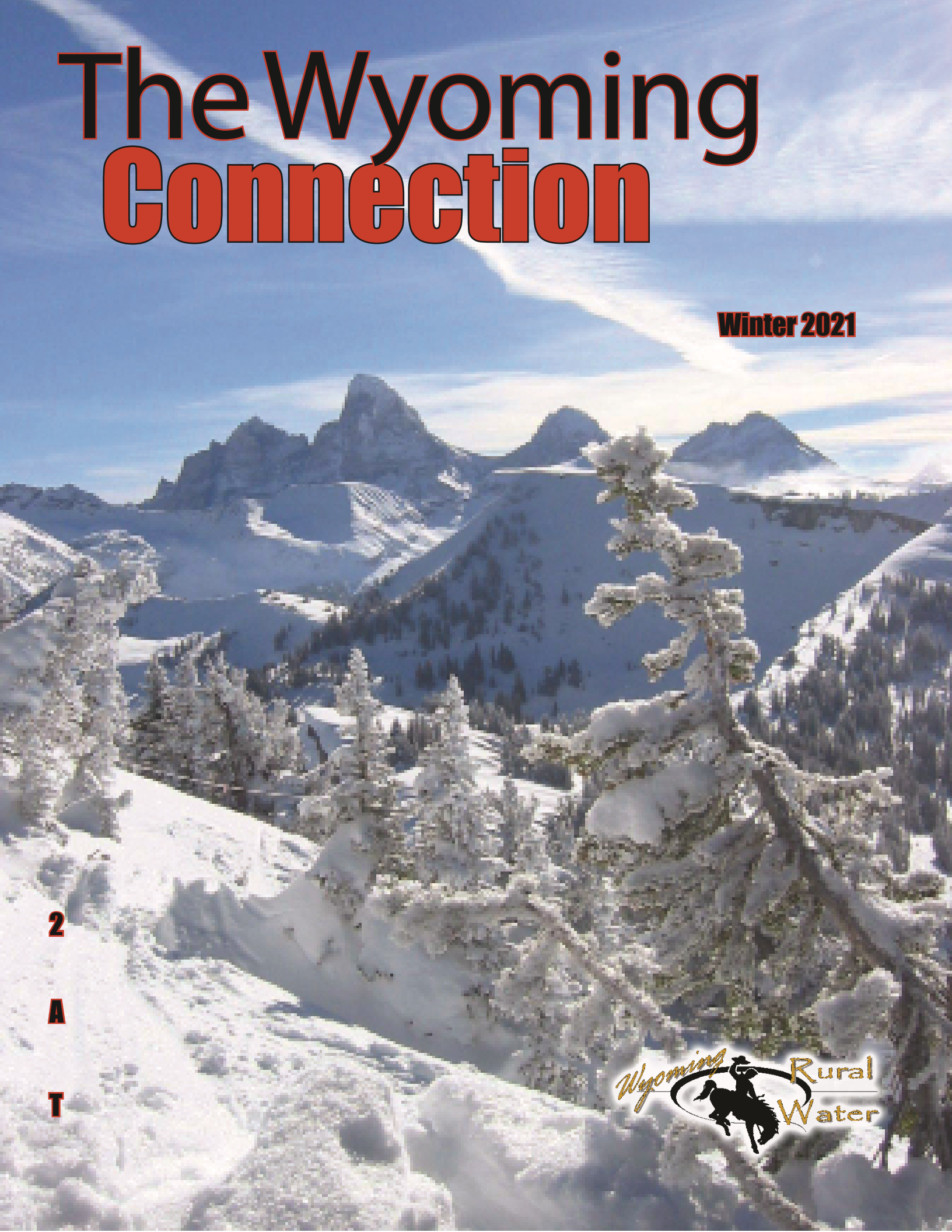
The Wyoming Connection

Winter 2021



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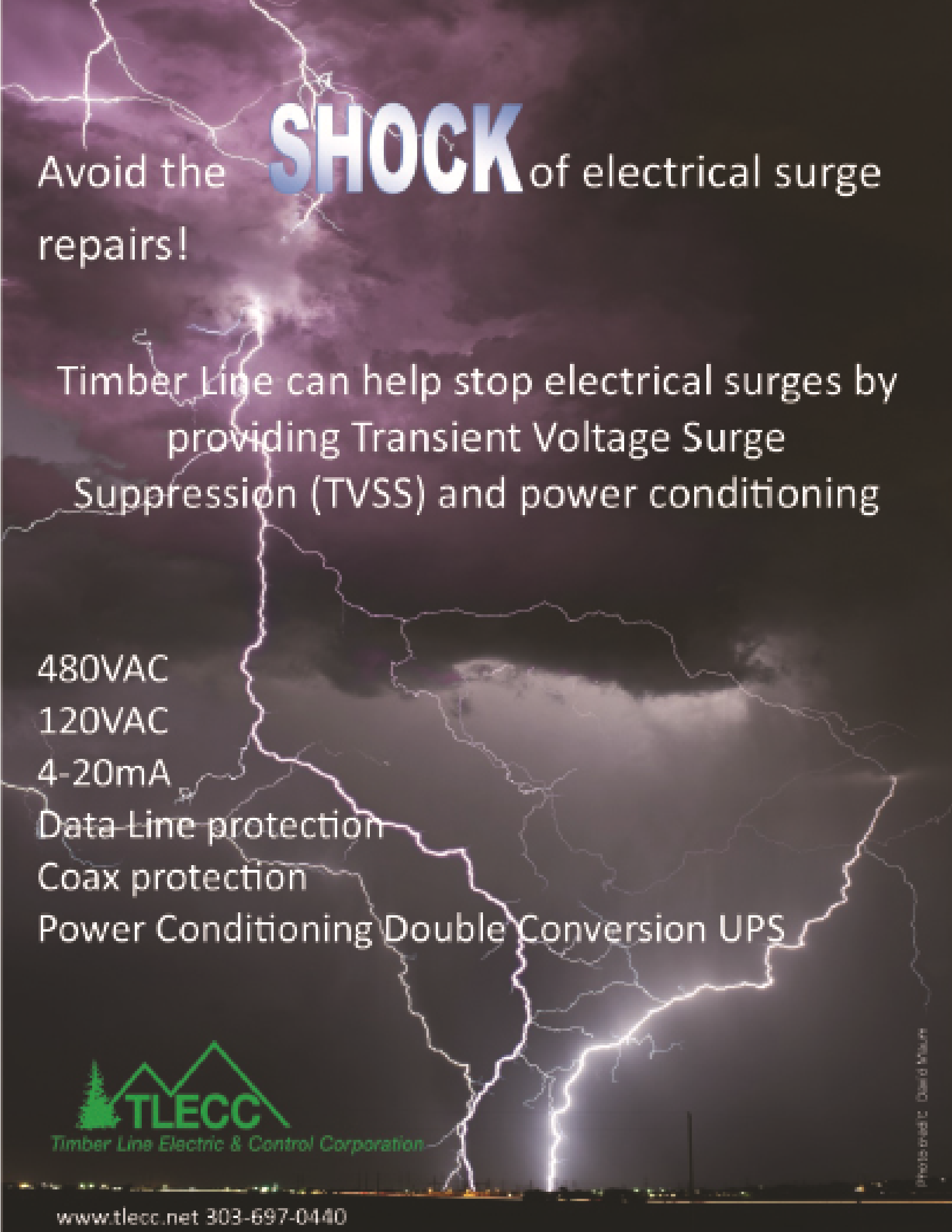
Wyoming Rural Water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Winter 2021- – Issue 120

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Wyoming Rural Water

Contents and Features

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 Tetons from the back side, photo by Mark Pepper.

NRWA NATIONAL RURAL WATER ASSOCIATION
America's Largest Utility Membership

WARWS' Mission:

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.

A Note From Mark Pepper

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2021 – Hold my beer!!

Well, as you read this, it will be 2021. I saw a great cartoon a little while ago, the 2020 "baby" having become an old beat up shrivel of a man is talking to the 2021 incoming "baby". The old man says, man, I'll bet the whole world will be glad to see me go! What else could go wrong? The 2021 baby says, HOLD MY BEER!!! (although my friends will know, it is a glass of whiskey for me)

I know one thing, whether it is/was 2020 or 2021, we all had good, clean drinking water to maintain sanitation and hydration and it was no small task! Many water systems had to go to extraordinary measures to keep the water flowing. Rotating small staffs, only allowing "call outs", rotation meter reading, staggered office personnel, among many other creative strategies to make sure that water operations staff were safe, available and kept that great water on tap!

As you read this, many of these strategies are still in play as we all await a vaccine that may put this nightmare behind us. A lot of work will need to be done should, let's hope when, we can get back into full operational mode. A lot of delayed maintenance, upgrades, betterments will commence. Thanks to legislation passed in 2018 and 2019, many innovative funding programs should be in place and ready to see projects go forward.

A lot of good legislative work has taken place in 2020 in spite of work from home, lack of travel and at least once for me, a very inappropriate hacking of a hearing on zoom I was a part of. While somewhat humorous, it did put an end to a very productive hearing for about a week. It did highlight one aspect of "infrastructure" that will be at the forefront in the year(s) to come, add additional bandwidth to the list of needed infrastructure projects. Out here in Wyoming, I've beat on our legislature, regulators and Governor that we need a lot more reliable, accessible connectivity!! The pandemic certainly showed the need.

If anything has taught us about the digital world, it has been this pandemic. The need for greatly expanded bandwidth to handle new strategies in training, education, and technical assistance, to name a few. The ability to maintain distance and utilize tablets to stream or video issues with pumps, lift stations and many other mechanical issues to dial in a fix or isolate the need for an "in person" inspection and correction proved to be a very cost-effective strategy.

As Yakov Smirnoff would say, "what a country!" This virtual/video technical assistance also allows us to "zoom" in mechanical experts, vendors and regulators creating quicker and hopefully more cost-efficient analysis and possible resolution.

