Water Infrastructure and 2022 Critical Water Event Report

March 30, 2022

On Thursday, March 3rd, residents of Rawlins and Sinclair were notified that our water tanks were at critical levels and asked to limit water use except for vital needs. Still, our water tanks depleted, which resulted in a low-pressure event and the issuance of the required boil water advisory. **By pulling together, our community made it through the critical event, but we must stick together by conserving water for the long haul if we are to make it through the underlying problems.** We estimate it will take 3-5 years to make all necessary repairs to our water infrastructure.

We want to thank all the community volunteers, local and national non-profits, and County, City, and Town employees who worked tirelessly from March 3rd to 9th to ensure that residents of Rawlins and Sinclair were taken care of during the boil water advisory. The final page of this report attempts to thank everyone who stepped up to serve during the critical water event; if anyone is missed, it is only because our community's response was so tremendous.

We have heard from our community, and we empathize with you as we navigate this frustrating and disappointing situation. To quote Mayor Terry Weickum, "It doesn't matter who is at fault, knowing that wouldn't help fix one leak. However, I do know that it is our responsibility to fix it." Our Council and staff are doing everything in our power to repair our springs collection system in the Sage Creek Basin and the 32-mile pipeline which brings our water into town.

In the winter, our communities use about 900 gallons per minute of water during the winter. This averages to 1 million gallons of water per day.

During the summer, even when conserving, our communities use between 2800-4000 gallons per minute. This averages between 4-6 million gallons a day. This means that we average at least 4 times more water use in the summer.

As of late March, without the repairs made in the Sage Creek Basin to the 10,000 feet of woodstave pipeline, we are averaging 1500 gallons of flow between springs and wells. Although flow will increase with the wood pipeline replacement and with the spring thaw, you can see that we are currently significantly short of meeting our lowest typical summer demands. The reduced flow will be more problematic in 2022 as our reservoirs are not full, due to our repairs this winter.

The water supply to our community will be impacted until our infrastructure has been repaired. We will also be making ordinance changes to encourage water conservation, which will include water restrictions if necessary for health and safety. This is what you can expect for the upcoming summer:

First, your water is safe. The treatment plant is working, and you can drink your water without concerns. For more information, please review our Drinking Water Annual Consumer Report available at City Hall and at www.rawlinswy.org/watertreatment.

Second, you can likely expect water restrictions this summer. We are reviewing and updating the current water restriction ordinance. If we don't follow these restrictions while repairs are being made, we will not be able to meet water demand. In that case, the EPA will likely require we build a $10+ million chemical-heavy water treatment plant, which would be prohibitively costly.

1. Limit your water use. Examples include:
   - Water before 10 am or after 6 pm, including both lawns and gardens.
   - Water grass less often and more deeply.
   - If you wash your car, boat, etc. use a bucket and auto shut-off spray nozzle.
   - Do not use water to clean driveways or other exterior surfaces.
   - Do not water paved surfaces.
   - Use WaterSense products, or modify existing products if possible
   - Do not let the water run during tasks when not being used.
   - Make changes to make your landscape more water-friendly – more information from the Carbon County Extension Office at #5 below.

2. If a "Limited Water Use" alert is sent, please fully follow the guidelines. Such an alert will signify that the tanks are nearing a critical level, but if use is reduced a boil water advisory may be avoided.
3. If we go into water restrictions, please realize they are necessary for the safety of our community, treat them seriously, and act accordingly.
4. The Rochelle Golf Course uses untreated river water, and we are working to use untreated water for the cemetery. This will help reduce the demand for treated water.
5. There are several ways to help make water usage in landscapes more efficient. Improving soil health can reduce the amount of water needed to maintain turf. Adding organic matter to the soil increases water holding capacity and overall health. Aerating the soil can also increase soil health and water holding capacity. Watering in the early morning and evening with sprinklers that are low to the ground and have larger droplet sizes can decrease water lost to evaporation. The free water methods publication below goes into further detail on these topics. http://www.uwyo.edu/barnbackyard/_files/documents/magazine/2020/summer/0720savewater.pdf

   Adding mulch-like bark or shredded material to your landscape helps maintain moisture. It is a great addition around trees and in flower beds. Rock-type mulches tend to heat up landscapes, especially the undersides of leaves, ultimately requiring more water to keep plants healthy and happy. Drought-tolerant plants can be a good option but do still require regular water in the first 1-2 years to help them establish. Once established these plants could be watered on a separate cycle from turf, to reduce overall water usage. Tree species and selection can make a significant impact. Aspens and Cottonwoods are both water hogs and even tend to have more disease and insect problems than other tree species. Talk to the local Extension office about tree selection or any of these other ways to reduce water usage in your landscape if you want more information, 307-328-2642 or ajacks12@uwyo.edu.

