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Spring 2026

2026 – Hopefully a Swan Song

When Every Drop Counts

Water Rights – A Primer





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The Wyoming Connection is the official publication of The Wyoming Association of Rural Water Systems. It is published quarterly for distribution to member systems, water and wastewater Operations Specialists, water related agencies and companies, legislators and government officials.

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The Association

Wyoming Association of Rural Water Systems is a non-profit association that provides on-site, one-on-one technical assistance and training to small municipalities under 10,000 population and all water and wastewater systems throughout the state. Equal Opportunity Provider.

Cover Photo – The spillway at Pathfinder Dam, Photo by Mark Court



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*To provide the assistance necessary to meet the needs of our membership and to ensure the protection of Wyoming's water
~ our most precious resource.*

2026 – Hopefully a Swan Song

If plans hold with what we will call Plan Z, this will be one of if not my last article for the Wyoming Connection as the Executive Director of this great organization. Not to boast but hoping to give some perspective on where we were and where we are.

The Association incorporated in late 1989 and steadily grew over the next 15 years. I joined as the first Executive Director on January 1, 2006. In 2005, the Association had 5 programs (Circuit Rider - 2, Wastewater Tech, Wellhead Protection, Source water Protection and Training/Technical Assistance). At December 31, 2005, we had a cash balance of \$83,000; Total Assets of \$382,000 of which the building was \$225,000; Total Debt of \$224,000 – of which about \$175,000 was the mortgage on our building; Total Revenue from all sources of \$780,000 of which \$572,000 was program revenue of which 31% was for office overhead. The Association had 127 voting member systems; 89 associate member companies; 14 supporting member systems and 51 individual members. During 2005 we had 353 attendees at training conferences held. The Association had a total staff of 7.

In 2025, the Association has 12 programs (Circuit Rider -2; Wastewater Tech -2; Source water Protection; Training/Technical Assistance, Cyber Security training, Decentralized Wastewater; Wastewater financing, Apprenticeship -2; and we operate an Environmental Finance Center for financing/grant application assistance and technical assistance. We have cash/savings on hand of \$355,000; our building is paid off; total Revenue from all sources is now over \$1,660,000 of which \$1,253,000 is program revenue of and 18% of that is for office overhead.

The Association has 238 voting member systems; 124 associate member companies; 14 supporting members and 61 individual members. A couple of the individual members are contract operators with the bulk of the remaining voting member qualified systems. During 2025, we had 923 attendees at all of our training conferences and sessions. The Association has 11 staff members and 1 part time when we need them. Over the years we have had 17 staff members come and go along with 5 former board members.

To paraphrase our current US President, the state of your Association is strong!!

WARWSDOKU

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The objective is to fill in the empty squares so each row, each column, and each 3x3 block contains the numbers 1-9 with no repeats.

One of the items the Board requested of me when I was hired was to elevate the stature of the Association within the state and federal arena. We have had great staff over the years who have gone above and beyond, elevating our stature. Current staff are active members of many state and federal boards and task forces. We have a member on the following Gubernatorial appointee groups: Non-Point Source Task Force; State Emergency Response Commission; State Qualifications Review Committee; State Water Well Drillers and Pump Installers Licensing Board; Ground Water Advisory Council and the Small System Task Force. Staff are active Board members of the Wyoming Water Association; Wyoming Water Quality and Pollution Control Association; One Call of Wyoming; On the Verification Committee of Water Professionals International (the old ABC) whose job it is to develop the test questions for operator exams; local economic development board; county solid waste management board; several DEQ and EPA work groups and a member of the staff is on the National Rural Water Association Legislative Committee, Regulatory Committee and the Professional Development Committee. Staff members have testified in front of US Congressional committees on 5 occasions since 2015.

For me personally, there have just been too many highlights. At the top of the list was getting an invite from Sen. Barrasso to attend a State of the Union Address. It is quite an event. Senator Barrasso escorted me from his office through the tunnels to the Capitol, through the Rotunda past the gauntlet of press reporters and photographers to my seat in the gallery. I sat across an aisle from the President's guests' box and got a fist bump from rock star Bono on our way out after the speech.

Ranking right up there were invites from Sen. Barrasso and Senator Lummis to testify in front of the Senate Environment and Public Works Committee and sub committees (3 separate occasions) and from Sen. Enzi in Front of the Senate Budget Committee a couple times representing all of you and your chosen profession.

I've been privileged to have the opportunity to visit our nation's capital 30 times on official business and a couple times a year for informal meetings. It is awe inspiring to visit the monuments, museums; to see and read the real Declaration of Independence, see the original US flag, tour the Capitol numerous times, attend meetings in the Capitol, got to visit former Vice President Cheney in his office in the West Wing of the White House (his special district was our Best Tasting Drinking Water in Wyoming winner his last year in office which garnered us an invite to the White House),

I've been invited to meet with the Secretary of Agriculture; Administrator of the EPA in their offices to discuss pending legislation or regulations as well as met with a Speaker of the House in his office in the Capitol when we debated a reauthorization of an infrastructure bill. It is inspiring and humbling. I have developed some good relationships over the years like a Fox News personality (and maybe future Governor of California) Steve Hilton, who wandered into a group of us Rural Water people years ago and walked away with quite an education. I hope I've helped elevate all of you as "True Professionals" on the national stage.

Over the years, we have provided testimony on quite a few pieces of legislation that worked their way through the State House and Senate. There have been many successes, some for bills we wanted to pass, many for bills that we knew were bad for the systems and ultimately, your customers. Many current legislators hate it when people like me show up to argue against one of their bills. We typically show up with facts and examples of how the bill will hurt their constituents rather than help. Many current legislators do not want to try and explain why a bill their constituents want is actually bad for them, that would be real representation but...