Virtual training is useful in allowing a lot of people to get the necessary hours and topical training while allowing for decreased travel costs. Utilizing both in person and virtual can allow us to bring high quality, topical training to a particular region allowing for decreased travel while allowing operators to keep closer tabs on their systems. Virtual training also had the unintended benefit of increased efficiency allowing operators to train while never leaving home. After class, if needed, they could check tank levels, pumps or troubleshoot issues.

2021 will continue to utilize more effective staffing utilization, digital technical assistance and virtual training to address cost cutting measures while maintaining the professional needs that allow all of us in this great profession to maintain "Quality on Tap"!
Mr. P.

A Note From

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Covid-19 Circuit Rider

Well, we did it. Another year has gone by, and for most of us it was contentious and surreal at best. My first words are Thank You. Thank you for your dedicated service in keeping quality water and treated wastewater flowing for your towns and systems. I know the atta-boys are few and far between, but here is one.

During the past year. I have contacted over 300 plus systems by phone or in person and have engaged in some great conversations about water and our experiences doing the job. I have spoken with operators, mayors, councilmen, engineers, and town clerks. With the knowledge we have shared, I will be able to provide assistance when the occasion arises.

Wyoming Rural Water Circuit Riders and staff are here to assist all of you by providing information and experience to guide your way through the water processing dilemma. We would like to be the first step in your problem-solving quiver. Our new Mini conferences are a big hit for most of you in acquiring the hours for recertification.

Because I do not know what 2021 will look like, I will be on my phone and in my truck traveling the digital and asphalt highways of Wyoming. I would like to gather information from you on what you would like to see in the columns of our magazine. Text or email me your thoughts so I can provide an outlet. There are many questions I have received from operators and town government officials that could be answered through this forum.

With the pandemic still holding a grip on our nation and the travel restrictions endured, I have made a commitment to keep my family and you safe. I have taken the Moderna vaccine and had no adverse reactions. I know this is an individual process and I agree, it is everyone's choice, but here is my reasoning for following this course of action. I am 74 years old and want to live a lot longer, to be with my wife and family in the future, to fly my hang glider and paraglider, go camping, boating, snowboarding, keep doing the things that keep me moving.

I know that the vaccine will only protect me from getting the virus and possibly dying from it. Great reason!! Also, I know that there is a chance that I can be exposed and unknowingly spread the virus because I can still be asymmetric. But by taking the vaccine I am assured that I will be around for my family and grandkids.

In my youth our nation was faced with other illness that was scary to say the least. Polio is the one that comes to my mind vividly. One of my best friends succumbed to it and died. During this time, we were not given a choice when the vaccine became available. As children we were given a sugar cube vaccine in schools to stop its grip on us. And I am thankful for the adults in the room for that. During my time in the Navy, I was subject to being vaccinated with all kinds of things to be safe wherever they sent me. We did not have a choice to say no. Line up and get it was the order. I am sure glad they did it because I survived to live to this old age.

Well, enough said on that, so let us get started creating a new page. Let us get our new water operator recruits trained and certified as soon as possible. You know the Oldtimers in this business are getting tired of all the long hours and need a break. We need new blood to carry the mantel of Water/ Wastewater professionals.

How are we going to recruit new blood? From within our towns and communities. Homegrown employees make the best employees. During my 40yr tenure at Dayton, Wyoming I had the privilege of organizing field trips for school children. I introduced 1st graders thru seniors in high school to the fascinating world of Water every year. I watched some of the children grow curious each year and started to mentor the ones that kept coming back. This is how we retain our workforce within our communities.

Our industry needs employees in every state. Certified Licensed Water/Wastewater Operators are not a dime a dozen anymore and the small towns are realizing it. City and town employers are finding out the cold truth that getting qualified help from outside is almost impossible. To work in a small town, you must embrace the community, because in most cases you are the first one the residents call when they have a problem. You become the Water Guy to them, and they begin to trust you and your ability to process clean and safe water. And in turn the residents communicate that to your bosses. If you do your job with the community in mind, the promotions and salary increases will follow. If your town sees you as an asset instead of an employee, they will do anything to keep you happy.

The whole water industry is needing a shakeup and this pandemic has shown how valuable we are. Your sacrifices keeping the water flowing by planning and creating ways to get the job done during times like these are being recognized. City leaders are starting to understand that your value needs to be compensated to a higher level.

Operators Corner

Wastewater Questions by Mark Court:

1. Double-wall chemical storage tanks do not need to be placed within a secondary containment structure.

a. True
b. False

2. Low-density fats, oils and grease (FOG)

a. Are not removed in the secondary system and will pass through the system.
b. May create poor settleability in the secondary system.
c. Enhance activated sludge settleability by promoting flocculation
d. Promote assimilation of nitrogen that is used for cell growth in the biological nutrient removal process.

3. Phosphorous accumulating organisms are cultivated for which of the following?

a. Denitrification filters
b. Anaerobic digestion
c. Conventional activated sludge process
d. Biological nutrient removal

4. If a wastewater environment has no dissolved oxygen but has nitrate, it is described as which of the following?

a. Aerobic
b. Anaerobic
c. Anoxic
d. Hypoxic

5. In an activated sludge plant design for phosphorous removal, biomass can contain what percentage of phosphorous?

a. 1 to 4%
b. 2 to 5%
c. 3 to 6%
d. 4 to 7%

Water Questions by Michelle Christopher:

1. Which of these water quality characteristics will negatively affect disinfection efficiency?

a. pH of 6.8
b. high turbidity
c. low dissolved solids
d. long contact time

2. How are manganese greensand beds regenerated?

a. Backwashed with a finished water containing a solution of manganese oxide
b. A solution of manganese oxide is applied through the inlet
c. Backwashed with a permanganate solution

d. Air backwashed, then the desired dose of permanganate solution is applied at the inlet

3. Where are air relief valves commonly installed?

a. Next to a check valve to eliminate or reduce surges
b. On the discharge side of a well pump
c. At the high points in transmission lines
d. Both b and c

4. To prevent leakage at the point where the shaft protrudes through the case, either ____ are used to seal the space between the two

a. Packing rings or mechanical seals
b. Lantern rings or mechanical seals
c. Shaft sleeves or lantern rings
d. Lantern rings or packing rings

5. Find the drawdown of a well if the well yields 206 gpm and the specific yield is 14.8 gpm.

a. 13.2 ft
b. 13.9 ft
c. 14.3 ft
d. 14.7 ft

Answers

Wastewater
1. B
2. C
3. D
4. A
5. B

Water
1. B
2. B
3. D
4. C
5. C

To calculate the drawdown in feet, divide the flow (gpm) by specific yield (gpm/ft)

$$206\ \cancel{gpm}\left(\frac{Ft}{14.8\ \cancel{gpm}}\right) = 13.9\ ft$$

A Note From
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Secondary Biological Treatment (Part 3.4)

Activated Sludge (Process Control)

Operators Control

With the activated sludge process, the operator is limited as to what can be controlled. In fact, there are only three things an operator has control over in an activated sludge plant. With such limitations, it is extremely important to pay close attention to details and have years of trending models so when a particular situation occurs, the necessary steps can be taken to correct the situation before it gets out of control.

The first control is to maintain an adequate dissolved oxygen (DO) level. In your large plants, controlling oxygen levels is at the tip of your fingers. In many of the smaller domestic wastewater plants, there is little need to control DO. Most of these systems are designed with little or no dissolved oxygen controls. The operational consideration for these systems is to make sure the DO level never drops below 1.0 mg/L. In most cases, this is probably not an issue, but what about during those times when wastewater with high biochemical oxygen demand (BOD) comes into your plant unexpectedly? What if the wastewater coming in is highly toxic from an unknown source? How long will the plant be upset without the ability to control oxygen in these smaller activated sludge plants?

The next control in an activated sludge plant is the ability to control your mixed liquor suspended solids (MLSS). The concentration of mixed liquor is controlled by the rate of wasting in the plant. The best case scenario is to waste one pound of old sludge for every pound of new sludge that is produced. The best wasting control is daily removal of small amounts of sludge. If the MLSS is reduced to too low of a level, the microorganisms will go into a logarithmic growth and produce poor settling sludge.

The final control the operator has is the return sludge. The return sludge ultimately is used to control the level of sludge in the clarifier. The rate of return sludge from the final clarifier to the aeration basin is expressed as a percentage of the raw wastewater influent. For example, if return activated sludge is 30-percent and the wastewater flow is 10 MGD, the recirculation flow equals 3.0 MGD. With return activated sludge comes the risk of having improper return flows. If your return sludge flow is too high, the excessive hydraulic loading on the aeration basin will push the sludge out of the basin and into the clarifier resulting in an increase in the sludge volume in the clarifier which will reduce the MLSS in the aeration basin. On the flip side, if the return rate is too low, the majority of the organisms will end up in the aeration basin which will reduce their growth rate. This will result in the production of an old appearing and poor settling sludge.

If the return sludge flow is too high, the excessive hydraulic loading on the aeration basin will push the sludge out of the basin and into the clarifier. This will increase the volume of sludge in the clarifier resulting in the reduction of MLSS in the aeration basin. This will result in an increase of bacterial growth and poor settling sludge.

Variations of Activated Sludge

There are several variations to the activated sludge process. These variations can be defined around the physical design, flow patterns, hydraulic and organic loading as well as operational parameters. There are only four popular variations to small activated sludge plants. They include conventional plants and extended air plants.

Conventional Activated Sludge

The term conventional activated sludge plant is defined around operational parameters of MCRT and F/M ratios. For a typical domestic wastewater plant that is about 20°C (68°F), the conventional process operates with a MCRT ranging between 5 to 15 days and a F/M ratio of 0.2 to 0.5 lbs BOD applies/lb MLVSS/day.

