bar, Inc.
Crescent View Water System
Crescent Water Association
Creston, Town of
Crestview Tracts #3
Crestview West Water System
Crystal Lake, Inc.
Crystal River Ranch Association
Crystal Village Homeowners Association
Curlew Kai Homeowners Association
Curlew Lake Heights Water System
Cusick, Town of
Dabob Cove Community
Dallesport Water District
Darrington, Town of
Davenport, City of
Decatur Shores Community Association

Member Directory

Deer Creek Water Association
Deer Park, City of
Delicious Water System
Delta Water Association
Desert Aire Owners Association
DeVries Road Water Association
Dexter By The Sea
Diamond Lake
Water & Sewer District
Diamond Springs Water Association
Discovery Bay Village Water
Dockton Water Association
Driftwood Valley Association
Dry Creek Water Association, Inc.
Duck Lake Water Association
Dupont, City of
Duvall, City of
Eagle Ridge Water System
East Lake Water Association
East Mitchell Hill
Community Water System
East Spokane Water District #1
East Wenatchee Water District
Eastern Washington University
Eatonville, Town of
Edelweiss Maintenance Commission
Edmonds, City of
Elderwood Water Association
Electric City, City of
Ellensburg, City of
Elmer City, Town of
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Endicott, Town of
Enterprise Estates Water Association
Entiat, City of
Ephrata, City of
Erland Point Water Co.
Evans Water Association
Evergreen Sky Ranch
Community Water System
Everson, City of
Fairfield, Town of
Fairview Domestic Water Association
Fairview Mobile Home Park
Falls Creek Retreat Center-Billing
Fawn Lake Maintenance Commission
Fircrest, City of
Fisherman Bay Water Association
Fobes District Water Association
Fordair Water Co-op
Fordyce Water Association
Forest Ridge
Property Owners Association
Forks, City of
Four Lakes Water District
Fox Island Mutual Water Association
Freeman School District
Friday Harbor, Town of
Garfield, Town of
Gays Water District Association
George, City of
Girl Scouts of Western
Washington-Camp River Ranch
Glacier Springs Water Association
Glacier Springs Water Association
Glenhaven Lakes Club, Inc.
Gold Bar, City of
Golden Valley Water
Association, Inc.
Goldendale, City of
Goose Lake Water Association
Graham Hill Mutual Water Company
Grand Coulee, City of
Grandview Beach Water Association
Grandview Business Center
Grandview, City of
Granger Water Department
Grasslands Water System
Grays Harbor Co. Pacific Beach
Grays Harbor County,
Water District #2
Grays Harbor County,
Water Department
Grays Harbor Water District #1
Grays Harbor Water District #8
Greater Bar Water District
Green Tank Irrigation District #11
Griffin School District
Grotto Community
Water Association
Guide Meridian Water Association
H2O Management Services
Hanford Water Utilities
Hangman Hills Water District #15
Hanson Harbor
Harrah, Town of
Harrington, City of
Hartstene Pointe
Water-Sewer District
Hat Island Community
Hazelwood Heights Water
Heights Water
Hidden Hills Estates Association
Highland Trace Water Co.
Highland Water District
Highlands, The
Highline Water District
Hi-Lo Water Association
Hoh Tribe Community Water System
Holden Village
Holiday Hideaway Water
Holiday Valley Water Association
Holmes Harbor Sewer District
Holmes Harbor Water Co.
Hoquiam Water Department
Hydro Irrigation District #9
Inchelium Water District
Index, Town of
Indian Village Estates
Water Association
Inwood Beach Club
Ione, Town of
Iron Springs Park Association
Isle Aire Beach Association
Issaquah Valley Water Association #1
J.R. Simplot Company
Jackson Mobile #2
Jamestown S'Klallam Tribe
Jesfield Tracts Community Club
June Beach
Property Owners Association
Juniper Beach Water District
Kahlotus, City of
Kalama, City of
Kalispel Community Water System
Kamilche Point Community
Club Water System
Kamilche Shores
Community Association
Kelly Road Water Association
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Kent, City of
Kettle Falls, City of
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King Water Company
Kiona West Heights
Water Association
Kittitas County Water District #5
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