A few good bill successes stand out, several years ago we were able to successfully include language in special district law allowing for easier access to loan financing; another success a couple of sessions ago was getting the bid limits

increased for special districts. Both successes put special districts on the same footing as municipalities.

Over the years we have assisted at least 8 areas organize into Special Districts, accessing millions of funding for new water/sewer lines, tanks, wells. It is satisfying when the projects are completed and water starts to flow.

My greatest joy in this "job" has been the opportunity to do as I tell people, "my job is to travel around the greatest state and talk to people". Water and Wastewater Operators are the best people to talk to!! It has been a privilege and honor. Anyone who would like to discuss how you can travel around Wyoming and talk to people (and get paid doing it), the job is still available, so, give me a call. Mr. P.



Fox News personality (and possible future Governor of California) Steve Hilton





Sharing a picture in Senator Barrasso's Capitol Majority Whip Office.



Sharing a lasting photo with Senator Lummis as we both enjoyed our last (probably) Capitol Hill visit together.



Vp group – left to right: Our 2007 visit to the White House: Kris Cash, NRWA; Loren Crain, then President of WARWS; Fred Sheldon, then Exec VP, NRWA; Former Vice President Cheney; WARWS ED; Rob Johnson, then CEO of NRWA; and Earl McKinney, then WARWS National Director.

When Every Drop Counts

As I sit here writing this, we have had our first real snow of the season. It is February and the State Engineer's Office has already issued a call on junior water rights. Over the years I have written about water conservation. It seemed like a good thing to do for capacity development if nothing else. Water conservation is no longer just an afterthought. It is an imperative.

We live in a state where wind shapes the land, snowpack determines our summer, and reservoirs quietly dictate the rhythm of entire communities. When winter snowfall comes light or melts too early, we feel it months later, at intake structures, in storage tanks, and on distribution maps. Drought in Wyoming is not a distant headline; it is a working reality for water systems across the state.

According to the U.S. Drought Monitor, much of Wyoming has experienced moderate to severe drought conditions in recent years. Earlier snowmelt, warmer temperatures, and prolonged dry periods continue to stress both surface water and groundwater supplies. For rural water systems, that means tighter margins, increased demand, and difficult operational decisions.

Yet drought does not have to mean crisis. With proactive planning and disciplined conservation practices, water systems can stretch supplies, protect infrastructure, and lead their communities with confidence.

The cheapest gallon of water is the one you don't lose. You can't ask your customers to conserve until you demonstrate to them that the system is doing everything they can do to implement their own conservation methods. Set a good example. Know what your water loss is and track it. How much water do you produce or purchase? How much water do you sell? The difference between the two is your water loss.

To actually get any sort of accurate figure, you need to meter every drop. Accurate metering is the backbone of conservation. Systems without universal metering are operating in the dark, especially during water shortages. This should include metering water going to the parks, cemetery, and ball fields. Remember, older meters tend to under-register, masking actual demand and reducing revenue needed for improvements. I have seen systems with water loss north of

50%. That is just not acceptable in these dry times. Systems should be striving for less than a 10% water loss.

Aggressive leak detection programs are essential. In aging systems, even small leaks add up to thousands of gallons per day. This is water that has already been treated, pumped, and paid for going into the ground. Routine valve exercising, pressure management, and strategic pipe replacement should be part of your O & M manual and long-term asset management plan. Every gallon recovered through leak repair is a gallon that remains in storage for fire protection, peak demand, or extended dry periods. In drought conditions, water loss control is not optional it is foundational.

The best conservation method for any system are rates that send the right economic signals. The only reason I don't turn my thermostat up to 90 in the winter is because I know Rocky Mountain Power is going to send me a bill that I can't afford at the end of the month. It is the same for water. Water rates are often viewed solely as a revenue mechanism. In reality, they are one of the most effective conservation tools available to a system where higher usage should result in higher per-gallon costs. This encourages efficiency without penalizing essential indoor use. Seasonal surcharges during peak irrigation months can reflect the true cost of increased pumping and treatment. I have not yet seen Wyoming systems do this, but clearly defined drought-stage pricing, tied to storage levels or supply triggers, sends a strong and consistent message and should be considered. Rate structures should support both financial sustainability and conservation. When customers understand that higher use carries higher cost, behavior often follows.

As in most things in life, planning is the key to successfully navigating these dry times. Every water system in Wyoming should have a clearly defined drought contingency plan. This document should not sit on a shelf; it should be a living operational guide. An effective drought plan should at a minimum have the following:

- Defined drought stages (e.g., Watch, Warning, Emergency)
- Specific trigger thresholds, such as storage percentages or streamflow reductions
- Pre-drafted public messaging for each stage
- Enforcement procedures for watering restrictions
- Identified emergency interconnections or backup supplies

I highly recommend that you read your permit from the State Engineer's Office and make sure you are living within your water budget. If you do not have your permit you can find it on the State Engineer's Website. Finding it is not always easy, so if you need help reach out to us. We can help.

While we may be in spring, it is absolutely the time to start preparing for summer. In many Wyoming communities,

outdoor irrigation doubles or even triples summer water use. Managing outdoor demand is one of the most immediate ways systems can protect limited supplies. While I am not an advocate of mandatory restrictions, they almost always lead to more water being used, we should be encouraging the following:

- Odd-even day watering schedules
- Time-of-day irrigation restrictions
- Public education on xeriscaping and drought-tolerant landscaping
- Promotion of drip irrigation over traditional sprinklers
- Bill inserts and social media campaigns focused on smart watering

Partnering with local conservation districts or extension offices can amplify these efforts. Education does not need to be complicated; simple reminders about adjusting sprinklers, repairing leaks, and watering during cooler hours can significantly reduce demand.