Extended Aeration

One of the basic operational variations for small plants that do not receive 24-hour operator supervision is the extended aeration process. Extended aeration occurs when a plant is operated at the lowest successful range of process load. These plants are very conservative in design. They generally operate with an MCRT of 20 to 40 days and an F/M of 0.05 to 0.15 lbs BOD applied/lb MLVSS/day based on typical domestic wastewater at 20°C (68°F). Some manufacturers claim that wasting isn't necessary for extended aeration design. The fact is, after extremely long periods of aeration, suspended matter remains in the effluent. It is not necessary to waste daily, but occasional wasting will provide the best effluent quality.

Contact Stabilization (Doughnut Plants)

One of the popular doughnut plant designs is the contact stabilization plant. In fact, I have a very fond memories of the ***Doughnut Plant*** as it was the first wastewater plant

I was introduced to when I first began in the industry in 1998 in Lyons, Colorado. This plant utilized two aeration basins. One basin is usually twice the size of the other. The smaller is called the contact chamber and the larger is called the reaeration basin. This system also utilizes a larger than normal final clarifier.

In the contact stabilization plant, raw sewage is mixed with the mixed liquor for twenty minutes up to one hour in the contact tank. During this timeframe, the bacteria pick up food in their slime layers. The mixed liquor is then sent to the clarifier for compaction.

In the second step, the sludge is removed from the clarifier and sent to the reaeration tank for two-hours where the bacteria and other organisms complete the treatment process. The mixed liquor in the reaction tank is then mixed with raw sewage at the influent of the plant and the cycle starts all over again. The mixed liquor from the reaction tank is mixed with raw sewage at a rate of three to five gallons of mixed liquor for every ten gallons of raw sewage (30% to 50%).

The key advantage of the contact stabilization process is the ability to hold larger than normal volumes of sludge in reserve in the reaeration basin. This allows the operator to deal with shock loads. In communities where weekend populations are significantly larger than the week day population benefit from the contact stabilization plant. On the flip side, the major disadvantages to these systems are the amount of quality and process control, as well as operator time the system requires.

Package Plants

The term "package plant" refers to the configuration of an "all-in-one" unit. Package plants do not generally have primary clarifiers. The remaining process units are typically contained in a single large rectangular or circular tank.

Rectangular plants have a separate headworks and digester. The secondary clarifier is fastened directly onto the end of the aeration basin. The more popular package plant is the circular plant which is also referred to as a doughnut plant. These facilities contain aeration basins, a digester and a chlorine contact chamber built around a circular clarifier. The clarifier is the center or the hole of the doughnut. Many times flexibility has been built into the package plant so it can operate as conventional or extended aeration.

A Note From
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Wildfires and Watersheds

Fire is an integral part of our western landscape. Many of our wildland communities evolved under fire and require fire for regeneration of the vegetative community. But… while fire is necessary, and even beneficial in the long-term, it can create devastating effects for ecosystems and drinking water systems to deal with.

As fires destroy the landscape, vegetation is burned, creating a release of carbon and other nutrients that were once tied up in grasses, shrubs, and trees. Ash, debris, and sediment are moved during the first flush event. A first flush event could be a rainstorm or rapid snow melt event following the fire. Because the vegetation is no longer available to tie up the sediment, turbidity from erosion upstream will also increase.

In addition to increases in visible contaminants, invisible contaminants also increase. Nutrients that were once tied up in plant matter is released and washed downstream. Post-fire monitoring of water quality reveals that increases in nitrates, carbon and other nutrients should all be expected.

Fire intensity plays a direct role in the amount of nutrients released. Low intensity fires that do not completely burn vegetation release less nutrients than high intensity fires that not only burn above ground vegetation but roots and soil organic matter as well. In addition to degraded water quality from physical effects from fire, there may be chemical effects as well. With the change in water chemistry, minerals can be leached into the stream from the parent geology. Chemicals used to fight the fires can be washed into the streams, further increasing nutrient loading, or adding toxins to the environment.

In addition to wreaking havoc on water quality, fires can alter the physical characteristics of the landscape as well. When the vegetation canopy is destroyed, there is no protection of the soil from leaves, grass or trees against violent thunderstorms and erosion is increased. With the tree canopy reduced, there is also no shade to slow snowmelt, so runoff cycles become more rapid, with higher peak flows. Intense fires destroy the microbiology, making it difficult to get plants to re-grow. Loss of microbiology and organic matter also reduces the soil's ability to hold water, increasing runoff during and after precipitation events.

As catastrophic fires become increasingly common across the Western landscape, it is imperative that communities that rely on surface water for their drinking water source assess this resource and look for ways to become resilient. (It's actually part of the AWIA requirements, if your system is over 3,300!) Communities should assess their water source, not only considering the physical infrastructure, but the watershed as well.

Partnering with local land managers such as the BLM, USFS and NRCS can assist with evaluating the watershed. Important questions to ask include, "What is the fire potential in my watershed," "How can negative impacts from wildfire be reduced or mitigated," and "Is my system ready to respond to water quality changes, post-wildfire?"

Another important question to ask is, "Who can my system partner with?" Watershed management and assessment can be daunting, particularly if you do not own much land within the watershed. Developing a working relationship with landowners and managers is a great place to start. Maintaining good water quality is a common goal for most land managers, since clean water is one of the foundations of a functioning ecosystem. Other partners could be other drinking water systems in the watershed, state and federal

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.

agencies, or non-governmental organizations like The Nature Conservancy.

After working with land managers, a plan can be made to achieve the goal of reducing negative wildfire impacts to the watershed. Actions such as fuel reduction, creation of buffer strips or wetland restoration can be proposed. Stream structures that trap sediment and debris could be created. A response plan should be considered as well – if there is a fire, what do you do next? While it is difficult to predict what the fire will do, there are basic actions that should be taken after a fire.

First, monitor. As soon as it is safe, get out in the watershed and assess the damage. Did one side get burned worse than another? How close is the most damaged area to your intake? Has there been any infrastructure damage? Would adding monitoring sensors upstream help you make decisions in the treatment plant?

Second, triage. What is the risk of a debris slide damaging the intake? Can erosion protection such as straw bales or wattles help? Is your facility prepared to deal with flow changes due to thunderstorms, rapid runoff, etc? Do you have an alternate source available? Federal agencies such as the USFS and BLM utilize the Burned Area Emergency Response (BAER) to help decide where they can best take immediate action to prevent further damage to life, property, or natural resources. A BAER response could include hydro mulching highly erodible slopes or road drainage modifications.

Finally, restore. This is a long-term process that could include addition of biosolids, replanting desired species to reduce the spread of weeds, rebuilding roads, trails, and fences, etc. As with any restoration project, monitoring is critical to the long term success of the project.

Wildfires in Wyoming are on the rise, particularly large scale, high intensity fires. Of the 23 counties in Wyoming, 18 ranked wildfires as a high or medium risk to their communities. As the wildland-urban interface increases as development continues and our climate skews towards hotter, drier summers, it will become increasingly important to consider how wildfire can impact water quality along with the community at large. There are some great resources out there, including the Wyoming State Forestry Division https://wsfd.wyo.gov/home, USEPA https://www.epa.gov/sciencematters/wildfires-how-do-they-affect-our-water-supplies, and the US Geological Survey https://www.usgs.gov/mission-areas/water-resources/science/water-quality-after-wildfire?qt-science_center_objects=0#qt-science_center_objects for starters. If you'd like WARWS to assist you with starting the conversation with your decision makers, we'd be honored to do so.

WYOWARN is a group of Wyoming water and wastewater utilities that cooperatively prepare for the next natural or man-made disaster by bridging political and jurisdictional boundaries through training, protocols and agreements so that utilities can respond to disasters by sharing personnel, tools and equipment.

Why do we need WYOWARN?

Water and wastewater systems provide for public health, sanitation and safety. When water and wastewater systems fail, the well-being of communities quickly deteriorates. Without clean water and ways to remove and treat wastewater, communities become susceptible to disease and illness. The lack of water constrains emergency services such as medical response and fire fighting. In these conditions, people become frustrated and fearful.

Restoring service restores hope and the ability of a community to respond to natural of man-made disasters. Neighboring utilities already have the trained staff familiar with Wyomiing Water Quality Rules and Regulations. They are familiar with western water systems and are already prepared for and accustomed to Wyoming weather. They already have the specialized equipment needed for testing, pumping, or repairs and may have backup supplies of pipe, valves, chemicals, generators, etc., readily available.

While it is already the Wyoming way to lend a hand to our neighbors when they need it, having procedures and responsibilities spelled out ahead of time prepares us for the day when we need it. That is what WYOWARN is about – preparing utilities to help each other in the event of an emergency.

Not a member yet? Join WYOWARN!

1. Visit the WYOWARN website at www.WYOWARN.org and click on "Become a WYOWARN member Today!".
2. Download the Wyoming Mutual Aid and Assistance agreement.
3. Obtain necessary permissions to sign the Mutual Aid Agreement
4. Sign and return the agreement to:

Wyoming Association of Rural Water Systems
PO Box 1750
Glenrock, WY 82637
or e-mail a scanned copy to:
markp@warws.com

A Note From
Ross Jorgensen
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307-251-2803

Managing Your Monitoring/Sampling Requirements

Over the years I have been requested to assist new Water Operation Specialists with collecting their EPA required testing. Many times I see that they have waited until the last year of the monitoring period and have to collect all samples at the same time.

Now, although you can get everything done at one time every three years, this is not good O&M budget management. The cost of sampling for IOCs, VOCs, SOCs, Radiochemicals, Lead & Copper and Asbestos (for those with AC pipe) all at one time adds up quickly to over a few thousand dollars that will take a big chunk out of your operating budget during that year. For a small system this is a big deal. I remember having years that I could have used extra funds to get us through the last month or so of the fiscal year without putting off needed work until next year.