6. Follow our website and other credible news sources for accurate and up-to-date information on the situation.
7. Check out these sites for some good advice: some of our favorites are wyowater.com/conservation-tips and the EPA WaterSense website and Facebook page.

What happened on March 2nd and 3rd, 2022?

On March 3rd, 2022, the City of Rawlins and the Town of Sinclair suffered a catastrophic failure of our water service delivery systems.

Since December, our community has been restricted to well and reservoir water, as repairs were made to the 32-mile transmission line. The City's water treatment plant was barely making enough water to meet the City of Rawlins and Town of Sinclair's daily water supply needs. As a result, storage was depleted in the tanks.

As we prepared to turn the spring line back on, our already depleted tanks were hit again. Overnight, the City crews experienced an extensive water break on the 6-inch line between Taco John's and Bomgaars. This was a full circle break, unfortunately on one of the few lines where we have not identified the shut-off valve. This break flowed for over 7 hours. There were also three small leaks in our community. These in-town repairs were all fixed by Thursday afternoon. Also, the Town of Sinclair's water tank has an auto refill and pulled water to fill their tank.

At this time, we also had a water treatment filter down. The line that brings water into the filter (a pre-coat line) was being repaired due to a previous crack. This is an integral part of the pumping system. The water treatment team was repairing the line so that it would be ready when the spring water made it to the plant. Between the limited water from the wells, a pre-coat line crack, and the draining of tanks, our water system emptied causing a negative pressure in the water system. This ultimately required the Boil Order Advisory to be placed per EPA guidelines.

A boil water advisory is issued by water utilities or health agencies as a precaution to protect consumers from drinking water that may have been contaminated. Boil water advisories are typically issued when an unexpected condition has caused a potential for biological contamination of water. Common reasons for a boil water advisory include loss of pressure in the distribution system, loss of disinfection, and other unexpected water quality problems. On March 3rd, 2022, there was a loss of pressure in the system, which was the reason for the boil water advisory.

For a boil water advisory to be lifted, the EPA must receive a minimum of two tests taken 24 hours apart showing no issues of concern. Testing cannot begin until there is sufficient water returned to the tanks and any necessary (cleaning) processes have taken place.

During and after a boil water advisory it is important to follow all recommendations for your health and safety. For more information, please visit https://www.cdc.gov/healthywater/emergency/drinking/drinking-water-advisories/boil-water-advisory.html

Community spirit prevailed as volunteers organized to pass out water at the fairgrounds and delivered it to those who couldn't pick it up themselves. The C4 (Carbon County Coordination Center) was activated to coordinate the response. Advisories were posted on social media, posters hung throughout town, and alerts sent by phone. Many organizations donated water and offers of help came pouring in from other municipalities. Our community rallied and people complied with the water restrictions (no bathing, no cooking, no laundry), and slowly our water reserves filled up. As the spring line to town was filling with water, two more Air-Vacuum valves failed overnight. Each failure caused a four-hour delay to allow for repairs. Maintenance crews worked tirelessly overnights in the snow, digging up pipes and trying to repair them. By 8:00 pm on Friday evening, full springs flow went to the water treatment for the first time since December. A sense of community and togetherness prevailed, and neighbors helped neighbors. The C4 Emergency Operations Center had over 99,000 bottles of water donated and care and concern for the most vulnerable and their needs were addressed by a volunteer corps of concerned citizens. Other community volunteers volunteered to staff the phones at the call center and pass along the advisories and instructions that were being given in response to this crisis. With the community conserving water and city crews working day and night, testing to remove the Boil Order Advisory was able to begin on Sunday and the Advisory was lifted on Tuesday afternoon. The extra efforts made by the community, staff, and the C4 ultimately led to the boil water advisory being lifted at least one day earlier.