Conservation is not only about short-term thinking, it is about long-term resilience. Systems should evaluate whether additional storage is feasible or whether secondary water sources could diversify supply. Take static levels at your wells and document water levels. If they are trending down, you need to know. Source water protection planning can also

strengthen your drought preparedness. If you don't have a source water protection plan, now is the time to call Michelle Christopher and get started.

Funding programs such as the Wyoming Water Development Commission, State Revolving Funds or USDA Rural Development can also support infrastructure upgrades that improve efficiency and reliability. Drought may be the catalyst that pushes you to pursue improvements that should have been addressed years ago. Forward-thinking investment today reduces emergency spending tomorrow.

You are a leader in your community. Now is the time to step up. When operators and board members communicate clearly, share data transparently, and model responsible use, customers are more likely to respond positively.

In Wyoming, water has always meant survival. Conservation is about ensuring fire protection reserves remain intact and that water comes out of the tap. It is about protecting aquifers for future generations. It is about recognizing that in a dry climate, reliability requires discipline.

We have always adapted to the land we live on. Drought is not new here. What matters is how we respond. Making every drop count is not just good management, it is good stewardship, and stewardship of the land and our resources has always been part of who we are. We can do this.

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The Wyoming delegation to the NRWA Rural Water Rally celebrating Grand Targhee Resort's Silver Medal win at the Great American Taste Test. Grand Targhee Resort joins The Town of Ten Sleep as a previous Silver Medal winner; Aspen Pines Water and Sewer District as our only Gold Medal Winner. The Town of Saratoga and The Town of Afton have also placed in the top 5 in the national contest. Not bad, 5 top 5 winners since 2005. 15 additional Wyoming systems have made trips to the contest in DC over the years finishing in the top 10.

L-R – WARWS ED Mark Pepper; Ben Hitchcock – Grand Targhee Resort Utility Manager; Wyoming National Director Chuck McVey and Michelle Christopher – Field Staff Supervisor for WARWS.



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please email members@nrwa.org.

Water Rights – a Primer (enough knowledge to be dangerous)

In the west, water has always been for fighting over. This year, with the abysmal snowpack, the sabers are rattling early. An administrative call was placed on the North Platte February 12, requiring junior water users to immediately cease diverting water from the North Platte, or using wells that are hydrologically connected to the North Platte. What does this mean? How are water rights in Wyoming determined, and what is a junior and senior water right?

Wyoming water law was established before Wyoming became a state. Elwood Mead was the Territory Engineer, crafting the laws that would administer water within the state in 1888, two years before Wyoming achieved statehood. Mead continued as State Engineer from 1890 until 1901. The basics of Wyoming Water law are: all natural waters within the state's boundaries are owned by the state. This includes surface waters like rivers, creeks and lakes, as well as groundwater including springs, aquifers and wells – artesian or pumped.

Individuals, companies, municipalities and other legal entities can apply for a right or permit to put that water to beneficial use. Beneficial uses include irrigation, municipal, industrial, power generation, recreational, stock, domestic, pollution control, in-stream flows, and miscellaneous. The withdrawal amounts of these rights or permits are limited. For example, irrigation is generally limited to 1 cfs (cubic foot per second) per 70 acres, and domestic wells are limited to no more than 25 gpm. Finally, these rights are prioritized by appropriation date, hence the phrase “first in time, first in right.”

Cool, Michelle; now I have a leg up on bar trivia night. How does this apply to me and my water system? First, I encourage every water system to have their water rights permits on file. If you don't know what water rights you have, much less the actual paperwork, go to the State Engineer's water rights database ePermit <https://seoweb.wyo.gov/e-Permit/Common/Login.aspx> to search for your water system's water rights. You can find your personal water rights as well, should you own a well or have irrigation rights. You can use your permit number, system name, or location of the diversion or well to search for a right. If you find the database unwieldy, rest assured that you are not alone. If you would like assistance, contact your friendly WARWS folks!

When you find those permits, there are three things to look for. First, look for the appropriation date. This is the date that the SEO has as the water first being put to beneficial use. If there's an administrative call that limits water diversions (including some groundwater), this is the date that counts.

Second, look for the total amount of water that is permitted to be used. This may be written in several ways including total acre-feet of water per year, total acre-feet of water in 10 years, and maximum instantaneous flow (usually gallons per minute). This is the amount of water this diversion is permitted to produce (pump, withdraw, whatever).

Finally, look at the back of the permit, or scroll down to the bottom of the page if it's an electronic version. There may be conditions and limitations included on the permit. These are additional requirements to maintain the permit. Examples would be a well must be metered, annual flows must be recorded and submitted to the State Engineer's office and static and pumping levels of the well need to be recorded and submitted.

Now that you have your system's permits, look back through the data that you collect. Are you pumping more or less than what is permitted? How have the water level records that you have been collecting changed? Perhaps they stayed the same? Is one well producing at a different rate than the oth-

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ers? Having water production data is how you are able to show, or prove, that you're putting the water to beneficial use. If your system is not putting an existing water right to beneficial use, the SEO will not grant you additional water rights. If your water sources are currently or were previously unmetered, it is possible to calculate water flows through electrical usage. Again, contact WARWS if you need help with this!

What happens if you need more water? For groundwater sources, you have options. If the physical well can produce more water, then an enlargement can be applied for which increases the permitted pumping rate but not the physical size or depth of the well. You can also apply to deepen the well, offset the well or just drill an additional well. For surface water, you also apply for an enlargement. This could be for additional points of use (enlarge the map of lands that the water will be used on), or additional flows. Enlargements may have priority dates separate from the original appropriation.