Not only does this type of budget management reduce O&M funds available for repairs and upgrades that year, but Council & Board members, particularly new members will (and should) question this big expenditure every time. When spread out over three years the boards/councils expect to see a consistent budgeted amount every year. It also helps the clerk/bookkeeper in the yearly budgeting process.

This can be frustrating when you have to ask your clerk/bookkeeper and board/council to amend the budget to get your O&M budget through the rest of the budget year. A budget amendment is not only additional time consuming work for your clerk, but an added expense because of required advertisement of public notification because the budget is being changed.

The alternative to the budget amendment and what happens most of the time is the board says no to any amendment to the budget because it is not considered an emergency expenditure, but rather poor budget management.

First thing to consider when breaking down your monitoring schedule is to take a close look at the requirements already set by EPA or your state primacy agency.

First, take into account that you will have monthly Total Coliform and yearly Nitrate. This is a set cost you will see every year. You should also plan on extra TCR testing for in the event of a positive TC sample. One positive TC means additional samples taken that can add up quickly.

Stage 2 Disinfection By-Products will vary depending on the system. Right now the testing cost for TTHMs and HAA5s is arouns $300.00 or more depending on how many you need to take.

For surface water and ground water systems under the influence of surface water that are either already on or will be put on quarterly testing need to budget about $1200.00 plus postage every year for this requirement. Groundwater systems under a population of 500 will be taking one pair (1 TTHM & 1 HAA5) will need to budget $300.00 for this test next year with some small systems only required to sample once every three years.

Although Lead and Copper testing is once every three years, the testing is to be exactly three years apart unlike the other three year testing requirements. In Wyoming which year lead & copper is tested is set by Region 8 EPA. Small systems under the population of 500 are required to take 5 samples, over 500 goes up to 10 samples. The larger the system population the more the number of samples increase in increments of 5 samples.

Where you have flexibility is with the required IOC (inorganics), SOC (pesticides), VOC (volatile), RADs (radio chemical) and Asbestos testing where you have to test within a three-year period.

SOCs (mainly pesticides) are about the most expensive test. I would always do this test in a year that I had no other pre-set required test except Total Coliform and Nitrates.

I worked with my testing lab to figure out which test I could take in which year to spread out water testing so I could budget about the same amount every year. Most Labs will assist with budget pricing to spread these costs out over three years and even set up automatic shipments of bottles in the year and prior to the month(s) your monitoring/sampling is due. If you can get this set up remember that you are still ultimately responsible that the right test is taken at the correct time.

I discovered that when I started down the road to having a consistent yearly budgeted/expended amount for water/wastewater testing that it got me looking at all the other consistent, reoccurring cost with supplies, fuel, electrical and heating costs. A little bit of planning for these costs will go a long way in managing your budget. It also improved my working relationship with my board and made it a little easier on my clerk/bookkeeper.

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They Support our Association. Please support them!

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Alyson Degnan 866-686-7175

Engineering Associates
Cody Schatz 307-587-4911

Falcon Environmental
Jared Keating 303-720-2790

Ferguson Waterworks
Dale Christianson 307-441-6055

FUSE IT Pipe and Supply
Ringo Dooley 406-245-6572

GettingGreatRates.com
Carl Brown 573-619-3411

Great Plains Structures
Guy Pence 480-665-6809

Hawkins Inc
Ross Lehner 406-855-5599

HOA Solutions, Inc
Jeff Hohnstein 402-467-3750

Hose Solutions
Venkat Srinivas 480-607-1507

Hubbell Lenoir City, Inc
Veronica Krenzel 630-234-5655

Inberg-Miller Engineers
Katie Pivik 307-856-8136

Industrial Service & Supply
T.G. Bles 888-253-7122

Intermountain Sales, Inc
Joel Pauling 303-885-6718

isiWEST
Frank Henderson 307-460-0125

IXOM / Medora Corporation
Craig Steve 833-826-0499

Jorgensen Associates, P.C.
Brian Gray 307-367-6548

JVA, Inc
Josh McGee 970-225-9099

Larson Data Communications, Inc
Mike Larson Sr 866-996-5521

Leak Locators of Montana/Sewerin
Mike Carothers 406-223-2508

LGLP
Judi Just 888-638-1911

M.C. Schaff & Assoc, Inc
Mike Olsen 307-635-1926

M&H Kennedy Valve
Darrel Moore 970-697-8175

Maguire Iron, Inc
Kal Tucker 605-334-9749

Midco Diving & Marine Services
Greg Lakey 605-791-3030

MISCOwater
Scott Perry 303-309-6150

Morrison-Maierle, Inc
Terra Zowada 307-577-0450

Mountainland Supply
Jason Faigl 307-371-9991

Mueller
Mike Uthe 406-223-2192

Native Energy Solutions, LLC
Mykel Sanner 307-277-3923

Neverest Equipment
Jim Clarke 720-352-2382

NorMont Equipment Company
Luke Stewart 406-453-4344

North Fork Engineering LLC
Jon Nelson 307-326-5000

NorthWest Pipe Fittings
Hoby Hogue 406-252-0142

One-Call of Wyoming
Jan Warren 307-778-5210

Pace Inc
Samantha Colbrese 406-252-5559

Pipestone Equipment
Jeremey Peterson 406-206-1555

Pittsburg Tank and Tower
Patrick Heltsley 270-826-9000 x228

Premier Power Plants & Pumps
Travis Hueller 307-273-9591

Process Specialties, Inc
Ernie Estrada 800-238-7400

Process Technology, Inc
Aaron Mooney 720-471-2457

Repmasters
Jon Davis 303-286-7575

RFC Consulting, LLC
Roger King 970-223-1803

Russell Industries Inc
Tristan McKinney 307-265-9566

Santec Corporation, Inc
Eric Ness 303-660-9211

Sargent Drilling
Shad Yarrington 308-872-5125

SCG Enterprises, Inc
Roger Shafer 303-619-2158

Sensus a Xylem brand
Erik Ongstad 206-331-1228

Spectrashield
Dan Sundvick 904-419-4889

Streamline Sales & Marketing
Frank Espiritu 720-237-9667

Subsurface, Inc
Tanner Sorlie 605-430-2017

Succentrix Business Advisors
Wade Hirschi 307-885-1040

SUEZ Advanced Solutions
Tom Stechmann 855-526-4413

Sunrise Engineering, Inc
Mark Davidson 307-775-9500

TDMA
Tom Noel 303-989-7737

Team Lab Chemical Corp
Tim Swanson 800-522-8326

Timber Line Electric & Control
Kim Evezich 303-697-0440

USABlueBook
John Schwartz 209-329-1620

Veris Environmental, LLC
Luke Bond 303-898-8819

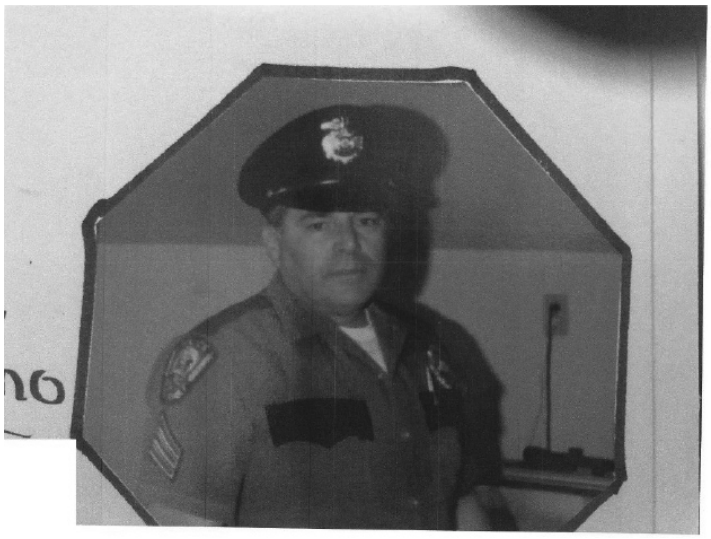
Western Research & Development
Lou Harmon 307-632-5656

W F I
Todd Simon 970-842-3508

WLC Engineering & Surveying
Jason Meyers 307-266-2524

WWC Engineering
Jeff Barron 307-672-0761

Yellowstone Waterworks
Cavin Noddings 406-633-2316



Anthony Michael Rigano (Tony)

was born July 2, 1937 in Chicago, Illinois and departed this earth on November 13, 2020 in Bairoil, Wyoming. Tony was preceded in death by his parents: Josephine Lena Patera Rigano Scelsi and Antonio Rigano and his son Anthony M. Rigano. He is survived by his wife Sue Ann Moon Rigano; children: Corrine (Mike) Conner, Lisa (Tony) Gilbert, Rebecca (Bill) Harshman, Jeff (Jenny) Evans, Jason (Jennifer) Evans. There are fifteen grandchildren: Anthony, Zach, Jolene, Jessie, Elizabeth, Jay, Alix, Mason, Noah, Nick, Aaron, Taylor, Kayson, Tre & Jaedan; nine great grandchildren: Emily, Hollyn, Nora, Grace, Gideon, Olive, Anthony, Gabby, Kimber. In addition is his in-law family (the Moons).

Living in Illinois, Tony worked in law enforcement and construction, but he always dreamed of moving to Wyoming to hunt and fish. He moved his family to Rawlins in 1975, where he started his construction business. His construction legacy is the multiple homes he constructed in Rawlins and Jeffrey City, in addition to commercial work throughout Carbon, Fremont and Sweetwater counties. In 1985.

Tony moved to Bairoil to serve the town as part time officer which later transitioned into the Chief of Police position (serving a total of 26 years and retiring in 2011). He also served collateral duties as maintenance man, certified water/sewer administrator, and part time Sweetwater County deputy. In the mid-1990s, he served as a part time police officer for the town of Superior, Wyoming. Tony was instrumental in establishing the Sweetwater County Solid Waste District #2 in 1993 and served as a board member for 15 years.