The C4 is the new Emergency Operations Center funded by Carbon County and staffed during emergency situations by volunteers, private industry, and governmental staff from throughout the county. During this event, the C4 had over 30 people who worked to meet the needs of our community so that the City of Rawlins Public Works staff could focus on the repairs. The C4 Staff reached out to multiple Private, City of Rawlins, Town of Sinclair, Carbon County, and State partners requesting resources and sharing a common operating picture so that all agencies were working with the same understanding, aligned with the same priority to accomplish the same set of goals. Some of these agencies included local churches, city and county departments, Wyoming Highway Patrol, Wyoming Department of Transportation, Wyoming Office of Homeland Security, Wyoming EPA, Wyoming DEQ, and other local and state partners. For more information about the C4 or about volunteering, please contact Lenny Layman, Carbon County Emergency Manager at 307-328-2680.

What happened from summer 2021 through early winter 2022?

Since the summer of 2021, the City of Rawlins has been discovering and sharing information on the fragile state of our infrastructure which brings water from our springs and wells into our water treatment plant. The resulting reduction in water supply caused both the March 2022 boil water advisory and the Summer 2021 water restrictions. The City also funded and began repairs, applied for grants totaling $11 million dollars, and began developing the appropriate maintenance and operations plans.

Last summer, it was determined that our water infrastructure has severely deteriorated. The infrastructure is riddled with multiple leaks, miles of corroded pipeline, faulty blow-off valves, an antiquated SCADA (Supervisory Control and Data Acquisition) system, and 108-year-old wood stave pipelines and spring boxes. What we discovered on the 32-mile pipeline from the Sage Creek Basin to the water treatment plant was very discouraging.

1. Blow-Off Valves: There are valves that are used to divert water out of the pipeline to maintain and/or repair the line downstream. We learned that the valves had not been exercised (opened and closed) for an extensive period. Regular exercising is necessary to prevent sediments from collecting and causing corrosion. This also helps catch bad valves sooner so they can be replaced. There are 15+ valves on our line.

   While exercising the blow-off valves, the poor conditions were obvious and apparent. Although we unclogged some, many of the valves still cannot flow. The valves which did flow pushed out an excessive amount of mud. Of the 13 we exercised, two completely failed. The top/Bonnet screws were almost entirely consumed by rust due to the high alkalinity in the soil.

2. Cathodic Protection is a process in which a small electronic charge is put on the steel line to keep rust from setting in, which can damage the steel structure of the pipe. An outside specialist determined this process had not been working for up to 20 years. We can restore cathodic protection to the line, but it will not correct any rust damage that has already been done.

3. Air/Vacuum Valves: These valves are set at critical points to release pressure and ease water flow when filling or flowing the pipeline. Upon a visual inspection of the valves, we found several that had failed. These had been shut off, and not replaced, years prior to this event. They had also not been replaced as recommended. There are over 90 valves in the steel line.

The City council and staff identified and funded three major projects this winter:

1. Replacement of 10,000 feet of the main collection system in the Sage Creek Basin, from 100+-year-old woodstave pipelines to PVC during the winter (still in process).
2. Work on the 32-mile transmission pipeline. Repairs at this level to the spring line have never been done before.
    - City crews, RMI Construction Services, and F&S Welding/Trucking worked together to repair the Lone Tree blowoff and an additional break/blowoff valve one mile north.
        - Both repairs were plagued by the extensive existing flowing and groundwater, which made excavation dangerous and very difficult. With the recommendation of engineers and the city, we identified that these valves were in a dangerous location and should be relocated.
        - To save time, we eliminated these blow-off valve locations and capped the pipes. We will be moving these blow-off valves upstream to safer and more accessible locations.
    - Installed three new Air/Vacuum Valves: one at Sage Creek, one near Miller Booster Station, and one at the mid-point between the two.
        - To do this work, we had to turn off the water from the springs to the water treatment plant. At this time, we were forced to use only water obtained from our Nugget Well formation and utilize some storage water from our Peaking reservoir to keep up with the demand for Rawlins and Sinclair customers.
        - Because of the COVID restrictions, obtaining materials for our above-listed repairs took about 3 months, during which we continued depleting our storage. For example, one repair took days of calling to find the pipe in stock in Salt Lake City, so we made a special trip to retrieve the pipe. In another instance, we called our vendors to order and found out they had an 8-to-12-week delivery schedule. Our water treatment crew then spent the day calling and emailing every company they could find nationwide. Through their efforts, we located 6 Air/Vacuum Valves, 3 of which were overnighted and received the next day, and the other 3 were 10 days out. As necessary parts were received, they were assembled. To prevent this supply chain issue, we have purchased the extra materials necessary to repair our spring line.
    - Installed a pressure-relief hydrant. Also in this time, we installed a fire hydrant at the Miller Booster station, which will give us the ability to relieve pressure and allow water to come in from the springs, without having to turn off the water flow from the wells. Without the hydrant, the wells would have to be shut off and valves opened to the water plant as the spring line refilled to prevent a water hammer, which would damage or break pipes/equipment. With the hydrant in place, well water can make it to town while the springs water flows. The wells keep flowing, so when one valve closes the other opens for a continuous flow of water.