What happens when there's not enough water to go around? The Division hydrographers, Board of Control and State Engineer must review the water rights of a water source (usually a surface body of water like a river) and begin shutting off junior users until the oldest rights are satisfied. Junior water user is a term that merely means that the water right was adjudicated after the call date. Senior water rights were adjudicated before the call date. Junior water users have the

option to make agreements with senior users to allow them to use a portion of the senior user's water right. This can be done through a temporary water use agreement (TWUA). This form, as well as all other SEO forms can be found at <https://seo.wyo.gov/>.

This is a small primer on water rights in Wyoming. More information is available on the State Engineer's website. Much of it is specific to a water source or drainage. I encourage everyone to know what water they have available to them, and what the options are for alternative water sources, water agreements and expansion. Having this information before the river dries up or the pump goes dry will help keep your system sustainable and your community flourishing. If WARWS can help along the way, give us a call.



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A Note From Victor Spencer

Water Quality Action Specialist
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When I was told I had to write a column for The Wyoming Connection, I had no clue what I was going to write about. As I thought it out, I finally settled on what I have seen coming from a bigger system for Wyoming to help smaller systems in Wyoming. To say the least, it is like night and day.

The system I worked for was run for twenty-five plus years by an amazing director that not only instilled good practices in his people, but an attitude of fiscal responsibility and understanding that the money we got was ours to protect and use prudently. I am learning that that was truly a luxury for us. Newer trucks, good equipment, and a stock of replacement parts for us as needed are not the norm and not a thing for most of our small systems. In my meager four months with WARWS, I have seen things I thought were exaggerated or built up to sound worse than they were. I am getting a very quick education in true operations and the meaning of "improvise, adapt, and overcome" and by what I have seen so far, it would make any devil dog proud of Wyoming operators.

They work on shoestring budget with little to no help and most are well past retirement age. As much as they would love to put their boot on the nearest fence post and drive off into the sunset, they cannot, they will not. In most cases, they are the only operator or the only operator with a license. They would retire, but can't find someone to take the reins, or they are working to try and get new guys that have no experience trained and ready to take on the immense responsibility that small system operators endure. In other systems, there is a brand-new operator with little experience and instead of taking the reins they just had the saddle thrown at them and told so long pardner.

Coming from a large system, I found in my 33 years one thing to be true; if you do not enjoy, understand and have a passion for being an operator, you will not be here long. Bigger city to the smallest district this holds true. We know we will not get rich, we know there will be long days and longer nights. We come to learn, we have a passion for our careers, and very few come into this industry with that already there. Our knowledge gets evaluated every day by the city councils, mayors, customers, the EPA, and sometimes a coworker but Wyoming's operators endure. I have also seen firsthand how much Wyoming operators push to learn and help each other when they can, from taking over as a backup operator for the community 40 miles away because there is no back up for the system or the operator there is having health issues. From broken bones to cancer, our water family shows

up for each other.

My new position is Water Quality Action Specialist. At first, I did not understand what that was or what it meant. In many ways I still don't, but I do know that the services and support we provide can change communities for the better in so many ways that the operator, the town and individuals from the oldest to the baby that's formula is being made with our water may never understand.

In the end, I genuinely want to salute the small town and district operators who are patching their plant up with bubble gum, bailing wire and JB weld. They have shown me the sincere heart of an operator. The tenacity to push through using parts that have scavenged from every source they can find, to new and innovative way to run chemicals for treatment. All the while keeping their system running and making good water, passing the test for their licenses and the EPA scrutiny on budgets that barely exist and doing it all with a passion that rivals herculean strength. The men and women in our water world are truly a remarkable sight, and I thank each and every one I have met and hope to meet for teaching me what being an operator truly means.



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Losing an Icon

I will start this article with a little background about me. I played sports for 1 year in high school and decided to work instead of playing sports so I could buy a vehicle.

I am now 66 years old and will have to tell you that Mark Pepper is the best boss I have ever had in my lifetime. Hell, I can't even remember who was the Executive Director before Mr. Pepper.

As most of you know, Mr. Pepper is trying to retire from Wyoming Association of Rural Water. He will be greatly missed and very hard to replace.

Every time I turn around, Mr. P is on a plane flying some where for meetings, Executive Director's meetings, Water Rally in Washington DC, not to mention all the other meetings he attends.

Mr. P treats us like family (which Rural Water employees are a family) and I have received very good advice from him when working with systems I am helping. I am amazed by the knowledge that Mr. P has and always has an answer for you or will find out the answer for you. He will always make time for you and will sit down and just shoot the breeze with you. Mr. P seems to know all the systems in the state and then some in other states.

When we attend Water Pro or in-service, Mr. P always makes time for all of us to attend dinner together, as a family should. Mr. P always makes time for anyone that wants to visit, ask questions, or just say hi.

Whoever is picked to fill Mr. P's shoes will have their hands full, but with the help and training from Mr. P and the help from the employees, that person will do fine.

Yes, I hate to see Mr. P retire, but he needs to take the time to be with his wife and family and do what he pleases. I am sure it will be hard on Mr. P as well and he will be greatly missed.

May God bless you Mr. P, your family and the endeavors you're about to take on. Please stay in touch with all of us and safe travels. Happy retirement, Sir!

Cheese Log

By Randy Rumpler

12- pound box of Velveta cheese

1-8oz of whipped cream cheese

1-Bottle of Salsa or Picante Sauce

Lay out two large pieces of plastic wrap, (I use freezer paper) cut the Velveta cheese

Length wise, place a piece of freezer paper on top and roll out each half to make two cheese logs. Spread the cream cheese over the Velveta cheese and spread out, add Picante sauce over the cheese, you may add Tabasco sauce to taste and roll up into two different logs. Leave in refrigerator for about one week.