One of Tony's passions was that of hockey. He played on leagues in Illinois, skated on whatever ponds he could find and taught all his kids to skate. In Rawlins, he volunteered as coach of the Rawlins Raptors junior hockey league and made sure the kids in Bairoil had a place to skate. Going on to play in the Wyoming Games and several hockey leagues he finally retired his skates in his late 70s. Another skill he mastered was that of shooting sports winning numerous awards starting in 1964. One we are most proud of is his WLEA "Peace Officer Basic 86-02 in recognition of excellence as the top shooter".

Tony was a perpetual student of written history and often spent time writing memoirs and stories. Many of the family's memories revolve not only around Tony's sense of humor and storytelling, but of his integrity, honesty, and hard work ethics.

Memorial services will be held later in Spring/Summer 2021 due to the current Covid situation. In lieu of flowers, memorial donations may be made to the Tony Rigano Memorial Fund at the Bank of Commerce (Rawlins, Wyoming). Jacoby Funeral Home is in charge of arrangements. Tributes and condolences may be offered online at www.jacobycares.com.

A Note From

Joe Dankelman
State Small Circuit Rider
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307-439-9065

Well Issues That Could be Avoided

The deep subject that helps us provide water to our customers. Whether your system serves a hundred people or well into the thousands, protect this vital resource at all costs. In my travels this year, I have found more than one system that has major well issues that could have been avoided. One in particular stands out above the rest. This system is a small community that scraped together enough money to upgrade their entire system through grants and rate increases. The only problem was that their new well only lasted a little more than six months.

For this small community, their new well was desperately needed. The system had been running on a couple of wells in the past, and as fate would have it, one of their primary wells went down for good. So, after going through all necessary rules and regulations, the system started the upgrades. During the construction, the system suffered several loss of pressure issues. Of course, not many records were kept up with over the years. This led to many main water lines being found with a backhoe, and we all know just how much fun that can be. In some areas proper disinfection may have been impossible for various reasons. A flushing program could not be done from a lack of water storage and pressure issues. This is just another system I've visited that has no - to really bad maps of where their lines actually are. These breaks also helped provide the system with some nice LOV's for Total Coliform samples. On the bright side, their well house/ treatment plant and new storage tank were just about completed.

The well driller, from what I heard, was one with a great resume from past projects. Of course, this came from the systems engineer, so it did come with a grain of salt. At times it is all too easy to bash the engineers on a job, but this time it may be justified. Not being on site during most of the construction, it's hard to say what happened for sure. I did ask a few simple questions that may seem to be no brainers, but the replies were a little vague, to say the least. Was the equipment used to drill the well disinfected since the last job? Did the pipe string sit on the ground during the construction of the well? Did anyone disinfect the pipe string / wiring before it went down hole? Was the casing left open during construction? To these questions, I heard that the well was used for all the disinfection requirements after completion. "Oh, don't worry we hot dosed the well, and nothing could have lived through that." Really, so what was the dose that you hit the well with? "Oh, hot for sure" Fast forward to the present, and the system had to shut in the brand new well because of high Iron Bacteria counts which were well over thirty thousand CFU. This then caused an extremely high sulfur smell to become present in the potable water. To be fair, the well did pass all the testing requirements and produced good water for the better part of six months. At some point my guess is that the iron bacteria helped form sulfur reducing bacteria which may be causing the horrific sulfur smell. Not disinfecting the materials before going down the hole is just a bad idea. How long did anything get a chance to grow and hide in the formation where dosing the well did not kill it? Until a more detailed water sample is done and a treatment process is established, the well is shut in. The worse part for the system, is now even more money that they do not have must be spent to fix an issue that could have been avoided. That brand new well being down is altogether a very sore subject.

Sad to say, this system is not the only case I have seen this year. A small NCNT system had their well videoed, and common sense was again ignored. The camera and cords were never disinfected before going down hole. Worse yet, they were spooled out all over the ground before going down hole. If that was not bad enough, this all happened while an engineer was watching over the job. The last case that I'll share today was a system that had their wellhead right by the horse pasture. The yard hydrant coming up through the cap turned out to be a horrible idea. Past not having any backflow protection, the split cap allowed the well to test positive for E-Coli. So after a visit from the EPA and many water samples later, that yard hydrant was removed and a new well cap sealed the deal.

At the end of the day, protect your well as you would a newborn child. As an operator, if you are on site and see something not going right, stop the contractor. Always err on the side of caution and ask plenty of questions. At the end of the day, if your source water gets contaminated, nothing but problems will occur. On our web site, there are many links that give out plenty of tec tips on well head protection, and construction standards. DEQ chapters can be found on SEO link. SEO go to Environmental Quality (020) go to Water quality (0011) this brings you to chapter 26. Also, research chapter 11, for more details for standards. Know your well day, Well Head Protection, Water Well Records (pdf) are just a few more tec tips that can be found on the site. For the new operators or operators who haven't had the pleasure of going through a new well construction project, you can always contact our Circuit Riders for assistance. Michelle Christopher, Ross Jorgensen ,and Johann Nield are all great resources just waiting to help.

As always please stay safe out there in these crazy times of 2020, and have a great and Happy New Year!

A Note From

Kathy Weinsaft
Training Specialist
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307-262-3943

Resilience

We do 'Risk and Resiliency' plans. We assess our sustainability and resiliency. Resilience was the buzz word of 2020. When I look back over this 'dumpster fire' of a year, it seems to me that anyone that has lived through this has demonstrated their resiliency. What exactly is resiliency? To quote American futurist Jamais Cascio: "Resilience is all about being able to prevent or overcome the unexpected.

Sustainability is about survival. The goal of resilience is to 'thrive'. Customers value reliability, especially when you are providing an essential service and I am hard pressed to think of a more essential service than water during a pandemic. We are resilient by nature here in Wyoming or we wouldn't survive a winter or fire season, but this is a good time to review areas of our operations to make sure they are up to snuff. We can always do things better and there is nothing better than a life threatening event to focus one's mind on those things.

Review your key internal policies. These include your sick pay system, health and safety rules, travel policies and how you would cover forced absences from work. Employees need to know where they stand. They trust messages from their managers, so tone, accuracy and relevance can make all the difference. Clearly communicate what your people should do if they feel unwell and tell them what is happening with travel bans, sick leave, work-from-home, hygiene measures, annual leave and strategies to keep the system operating effectively.

Make sure you plan for the unexpected consequences of the COVID-19 pandemic for your system. Think about how your budget will be impacted if large users are not operating. Inform your customers of any change in your services. Customers may need extended terms from you and some communities have stopped all shut offs. Keep an eye on your revenues and expenses and start looking for trends.

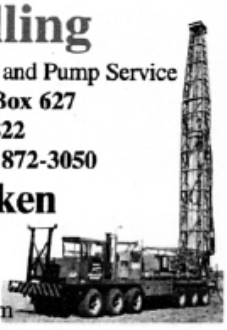
On the other end of this is your suppliers. They may require different arrangements because their business has changed too. Communicate early and often with them. This pandemic has demonstrated how fragile our supply chain is whether that be for kale or chlorine. Don't take chances going into winter. Make sure you have every thing you need for a spell. Check and make sure you have sufficient resources and supplies and whether you have the space to store them. Prepare for shortages and price volatility for sure.

Ensure that your cyber risk policy is up-to-date and has been communicated to your employees. If you don't have a policy, there is no time like the present to develop one. It needs to be included in your Risk and Resiliency plan anyway, so there is no way to get around it. It is a sad thing, but there are people out there taking advantage of the pandemic to get you to click on the wrong thing. These are some sophisticated tactics they are using. I got hacked, and it was a nightmare. If you need help, let WARWS know. We have resources that we can get you hooked up with and we will continue to do training on cyber security.

Bandwith and reliable service will continue to be a challenge for us Wyomingites as we do more and more with cyber technology. I was teaching a class for New Jersey Rural Water this spring when the net went down, not only in Wyoming, but Colorado as well. My back-up was to call in my presentation. That worked until Verizon went down. My back-up to my back-up was to use my land line. That worked until my battery went dead in my landline phone. You get the idea. Have multiple plans and be ready to switch to them on a moments notice.

Communication is key, whether it is to your staff, your suppliers, or customers. Be transparent. We are all being deluged with a fire hose of information that changes more often than we change our socks. Be honest when the information you receive changes your response. Nothing is written in stone.

It is frustrating to not know what tomorrow is going to bring or when this is all going to end. Take some deep breaths and take it one day at a time. Don't hesitate to give me a call if you are confronted with something that is challenging to deal with. I may not have the answer anymore than you do, but I am more than willing to help you think through any situation. Hang in there. There are better days to come and I for one am ready for them.



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National Rural Water Association

www.nrwa.org/gocanvas
www.gocanvas.com/nrwa

Spring Spall Fall – Training is a coming.

With continued travel restrictions and in person gathering restrictions still in place, we have decided to postpone the 30th Annual Technical Assistance and Exhibitor Conference from our usual April time frame to the last week of August (August 24th-27th, as we did last year). We plan on taking advantage of the better weather window to offer more outside training options and events.

Let's hope that vaccine distribution and continued vigilance will combine to have things getting back to (some) normal over the summer. To paraphrase Igor in Young Frankenstein, "I am about done with ABBY normal".

For those who may want training hours prior to August, Training Thursday were presented February 4th, 11th, 18th and 25th and will continue into March on the 4th, 11th, 18th, and 25th. We are also planning on a "virtual mini conference" in April and will be doing mini's in November and December. We might squeeze one or 2 more in as needed.

Kathy is also planning on quite a few 1 day or a few, hour long webinars and virtual classes so you will have plenty of opportunities during 2021 to get your training hours. Mr. P.