3. Replaced the screens in two of our four DE filters, as they were aged and slowed the process of treatment. At this point, the screens for one of the filters have been received.

<u>Introduction to Rawlins and Sinclair's Water Infrastructure</u>

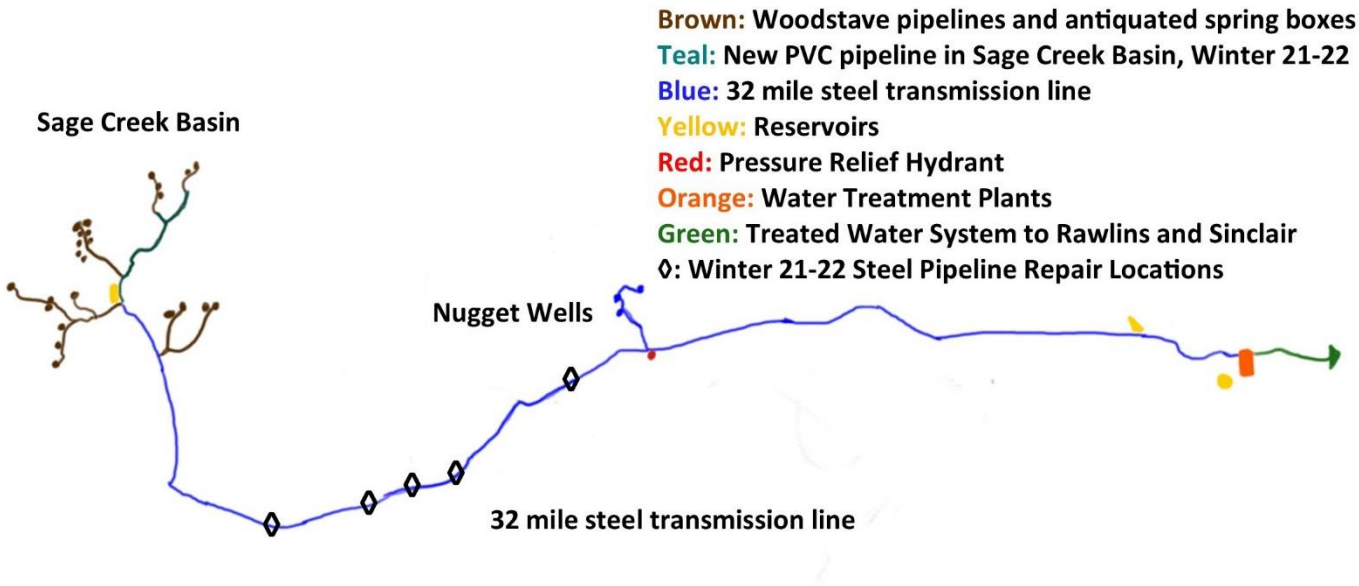
The City of Rawlins and Town of Sinclair obtain water for municipal purposes from the Sage Creek Springs, the Nugget Wells, and the North Platte River. Our water treatment plant uses one of the most natural and approved methods: Diatomaceous Earth (DE) filtration. This is followed by the required addition of chlorine for safety. DE Filtration produces high-quality, low-cost drinking water when a clean and abundant water supply is available. However, this system cannot quickly or effectively treat the turbid/cloudy water that comes from our reservoirs quickly enough to keep up with the outdoor watering needs of our community, which average 3-5x higher than our indoor winter use.