Eat with crackers or chips and enjoy!



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A Note From Austin Quintrall

Wastewater Specialist
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As a technical assistance provider for our rural water systems, I'm seeing a "financial squeeze" that is becoming impossible to ignore.

In many of our most scenic areas, property values are skyrocketing as out-of-state buyers move in, pricing out the very people who keep these towns running.

The reality is that many longtime residents can only afford to stay because they've been there for generations. If they had to buy their own homes at today's prices, they'd be looking for a place to live in a different state.

This creates a heartbreaking dilemma for local water boards. They have aging infrastructure that desperately needs attention, but they refuse to crush their neighbors—who are already struggling with rising taxes—with the massive rate hikes required to fix it.

This influx of "paper wealth" is effectively trapping our small utilities in a no-man's-land. On a spreadsheet, these communities look like they are thriving because real estate prices are at an all-time high, but that "new money" doesn't flow into the utility's pockets. Instead, it creates a massive gap between the cost of living and the local ability to pay for essential services.

We're reaching a point where the people who have spent their lives building these communities can no longer afford the infrastructure they've lived on for decades, leaving water boards with no easy way to fund the critical upgrades needed to keep the water flowing.

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A Note From

Brian Linton

Circuit Rider
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Thank You, Wyoming Operators

Thank you!. Yes — you. The operators of every water and wastewater system across Wyoming.

The official week recognizing Wyoming's professional water and wastewater operators has already passed, but I believe it deserves more than just a week on the calendar. Do you remember where you were on February 5, 2026? Did you know that February 9–15, 2026 was Wyoming Professional Water and Wastewater Operators Week?

Some of you were aware of the proclamation signed by Mark Gordon. Some of you may have heard about it afterward. I happened to be near Cheyenne when an operator received a call asking if he would attend the signing event. I hadn't heard about it myself, as unforeseen circumstances prevented a mass email from reaching all operators in advance. Still, I decided to make my way to Cheyenne for the occasion.

I was impressed by the number of operators who were able to adjust their schedules and attend. It's not easy to make a 4:00 p.m. event in Cheyenne when you're responsible for keeping systems running — and it's certainly impossible for everyone across the state to be there. Yet those who attended represented every operator in Wyoming. Listening to Governor Gordon share his gratitude for the professionals who safeguard Wyoming's water and wastewater systems was meaningful. Only a handful of operators were present to hear his words and receive a handshake of thanks, but his appreciation extends statewide.

As a Circuit Rider, I have the privilege of visiting systems throughout Wyoming. I see firsthand what you do every day. THANK YOU — for what you do and for how you do it.

Some of you operate small systems with limited budgets and staffing, yet you keep your communities running. Water treatment plants function. Wastewater systems operate. Lagoons are maintained. Streets stay clean. Violations are minimal. You make it work.

Others serve larger systems with teams and resources to share the load. Regardless of size, I consistently see pride and professionalism. Your shops are organized. Your plants are clean. Your records are in order. The care you put into your systems is evident the moment someone arrives on site.

I only wish more community leaders — mayors, council members, and board members — could see what I see across this state. The quiet dedication. The early mornings. The late-night callouts. The emergency responses. The neighbor helping neighbor without paperwork or red tape when another system is overwhelmed. That spirit speaks volumes about Wyoming operators.

I also want to say thank you for welcoming me and the WARWS team into your systems. I know some days are busy, and time is tight. Even so, you make room for conversation, problem-solving, and collaboration. If we miss each other, know that we will keep checking in. We are all in this together.

Operator Week may have come and gone back in February, but appreciation should not be limited to seven days.

So once again — THANK YOU!. Keep up the great work delivering clean, safe water and protecting public health across Wyoming.

You make a difference every single day.



Operator's Corner

WW Practice Questions by Brian Linton

1. Anoxic is defined as an environment that contains a low dissolved oxygen concentration (0.0 to 0.2 mg/l) and forms of oxidized nitrogen.
 - a. True
 - b. False
2. TKN stands for:
 - a. Total Kjeldahl Nitrogen
 - b. Total Kinetic Nitrogen
 - c. Temperature Kelvin Nitrifiers
 - d. Temperature Kraus Nitrifiers
3. Denitrification occurs during
 - a. Anaerobic conditions
 - b. Aerobic conditions
 - c. Sludge dewatering
 - d. Aerobic digestion
4. Temperature has a large effect on the rate at which bacteria grow in a water source. The general rule of thumb says that for every increase in temperature of ten degrees centigrade:
 - a. The bacterial growth rate will double
 - b. The number of bacterial cells will decrease by half
 - c. Sterilization will increase
 - d. The growth rate will triple
 - e. No change occurs until 100 degrees centigrade
5. Disinfection is usually accomplished with the use of chlorine, but other methods are sometimes used. Disinfection is the process of:
 - a. Sterilization of the water
 - b. The killing of bacteria
 - c. The control of coliform bacteria
 - d. The killing of pathogenic or disease-causing organisms
 - e. Control of bacteria, virus and protozoans
3. Wells can allow direct contamination of an aquifer due to inadequate grouting or seals.
 - a. True
 - b. False
4. Which water treatment processes are used to remove or kill pathogenic organisms?
 - a. Coagulation
 - b. Comminution
 - c. Disinfection
 - d. Filtration
 - e. Sedimentation
5. How many gallons of hypochlorite were pumped by a hypochlorinator if the hypochlorite solution was in a container with a diameter of 42 inches and the hypochlorite level drops 15 inches in 24 hours?
 - a. 26.5 gallons
 - b. 80 gallons
 - c. 82.5 gallons
 - d. 90.0 gallons
 - e. 100.0 gallons



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$$\text{Hypochlorite, gal} = (\text{Container area, sq in})(\text{Drop, in})(7.48 \text{ gal/cu ft})$$

$$= (0.785)(42 \text{ in})^2(15 \text{ in})(7.48 \text{ gal/cu ft})$$

$$\frac{(144 \text{ sq in/sq ft})(12 \text{ in/ft})}{24 \text{ hr}} = 90 \text{ gallons}$$

WW Answers.