Board of Director Openings

Every year, the Wyoming Association of Rural Water Systems has board of director elections depending on the Region of the state of Wyoming for Board seats that are at the end of their term. These are 3 year terms and there are currently no term limits. Board members must be employees, elected officials or designated representatives of a voting member system (PWS's that are eligible for USDA RD funding typically serving populations under 10,000). The organization's By Laws define voting member as Non-profit public water, wastewater, associations, districts, municipalities and (or) other types of public utilities of any size with 10,000 or less population, engaged in the transportation, distribution and/or sale of public utility services in the rural areas of the State of Wyoming.

Board members provide oversight of and direction to the Executive Director on policy issues/items including budgetary, program, legislative and professional direction. Board members receive no direct compensation for serving. Board members are reimbursed for travel expenses to attend official association meetings, can attend in person conferences and training sessions at no cost including hotel and per diem. Board members can attend virtual training sessions at no cost.

For 2021, 2 region board seats are up for election. The Southwest region (Teton, Lincoln, Uinta, Sweetwater and Sublette counties) and Northeast Region (Sheridan, Johnson, Campbell, Crook and Weston counties). Currently the Southwest Region is represented by Mr. Ron Overson who currently serves as Board Secretary. Ron is the Utility Manager for Grand Targhee Resort in Teton County. The Northeast Region is represented by Mr. Dan Coughlin who currently serves as Board Vice President. Dan is the Project Manager of the Sheridan Area Water Supply JPB in Sheridan County.

Mr. Overson has expressed his intention to NOT run for re-election. Ron has served since 2009 and believes it is time for new perspectives on the Board, as well as needing to concentrate on work commitments. Mr. Coughlin has expressed his intention to run for re-election. Mr. Coughlin has served since 2018.

Those interested can contact Mark Pepper, Executive Director for more information. A letter of interest must be received by March 31 to be included in Business Meeting materials distributed to voting member delegates. The Annual Business Meeting does entertain floor nominations for Board seats as well. The Annual Business Meeting will be held virtually prior to May 31st, 2021. Announcements for the Annual Business Meeting will be made during the first 2 weeks of April per the By Laws.

Mark Pepper, Executive Director

CONFERENCE REGISTRATION

30th Annual Technical Conference

August 24th-27th, 2021

Ramkota Hotel and Conference Center, Casper WY

Name for Badge: _____

Your Employer: _____ 5 Digit Operator ID# REQUIRED _____

Your Title or Position: _____ Daytime Phone: _____

Billing Address: _____

City/State/Zip: _____

Bill my employer: _____ Pay with credit card: _____ E-mail confirmation to: _____

Personal address to receive our magazine: _____

Email to receive training and other notifications: _____

I plan to attend only the Pre-Conference on the 24th (No Fee) _____

FULL REGISTRATION August 24th - 27th, 2021

(Includes Pre-Conference, all classes, Exhibit Hall, meals and breaks, and **Certification processing**)

Member – Early Bird, payment included (By 7/15/21) ..... $395 _____

Member – After 7/15/21 ..... $445 _____

Non-Member Early Bird, including a new Individual Membership through 12/31/21..... $505 _____

Non-Member after 7/15/21, including a new Individual Membership through 12/31/21..... $555 _____

Decision Maker / Clerk ..... $150 _____

I plan to bring a water sample for the 'Best Tasting Water in Wyoming' contest (circle one) – YES NO

One-day only registrations	**Member**	**Non-member**
Wednesday only: (classes, lunch, Exhibit Hall, Game Night)	$225	$250 = $ _____
Thursday only: (classes, lunch, Exhibit Hall).....	$225	$250 = $ _____
Friday only: (buffet breakfast, classes)	$155	$185 = $ _____

Additional meal tickets, for guests, will be available at the Registration Booth

Refund policy: No refunds after 7/15/21. Amount can be credited to a future event

Total $ _____

If paying with a credit card, please complete the following:

Master Card or Visa Number: _____ Expiration date on card: _____

Name (exactly as it appears on the card): _____

BillingAddress: _____

Host Hotel:

Ramkota Hotel & Conference Center – $80 room rate

800 N. Poplar, Casper, WY 82601

Reservations: www.ramkotacasper.com (307) 266-6000

Return this form with payment to:

WARWS, PO Box 1750, Glenrock, WY 82637 (307) 436-8636

or Fax (307) 436-8441 or Register on-line: www.warws.com

Wyoming Association of Rural Water Systems

30th Annual Spall Conference – BOOTH REGISTRATION

August 24th - 27th, 2021 Ramkota Hotel and Conference Center, Casper, WY

Please print legibly or type:

Company Name: _____

Mailing Address: _____

City/State/Zip: _____

Telephone: _____ Fax: _____

Type of Product/Service: _____

Name(s) and emails of those attending: _____

_____

_____

Exhibit Hall – 8' x 8' space, 6' skirted table, pipe and drape, 2 chairs, wireless internet, meals for two. If you have more than 2 representatives, a fee of $40 per representative will be charged.

1st, 2nd, 3rd request for booth # _____, _____, _____

Note: Some booths are numbered the same as the sleeping room right behind it. If you choose one of those booths, you must also take that sleeping room. Reserve the room by emailing Megan Miller mmiller@ramkotacasper.com.

ASSOCIATE MEMBER – EARLY BIRD REGISTRATION by 7/15/21:
Member Exhibit Hall ___ x $475 _____

ASSOCIATE MEMBER – REGISTRATION after 7/15/21
Member Exhibit Hall ___ x $600 _____

NON-MEMBERS – EARLY BIRD by 7/15/21 (Includes non-advertising membership through 12/31/21 @ $350)
Non-Member Exhibit Hall ___ x $825 _____

NON-MEMBER – REGISTRATION after 7/15/21 (Includes non-advertising membership through 12/31/21 @ $350)
Non-Member Exhibit Hall ___ x $950 _____

NON-MEMBER (Does not include membership)
Non-Member Exhibit Hall ___ x $1,000 _____

SPONSORSHIPS Available – You do not have to be an Exhibitor to be a sponsor

(Company names will be listed in conference program and on signage)

Break/Food Sponsor ___ x $250 = _____

Game Night (Food and prizes): ___ x $100 = _____

Meals for representatives ___ x $ 40 = _____

Sponsorships packages available: email Mark Pepper – markp@warws.com

- Donations for door prizes will be accepted and appreciated

Total $ _____

- Refund Policy: No refunds after 7/15/21

If paying with a credit card, please complete the following:

Name (exactly as it appears on the card): _____

Billing Address: _____

Card Number: _____ Expiration date on card: _____

Host Hotel:
Ramkota Hotel and Conference Center – $80 room rate
800 N. Poplar, Casper, WY 82601
www.ramkotacasper.com or call 1-307-266-6000

Return this form with payment to:
WARWS, PO Box 1750, Glenrock, WY 82637 or
Fax: (307) 436-8441 or Register on-line: www.warws.com
For more information call our office at (307) 436-8636

Information, Motivation and Locomotion; Making Projects Happen

Carl E. Brown, President
Carl Brown Consulting, LLC

Rate Setting Best Practices

Carl Brown, President
GettingGreatRates.com

Author's note: This article is a summary of part of the "Rate Setting Best Practices Guide," also written by me. That guide covers a full range of best practices for utility rate setting, with much detail and explanations. The guide is available for free download at https://gettinggreatrates.com/Freebies.

Let's face facts. There are lots of bad utility rates out there, probably yours included (no disrespect intended – it just happens). Rates are commonly too low and almost always unfairly structured. Both can be fixed if you go about it the right way. This article will help you get started.

The mission of a public utility is to:

1. Provide a valuable service to the public,
2. Do it effectively, and
3. Do it fairly.

The public assumes you will accomplish Missions 1 and 2, and you should. Mission 3 is not impossible, but it is tricky. The following should help you succeed.

1. Abide by all state laws, bond agreements, agency regulations and anything else that governs how you set rates.
   This is kind of the "other duties as assigned" clause for utilities.

2. Be open and honest with ratepayers, when necessary, painfully so.
   Do this all the time. It will keep you on the straight and narrow. Your ratepayers will grow to appreciate it and trust you for it. Their trust and support are critical to the success of the utility.

Generally, **"bad customer"** means a non-paying customer. You will have some of those. It is just the nature of some folks. But don't unnecessarily create more bad customers.

3. Related to Best Practice Number 3, always keep the difficult-to-pay customers in mind when setting rates.
   I always consider the bill effect on the "little old lady, widowed, retired, living alone on Social Security." I advise client utilities to try to keep her bill from becoming unaffordable, turning her into a bad customer. That goes against the "everyone should pay their own way" notion, but proper rate setting is not purely about cost recovery.

4. Stop comparing your utility's rates to the rates of other utilities.
   If rates of utilities "down the road" are not sustainable, they will probably be unsustainable for your utility, too. One exception: comparing new connection fees is a reasonable exercise. Charge too much and development goes "down the road."

5. "Right-size" your rates.
   Right-sized rates are not too complex, not too simple, as close to a cost-to-serve structure as is practical and set up to serve the situations of the utility and its ratepayers.

"Rate analysis" considers all key rates-related issues over a five to ten-year projection period to arrive at a set of rates and fees that fully fund the utility and do it fairly.

The American Water Works Association describes "rate studies" as doing nearly as much as rate analysis. However, in common practice, things called a "rate study" often consider only one year and far fewer rates-related issues. Most do not classify costs to the customer level, which must be done if rates are to be fair at the customer level.

6. When it is time to get right-sized rates, get a good rate analysis done.
   A good rate analysis is useful for many things. Many, many things.

7. When your analyst says, "Adopt these rates," do it. Worst-case scenario: If the rates go wrong, you can blame the analyst and make them do it over.