1. True 2. A 3. A 4. A 5. D

Water Answers

1. B 2. A 3. A 4. C 5. 90.0 gallons

Known

Dia, in = 42 in

Dron, in = 15 in

Time, hr = 24 hr

Unknown

hypo-chlorite gal pumped

Water Practice Questions by Michelle Christopher

1. Clear water is always safe to Drink.
 - a. True
 - b. False
2. What is a sanitary survey?
 - a. A detailed evaluation of a source of water supply and all water facilities.
 - b. A detailed survey of the boundaries of a watershed.
 - c. A survey of consumers' sanitary disposal practices.
 - d. A survey of sanitary landfills located over an aquifer.

Our Western Heritage

by Kathy Weinsaft

Ready Set Go! It's Spring in Wyoming

As of February, we have not had much winter, but by the time you read this it will be spring and spring always brings a bucket list of the wonders of Wyoming that I want to visit and experience once again.

I love the Big Horns, and one of the true treasures of Wyoming is Shell Canyon. It is one of the places I try to take visitors from back east. It is some powerful eye candy for sure. It has some of the most powerful views in the whole state. It has it all towering cliffs, cascading waterfalls, and lush forests. There are hiking trails galore, and it never disappoints. If hiking in the beauty gives you hunger pains, think about stopping at the Shell Store. It's bakery is second to none. They also have other food, but who can get by the sweets?

If you are looking for ice cream and some really unusual Wyoming ketch, I highly recommend Dirty Annie's. I always come out of there with an ice cream cone and some tee-shirt I don't need and a big smile on my face.

If you happen to be in the Big Horns in June, the wildflowers will be awash in color that is just spectacular. One of the best viewing spots is at Bear Lodge at Burgess Junction. Wander around the place. It has a beautiful stream running right through the fields of wild flowers and a fabulous restaurant called Moose Crossing. It has been some time since I have seen a moose there, but I have seen them as well as elk.

Not far from Bear Lodge is Steamboat Rock. It offers some wonderful views if you take the hike. The rock face resembles the prow of a steamboat. It rises over 600 feet above the surrounding landscape. It is a great hike, but it has an elevation rise of 700 feet over only 1.7 miles, so it is definitely an aerobic activity. You can see all of Sheridan County and a lot of Cloud Peak Wilderness from the summit if you are willing and able to make the hike. Be sure to buy some jerky from Steamboat Sam if he is around. It is a tradition.

While you are in the area be sure to visit Sibley Lake. It is just truly beautiful and Wyoming at it's best. It is truly a mountain lake at 7,900 feet elevation. There is a boardwalk and dock which provides some absolutely stunning views. You can enjoy a relaxing stroll around the shoreline of Sibley Lake. This loop winds through pine forests and closely follows the entirety of the lake. You'll get the chance to view wildflowers, but they are latter blooming than the ones at Bear Lodge. The trail is well-marked and maintained, and there are a few foot bridges along the way. In the spring and

winter, wet and muddy conditions exist, so be sure to wear good foot ware.

One of the most beautiful drives in Wyoming is from Burgess Junction to Ten Sleep. It takes you through the Big-horn Mountains and through Ten Sleep Canyon, which is a destination all onto itself. It is 161 miles of landscape that lives up to Wyoming's motto of, "like no place on earth". How can you not love Ten Sleep, Wyoming. It is just dripping with Wyoming charm. Let me be clear, I do not climb rocks, but for those that do, Ten Sleep is now one of the premier limestone climbing areas in Wyoming. I also don't drink, but for those that do, it is home to one of the quirkiest breweries in Wyoming. Ten Sleep Brewing Co. makes all of it's beers in-house and hosts all sorts of eccentric events throughout the year.

As I have often said, "If you're bored in Wyoming, you just haven't opened your front door." Open that door and get out there and enjoy spring.

It is, after all, part of our Western Heritage

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Self Portrait

Scrawny Girl's Shrooms

by Michelle Christopher

Spring is coming. Not the non-winter/not really nice enough to anything else season we've been experiencing the last few months, lovely spring with promises of renewal, growth and joy.

The moisture probably won't last long, but while it does, foraging for wild plants is a fun way to get out and burn off the winter cobwebs. Many folks regard wild mushrooms as toxic, psychedelic, or plain untrustworthy. I know enough about mushrooms to only eat the ones I can positively identify as edible. (Actually, that's a good rule of thumb for all wild foraging.) My list of edible mushrooms that I can positively identify is pretty short: the puffball. I am fully aware

that there are other wild edible mushrooms, none of which grow close to me. So – the puffball, what does it look like, and how do you use it?

There are actually several species of puffball that grow in Wyoming. However, they all have the same critical defining characteristics, so we can treat identifying them the same way. Puffball mushrooms (*Lycoperdon*, *Apioperdon*, *Calvatia*, and *Bovista* species) have neither cap nor gills, only a puffy stem. A good rule of thumb when identifying them is that if you slice them in half, it should look the same throughout, no lines, gills, change in texture, etc. Sorta like a spongy marshmallow. Also, when cutting them open, note the color and texture of the flesh, if it's yellowed, brown, green or goopy, it's past its prime and should not be consumed. Puffballs on the sagebrush steppe are generally 2-4 inches in diameter, but in the mountains, they can be found over 24 inches in diameter. My personal record happens to be 10 inches, found in an aspen grove. Yes, it was solid, and yes, we ate it. We sliced it, marinated it and grilled it like steaks.