8. If you are a rates adopter and you do your own "rate studies," stop that!
   Rate analysis is technical. Unless you are an experienced rate analyst, when you calculate rates, you are probably making errors. When you need surgery, hire a surgeon. When your car needs a new transmission, hire a mechanic who specializes in transmissions. When you need rate analysis, hire a good rate analyst.

Do-it-yourself rate studies?
Don't do it!

9. While you should not do your own rate studies, you should do your own annual incremental across-the-board increases during the years between rate analyses.
   Raise rates every year, at least a little bit. Inflation happens. Keep up with it. This is how you should proceed.

> Raise rates every year, at least a little bit.

   Step 1: Get a rate analysis done by a rate analyst, so you will know how high and how to structure rates and fees initially.

   Step 2: The next year at budget preparation time, calculate how much higher the budget needs to be compared to the current year's expenditures. When you adopt the new budget, adopt across-the-board rate increases that will fund that budget properly. Repeat Step 2 each year until the rate structure becomes unfair enough to make a new rate analysis worthwhile, usually in about five years.
   Going about rate calculations and rate adjustments in this way, the restructuring adjustments are calculated by the analyst, infrequently. The across-the-board increases are done by you each year as you prepare each budget.

> Think of the two steps like this:
>
> Step 1 is when a professional mechanic replaces the engine in your car.
>
> Step 2 is when you make sure you change the oil regularly, from now on.

10. You try to run a zero balance in the utility because it is a "non-profit." Stop that.
    Non-profit does not mean have no reserves. That is irresponsible.

11. On a related note, stop subsidizing one utility with revenues from any other utility.
    Every utility should pay its own way.

12. Stop including a usage allowance, "free water," in your rates.
    Water is not free, and it is not fair to "give" 2,000 gallons per month to all if not all use 2,000 gallons every month. Any usage allowance skews rate structure fairness.

> You can give water away, but that does not make it free.

13. Stop allowing new connections at low connection fee rates.
    Capacity to serve costs money. New connections should pay for as much of that cost as is practical.
14. Start assessing minimum charge surcharges that recover capacity costs proportionate to meter size.
    When there are several meter sizes on the system, or just a handful of large meters, meter size-based surcharges should be added to the base minimum charge to recover capacity costs.

15. Start raising rates every year, at least a little bit.
    Does this sound familiar? Then, do it.

16. Start planning for and costing out capital improvement program (CIP) expenses.
    Analysis is responsible only if it fully considers CIP needs. In fact, current or approaching CIP needs are usually the prime reason utilities request rate analysis – they need more money!

17. Start scheduling and costing out equipment repair and replacement (R&R) needs, for the same reason as CIP.

Excel spreadsheets to help you do CIP and R&R planning, scheduling and costing are available for free download at https://gettinggreatrates.com/freebies.

The full list in the guide goes up to Best Practice 42, so there is a lot yet to learn.

To get started setting proper rates, you should call Kathy Weinsaft at the Association and ask for rate setting help. If Kathy or other staff can help you, great. If not, she will probably refer you to me, through the Wyoming RATES Program. Visit https://gettinggreatrates.com/ and click the "RATES" dropdown. Kathy and I will make sure you get the right rates for your situation.

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

NATIONAL RURAL WATER ASSOCIATION

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NOW IS THE TIME TO ACT

Get Started on Your Water Utility Construction Project

Do you have a Water Utility Construction Project? Now is the time to act! Rates are at an all time low, and with the current pricing being opportunistic and taking action can result in benefits not only for your-self but for the customer as well. Consider the below items that detail positive reasons to act now that you can present to your governing body.

- Interest rates are at an all-time low.
- More project contractors are available, increasing the number of bids, potentially lowering project costs.
- Fuel costs are low, lowering pipe related costs.
- Most material costs for projects are down.
- Shipping costs for many have decreased.
- Road and water projects are easier to schedule due to decreased volume in traffic.
- Low construction costs and available contractors are not guaranteed to last.

USDA

USDA Rural Development is committed to helping improve the economy and quality of life in rural America. Offering loans, grants and loan guarantees are some of the ways Rural Development is supporting rural America.

Our Western Heritage

by Kathy Weinsaft

Wonderful Wyoming Winter

If you don't let the wind blow you over, winter can be the best season of all in Wyoming. Besides, it is the longest season, so you need to enjoy it.

I will admit to having been slowed down by the pandemic in an abundance of caution, but as soon as I can I am getting out and enjoying this beautiful state that I am so blessed to live in. If you are going to get out, be safe, and I mean more than social distancing and wearing a mask.

Before you head out, make sure to check to see what is open and what the road conditions are. If I had a nickel for every disappointed tourist I have run into in the winter thinking they were going to drive through Yellowstone, I would be a wealthy woman. Yellowstone is totally doable in the winter, but it is expensive and takes some planning.

Be sure that your winter pack is in your vehicle. Everyone's winter pack is as individualistic as the person that prepares them. It always makes me chuckle what different folks believe to be necessities. No matter what though, all packs should include flares, a first aid kit, blankets, extra boots, matches, a shovel, chains, food and water. Oh, and by the way, chains don't do a bit of good if you don't know how to use them. Some are definitely designed to be easier to use and they were worth the investment for me. Keep an eye on the weather and always have back up plans. Flexibility is a good thing and traveling in winter in Wyoming it is a requirement. Some of the best trips I have ever had weren't the ones I thought I was taking. Don't let winter stop you from some of the best times around.

Some of my favorite destinations are just better in the winter. They of course include hot springs such as the ones in Saratoga or Thermopolis. Really, is there anything better than sitting in a hot tub with snow gently falling and looking up and seeing a herd of deer leisurely feeding? I think not!

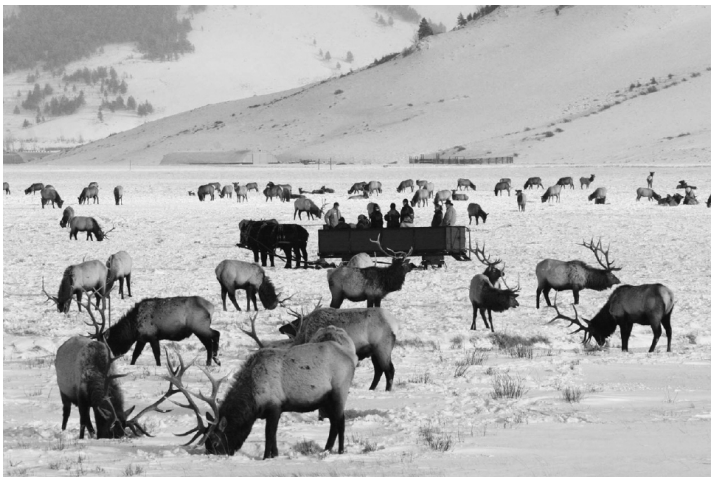
Well, now wait, maybe I spoke too soon. If you haven't gone on the winter sleigh ride at the National Elk Refuge, it sure would run a close second. You can ride out amongst the elk from December 14th till April 3rd. You can catch a ride everyday other than Christmas from 10am-4pm. Oh, my gosh, it is so worth it. While you are in the area, take one of the many horse drawn sleigh rides that are offered. Those jingle bells on the horses get me every time. It is very hard not to break out into Christmas carols when you are dashing through the snow.

Snowshoes are always in my winter pack. Getting into the outback and enjoying the silence and peace of a Wyoming winter is a gift. We have some of the best cross country skiing and snow shoeing in the world right here in Wyoming. One of my favorite snow shoe trails is around Sibley Lake up in the Big Horns at Burgess Junction. It consists of approximately 15 miles of groomed routes, ranging from 7,700' to 8,400' in elevations and offering a variety of loops and tours.

After you get off the trails be sure to stop at Moose Crossing at the Bear Lodge Resort. I swear they have the best apple or peach pie ever. Hey, it's okay, you burned plenty of calories out on the trails.

There are also some world class trails up on Casper Mountain, and they are even lighted in the evenings and they have a coco shack strategically located.

I love Wyoming in every season, but winter is incredible here. Please get out and enjoy it.



It is, after all, part of our western heritage

Self Portrait

Scrawny Girl's Ham Bars

by Michelle Christopher

Sometimes finding food to get excited about eating out of a pack is rough. Especially when it's lunch during hunting season. By October, I am so over eating trail mix, even if I've gone to extremes to make it exciting. Jerky? It's so July 2020. Granola bars? Yeah, not happening. Fruit snacks? Well… those I will always make an exception for. It's a marathon runner thing, evidently.

Enter the ham bar. This delightful savory sandwich bar is equally delicious eaten cold or warmed up over the defrost vents in your truck. John and I were first introduced to ham bars by my brothers, who would frequent the Mennonite bakery in Rawlins. The bars use an enriched bread dough as its base, and then covered with salty ham, cheddar cheese and pickled jalapeno slices. Because the dough has a serious amount of butter, these bars stay fresh for a shocking long time.

Recipe
Dough: This is a basic brioche dough, with more butter than I'd like to admit to using. It takes a very long time to rise, so if you can set this up to do the rising overnight, you could probably split the dough into cinnamon rolls and ham bars for breakfast and be somebody's hero.

- 2 tsp active dry yeast
- ¼ c lukewarm milk
- 2 tbsp sugar
- 3 eggs
- 2.5 c flour
- 1 tsp salt
- ½ c (1 stick) butter

Mix yeast, milk and sugar, and allow it to sit for 5 minutes until it foams up. Next, mix in the eggs until well combined.

If you have a stand mixer, mix flour, salt and liquids for about 5 minutes on level 1 speed. Begin adding butter in small pieces, and increase the mixer speed to a 2 for 15 minutes until you have a well combined sticky dough.

If you don't have a stand mixer, combine flour, salt and liquids and keep mixing until you have a sticky dough. Turn dough out onto a floured surface and stick the butter chips into the dough. Cover the butter with the dough and begin kneading. Pretend its arm day, and knead for 15-20 minutes, making sure that the butter is covered by dough when kneading. Avoid the temptation to continually add flour while kneading to reduce the stickiness. You'll end up with a brick.

Place dough in a greased bowl, cover with plastic wrap/ damp tea towel/ginormous plate and let it rise for an hour. If you live at higher elevations, or keep your house cool, my suggestion is that you let it sit for at least two. If you're in a tearing hurry, continue to the next step. If you have

excellent time management skills and patience, place dough in refrigerator for 4-16 hours. Or your garage, if it's winter in Wyoming.

The Bars
1 lb thin sliced ham
2lbs grated cheddar cheese – I prefer sharp, John prefers mild. We compromise with medium. Do as you see fit.
Pickled sliced jalapenos – I use a half pint jar.

Heat oven to 350 degrees

Line a 17 x 11 cookie sheet with parchment paper. Place dough on paper and begin gently stretching and pressing the dough into the pan. Arrange ham slices on dough, covering edge to edge. You could leave a perimeter like a pizza crust, but then someone gets shorted toppings on the corner slices. Cover ham with grated cheese and add jalapeno slices. I'll leave the amount and density of the jalapenos up to your heat preference.

Bake for 25-30 minutes. Because of the butter, sugar and eggs, brioche crust gets pretty brown before it's done.

Remove from oven, place pan on rack to cool, and slice. I tend to think that slicing a pan of this size into a 6x4 grid makes for a nice sized portion. Enjoy fresh, or allow to cool completely, wrap tightly in plastic and enjoy on your next adventure.

Assuring Safe Entry and Access to a Water Storage Tank

By Erin Schmitt, media director/technical writer for Pittsburg Tank & Tower Group

An old, riveted tank – often referred to as a "tinman" because of its resemblance to the famous "The Wizard of Oz" character – was badly in need of a paint job. Tinmen are elevated tanks, which carry more risks compared to ground tanks since there's a greater fall risk. It also means that any entry or exit points into the tank are much further from the ground. This tank located in California only had one entry or exit point – a roof hatch.

To safely complete a paint job or any maintenance or repair work that requires entering the tank, there should always be at least two ways of ingress and egress. So, to finish the tank job, the contracted company installed an OSHA-compliant manway on the tank's shell. The manway became the entry and exit for both the paint crew and their equipment, while they used the roof hatch mainly for necessary ventilation.

It's crucial to have large enough access points, a rescue plan in place, rescue supplies at hand, and for people responding to have undergone training for an unplanned water storage tank rescue. Manways and hatches are access points for inspections, repairs, and maintenance. Rescuers must have easy access through manways or hatches so that they can extract the person within a reasonable amount of time and prevent further injury if someone has had a medical emergency while inside the tank.

Accidents require investigations. Inspectors site code violations in their official reports. The tank owner or operator could then potentially be held liable for federal and state fines or be on the line for damages if there's a successful civil suit filed. Routine inspections from a state fire marshal on fire protection tanks could also yield fines for the tank owner if their tank is not up to code. It's better to make sure a tank is up to code before an accident happens than waiting until after the fact.

Two shell manways must be provided within the first ring of a tank shell, according to AWWA 7.4.4. One manway must be at least 30" in diameter and circular. The other manway has to be at least 24" if it's circular or 18" x 22" if its elliptical. If the access cover weighs more than 50 pounds, it should have a hinge or davit arm.

Manways should be located 180 degrees from each other. In a medical emergency, time is critical. For example, if someone suffers a heart attack, rescuers will want to lift the person through the closest access point. Being able to rescue a person quickly could make the difference between life and death. If there's only one access point, and, especially, if the one access point is blocked by equipment, it could waste precious time.

Painting requires blast hoses, paint sprayers, and often a fan to filter the air and keep the fumes down. All of this equipment must fit inside the tank so it can be repainted. If a tank is being sandblasted, a dust sock may be used at the manway to catch any sandblast debris. Hoses, fans, ventilators, and socks block or at least impede entry or exit, making it necessary that another access point be available. Some companies won't accept work unless there are certain safety measures in place on a storage tank. It's not worth the risk of having their employees paint or repair a tank without a viable exit.

Ground storage tanks are less hazardous to enter and exit because the manways are closer to ground level. For elevated storage tanks, any rescue attempts would require the rescuer to access the elevated structure before entering the tank.

There should be two openings on a tank roof. Ideally, that would be two hatches, both at least 24" wide. But one can be a vent if the vent is removable and provides a large enough opening.

An interior ladder is helpful to gain safe access if any work is performed inside the tank. That includes maintenance, repairs, or a routine inspection that's not utilizing a robot. OSHA compliant ladders must have standoffs every 10' on center and cable type ladder safety devices. A cable slide

is connected to the cable and the slide is hooked onto a climber's harness. Ladder guards prevent intruders from easily accessing the tank. Round ladder rungs don't offer an edge or grip of any kind, but anti-skid rungs do. They must also be at least 16" wide and should have anti-skid rungs to prevent slips and trips.

Steel that interacts with water without a protective barrier – think a tank liner for a storage tank – starts to rust and corrode over time. If the rusting isn't addressed, the ladder may deteriorate and become unsafe to climb. The ladder may become disconnected from its standoff, which is what connects the ladder to the tank shell. If that happens, it could damage the interior paint or even puncture a hole in the tank.

In colder climates, there's also the potential for a tank to freeze, causing the water to expand, and creating so much pressure that appurtenances can break off and damage the tank. These factors must be weighed when deciding whether to place a ladder inside a tank. As with anything, a little maintenance can go a long way.

Of course, there are tanks still in operation built before current standards were adopted. But, for safety reasons, the tanks should be upgraded to comply with modern standards as repair work is done.

FORD FLEET PROGRAM

The National Rural Water Association and the Ford Motor Company have created a partnership to offer special fleet discounts to State Rural Water Associations and their utility system members. This partnership combines the buying power of 31,000 individual utilities to provide reduced fleet pricing on utility vehicles. The Ford Fleet Team is #1 in commercial fleet customer satisfaction according to surveys. The Rural Water Ford Fleet Program is a valuable member benefit for water and wastewater utilities. State Rural Water Associations determine eligibility for their members, and provide a fleet code that allows access to substantial vehicle discounts to fill the need for reliable work vehicles. Fleet vehicles must be registered in the name of a member water or wastewater system.

Member utilities should contact their State Rural Water Association to access the Rural Water Ford Fleet Program. Vehicles may be purchased at your local dealer or through the national fleet auto group, get all the details you need online at: www.nrwafleet.com. Incentive discount pricing is available on fuel efficient cars, vans, SUVs and trucks. Systems can save up to $5800 off factory invoice per vehicle. Happy shopping!

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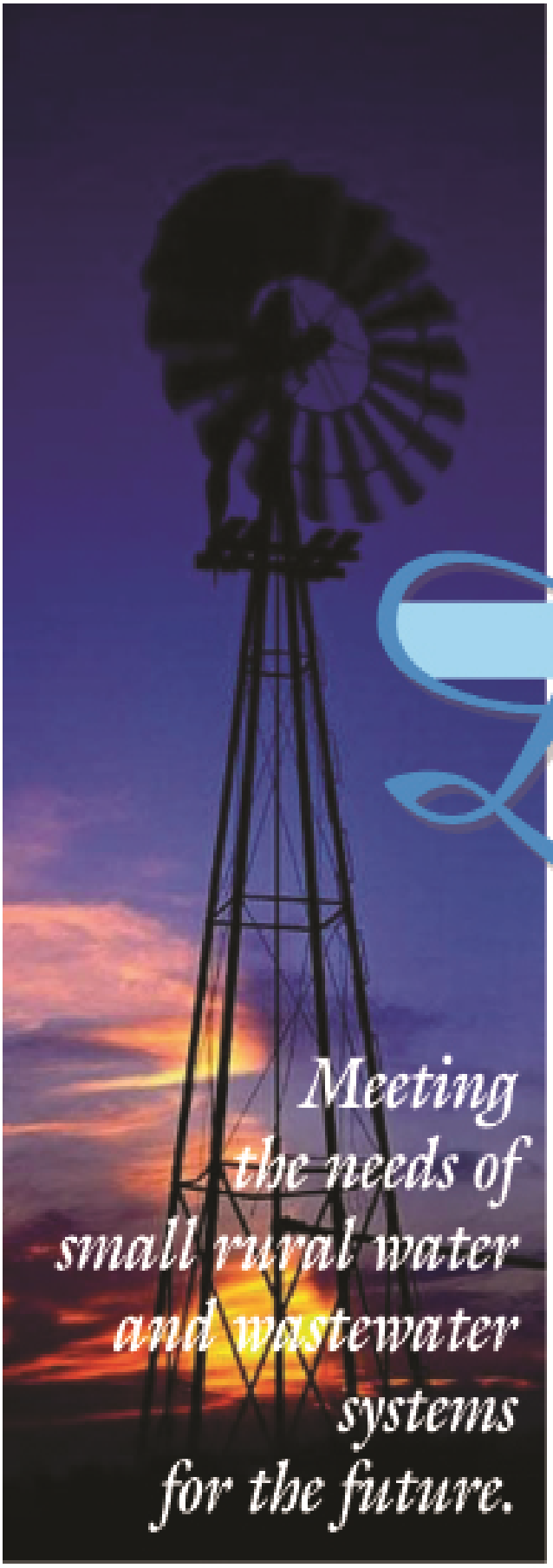
F-Series Super Duty F250-F550	$5,800
F150 4X2 Reg Cab	$4,100
F150 (Excludes Raptor)	$5,100
Transit Connect	$2,400
Transit 2WD	$4,200
Transit AWD	$3,500
Ranger 4X2 Crew Cab	$1,000
Ranger 4X2 SuperCab	$300
Ranger 4X4 Crew Cab	$1,700
Ranger 4X4 SuperCab	$1,400



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