When foraging for puffballs, I find it best to get out a day or so after a rainstorm. It doesn't take long on the desert for them to spring out of the ground, and it doesn't take long for them to decay. I've found puffballs as soon as the ground thaws up until the ground freezes. Hunting season has become one of my favorite times to look for them, even if I'm accused of being distracted and not looking for deer. I'm hunting, I'm merely on a side dish quest. If you do find some puffballs, gently pull them out of the ground. If they come out whole, great. Slip them in a bag. If they disintegrate, you didn't want to eat them anyway. Keep your haul cool and dry and remember to get them out from under the backseat. Otherwise, you'll be instantly reminded that you forgot something on the next really warm day.

When you get ready to use your puffballs, first gently brush as much sediment as possible off them. Slice the mushrooms in half, if you haven't already done so to confirm that they are indeed puffballs and are still ok to eat. Then, peel the outer layer of the mushroom to remove any remaining grit that has embedded itself in the skin. At this point, some people soak them in salt water, but it seems excessive to me. Also, too much salt makes mushrooms tough. I like to slice them a quarter of an inch thick and fry them in butter until the edges are crisp. Because honestly, what's not delicious fried in butter?

Important notes to get crispy edges: 1) ensure mushrooms are dry. If you've been soaking them, lay the slices on paper towels. 2) pre-heat your skillet (cast iron) and melt the butter. Then add the mushrooms in a single layer. Crowded mushrooms don't crisp. 3) for the love of Julia Child, do not put a lid on these. Steamed mushrooms are sad mushrooms. Spring is coming, and I'm looking forward to adventures in the wilds. Do you have spring plans? Do you have a favorite foraging plant? Let me know at mchristopher@warws.com.

How to Get Fair Rates, Part 2

Carl Brown, President
GettingGreatRates.com

Recall, in Part 1, I told you that after deducting all other “bankable” revenues, over the long run rates must be adequate to pay all costs and should be in a fair structure. Cost-to-serve rates are the “poster child” of such rates.

I also told you the American Water Works Association (AWWA) publishes the “M1 Manual,” formally entitled “Principles of Water Rates, Fees, and Charges.” You probably should have a copy.

But many readers may not want to invest the time to follow hundreds of pages of instructions for their rate study. Therefore, I offer a shortened variation of the “functionalization” task to make things simpler. In the following I will use the “you” pronoun, assuming you will be the one to do this.

Are “Fixed” Costs Really Fixed?

For accounting purposes, a “fixed” cost is one that does not change (or change much).

For rate setting purposes, a “fixed” cost should be one that is related to the fact you have customers, and all customers benefit equally from that cost.

Consider that next year’s costs will be about 97 percent the same as this year’s costs (three percent inflation). That makes it seem that nearly all the utility’s expenses are “fixed.” But if you calculate a level minimum charge that recovers 97 percent of the costs, you are ripping off the low-volume customers.

To be fair, you must consider the purpose of each cost. Does it serve customers? Does it serve the commodity? Now you’re on track.

From your expense “statement” for a test year you classify each cost according to its nature or effect. To do that, you should ask these questions:

1. Is this cost related to the fact the utility has customers? If so, it is a fixed cost recoverable from a base minimum charge. Typical fixed costs include the cost of billing, general administration and similar things that apply to every customer equally, or close enough to equal that you can settle on that.
2. Is the cost related to the commodity itself? If so, it is a variable cost, recoverable from the unit charge. Typical variable costs include the cost of purchased water, treatment chemicals and electricity used to pump water.
3. And then it gets more complex. Many costs are partly customer-based and partly commodity-based. What percentage of each such cost benefits customers equally? And what percentage is directly related to providing the

commodity?

a. The costs of staff fall into this category. They are partly fixed, partly variable. The “splits” vary a lot from one utility to another and from one time to another for the same utility. Generally, the larger the utility, the more staff costs are related to the commodity, the unit charge. Costs that are directly related to staff – health insurance, Social Security and the like – should be split the same way staff salaries are split. If you classify salaries at 33 percent “fixed,” and 67 percent “variable,” classify the benefits the same way, too.

i. To get very “wonky” on you, early in the life of a utility it just exists. It has not yet served the first unit of the commodity. If it never serves the first unit, all the costs of the utility are frozen at “fixed.” This is kind of the “big bang” stage of almost every utility, very brief.

ii. The next stage is rapid expansion. The system is new and connections are being made rapidly. During this stage, not much volume is being served yet. Most of the costs are still “fixed.” If the customer base never “grows into” the capacity of what was built, much of the costs will remain “fixed.”

iii. Finally, the utility is fully serving its purpose – providing the commodity. At this stage, a high percentage of the utility’s costs are variable. The utility has reached its end goal, serving water as efficiently as it can.

b. If your expense statement already tracks administration, billing and similar kinds of costs separate from operational staff salaries (and you should track such expenses this way), part of the “splitting” has been done for you. The administration type staff would logically be classified as a 100 percent “fixed” cost. You still will need to make a classification “call” about the operations salaries and benefits, “fixed” versus “variable,” but that one will now be easier.

4. Aside from the costs of providing the service, there are the costs of having the ABILITY to provide the service – capacity costs. If your utility has few large meters, or the customer base is growing slowly, you can just ignore this issue. Otherwise, that will be covered in a future article.

What Costs Should You Classify?

First, only classify last year’s costs if that cost structure will continue for several years to come, which is not likely. Otherwise, classify projected costs for a future year. Why?

You want rates to adopt later this year, or early next year. And you want rates that will be fairly structured for several years, even after making inflationary increases. Thus, the costs you classify should be representative of costs to be incurred for as far into the future as you want to avoid doing another full rate analysis. How far out is that? Probably five years on the short side and seven to ten on the long side. Look out that far and you will probably incur system improvement costs – probably the real reason you are considering new rates anyway.

How should you proceed through all these calculations?

First, you should classify costs from a certain year, usually a few years into the future.

, you should calculate the system development fees and the revenue they will produce. Or just ignore such fees if that is appropriate. Let us assume ignoring is the right course for you.

Remember, you classified annual costs as “fixed” or “variable” above. By adding up the fixed costs you will find how much money the base minimum charge needs to recover that year. Do the same for variable costs to find the dollars that a level unit charge would need to recover that year.

There are two more issues to deal with before calculating rates: inflation, which you can handle; and the cost of system improvements, which likely should trigger getting an outside rate analysis.

Handle inflation like this. If you inflated costs up to a future year, now you need to deflate the total of fixed and variable costs by that same cumulative inflation rate. That is simple math: from the sum of all operating costs (not system improvements and related to-be-incurred debt), subtract the operating costs for the year you are going to reset rates (let’s call those the “current” operating costs), then divide that by the same year’s operating costs. That will give you the overall inflation in operating costs over that period of time.

For example: The “current” operating costs will be \$100,000. Five years from now the operating costs are projected to be \$125,000 (a simple 5% annual rate). The formula becomes $(\$125,000 - \$100,000) / \$100,000 = 25\%$. Thus, you need to reduce the total future fixed cost by 25% and the total variable cost by 25%. Note: This formula does not consider when the cost increase will happen, so net revenues may not be quite accurate. But it will likely get your rates into the right ballpark.

Now you can do the final minimum and unit charge math on those deflated sums.

The minimum charge would be the sum of the deflated fixed costs divided by the number of bills you will send out during the “current” year. Note: To be conservative, this assumes no growth in the customer base.

The unit charge rates would be the sum of the deflated variable costs divided by the number of billable units (probably 1,000 gallons or 100 cubic feet) you expect to sell during the “current” year. Again, no growth is assumed.

Such simple rates will work just fine for very small utilities or those with very uniform customers, usually almost all residential and no big commercial or industrial customers. And

commonly, very small communities are also growing slowly or even losing connections, so system development fees and growth in the customer base and usage are not issues, either. Now I need to rain on your do-it-yourself parade a bit.

If you or management wants in-town and out-of-town rates, or a usage allowance, or a unit charge that varies with the volume used, or a minimum charge that escalates with meter size, or you are having rapid growth, or you need big system improvements, rates for those situations will take growth projections, improvement plans, detailed usage data and strings of dependent formulas to calculate. That is not a task you can take on using something you read in a magazine. Remember, the M1 Manual is hundreds of pages long. And it is all important stuff.

I describe all these rate setting theory, strategy, and policy issues not to scare you away from rate setting. Rate setting must be done, so you may as well do it right or get it done right. To set rates well, you need to figure out where you want to go and assess the “landscape” between here and there. If you are satisfied that the current rate structure is “fair enough,” for next year’s rates, just increase the current rates by the percentage that next year’s budget will be higher than this year’s actual expenses. And if your system and customer base is small and uniform, doing basic calculations described above may take care of your rate setting needs.

But if future costs are going to change dramatically, that means the cost structure will change dramatically. In that case, somebody has got to do some serious math to calculate the way to the desired destination – fair and adequate rates. If you have not already developed a calculations template – a map – to navigate to your destination, you might get lost. And you might get a tongue lashing, or worse from ratepayers about the rates you propose. That is why I recommend this.

Call the Association. Tell them your situation and ask for their advice. They may say, yes, go the do-it-yourself rate calculation route. It’s good enough for your situation and you are quite capable of doing the math. Or they may be able to help you through a more complex situation. Or they may recommend you contact a rate analyst, so someone who has done this before can do the heavy lifting for you.

Whatever you do, do NOT just ignore the rates problem. Rates never get better on their own.

Carl Brown is President of GettingGreatRates.com, which specializes in water, sewer, and other utility rate analysis. The firm serves as the RATES Program rate analyst for the Arizona, Colorado, Kansas, Nevada, New Mexico, North Dakota, Virginia, and Wyoming rural water associations. Contact: (573) 619-3411; Carl1@gettinggreatrates.com

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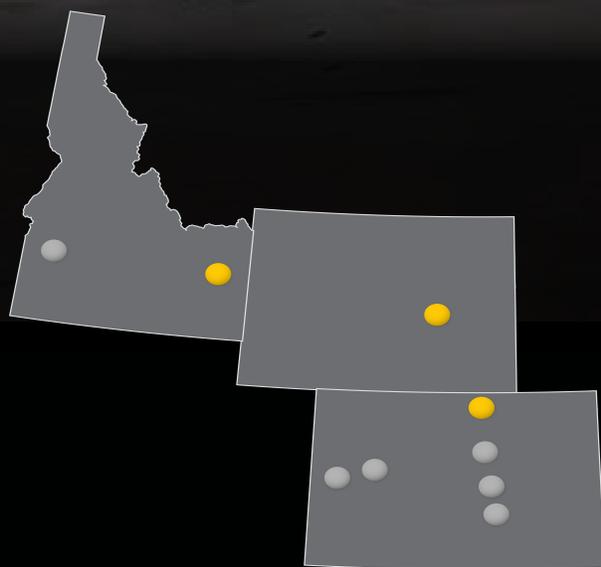
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