Traditionally we have been able to provide adequate water for heavy summer use because of our abundant spring water. As our infrastructure failed and less spring water made it into the treatment plant, we are now more dependent upon the turbid/cloudy water available from the wells, reservoirs, and river. Our current plant cannot treat the turbid/cloudy water fast enough to meet historic summer demand.

We have some mechanisms in place to assist the water treatment plant. This includes Atlantic Rim and Peaking Reservoirs where spring, well and river water can be stored in the winter to hopefully settle, making it cleaner and easier to treat. We also have a pre-treatment plant that we are working to bring back into operation, which can treat river water that has been settled in reservoirs. We use untreated river water to keep Rochelle Ranch Golf Course green and are actively working to bring untreated water to the cemetery. By using untreated river water for our green spaces, we can conserve our clear springs water for other needs.

Until our water collection infrastructure is repaired so more clean spring water makes it to the plant, we are unlikely to be able to produce enough treated water to meet historical summer use. If our community uses water more wisely while these repairs are made over the next 3-5 years, we will all benefit in the long run. **If issues that occurred in the last year continue, such as the turbidity notices and the boil water advisory, the Environmental Protection Agency (EPA) could direct us to build a conventional water treatment plant. This is a more chemical-based process and would likely cost tens of millions of dollars.**

Source Water Transmission Line Map



What repairs are the City planning to make to water infrastructure?

The City of Rawlins team is focusing our work and funds to remedy this situation and prevent similar issues for the next generation of our community. We have begun this phased project, which is initially focusing on emergency repairs, followed by later phases that will include the complete replacement of system components. Our focuses, in no particular order, include:

1. Repairs to the 32-mile pipeline from our spring and well water to the water treatment plant, including the key repairs to blow-offs, air release valves, and cathodic protection. This could also include the replacement of large sections of the pipe.
2. Replacement of the springs collection infrastructure in the Sage Creek Basin, including wood-stave pipelines throughout the Basin, spring boxes, and other upgrades.
3. Create a comprehensive and understandable operations and maintenance manual for our water system, and then perform and track the necessary processes.
4. Develop better protocols for handling water breaks and other complications when tank levels are low.

5. Bring the pre-treatment plant online, which includes operations and maintenance planning, training, and purchasing the necessary supplies and equipment.
6. Design and construct a new raw river water line to the cemetery, with capacity for possible future expansion.
7. Update the water treatment SCADA system, which gathers and analyzes data to ensure processes are working correctly and issues are resolved.
8. Replace the ductile iron water main which runs from the water treatment plant to Rawlins.
9. Evaluate and repair/replace the tanks in our tank farm.
10. Review and amend applicable city ordinances pertaining to water use and restrictions.
11. Assess and prioritize any in-town infrastructure repairs which are needed.
12. Research potential funding and incentive programs for reduced water use in homes and businesses.
13. We have designated $737,980.05 in American Rescue Plan (ARPA) Funding and $812,019.95 from City Funds. We have allocated $1.3 million from the Impact Assistance funds from the Power Company of Wyoming Chokecherry Project and are likely to designate more in the future. We have also applied for five Community Development Block Grants (CDBG) totaling $3,750,000.00, multiple State Land and Investment Board (SLIB) Mineral Resource Grants (MRG) with the largest being $7,797,708.00, and will continue to research and apply for additional funding opportunities.

However, these projects will cost $15+ million dollars. Staff is researching potential no- or low-interest loans and assessing a rate increase. The water and sewer funds are both enterprise funds, which means that by law they must be self-sufficient and cannot receive traditional governmental funding, such as sales tax.

What notification methods did you use?
How can I sign up?

The City of Rawlins and C4 used many methods to communicate with the public. Two flyers were distributed and posted in area businesses. Our website, including a text and email alert to subscribers, was updated daily. All updates were posted to Facebook and shared with regional groups. Emails were sent to all Utility users who have provided us with their email addresses. We partnered with Bigfoot to bring updates to the listening public, including two in-depth live interviews during the event. We also maintained a call center with 24/7 access throughout the event.

We also were able to send out two iPaws/Reverse 911 alerts. However, the usefulness of these alerts is limited due to the sporadic nature of the cell towers in Wyoming. For some users, this may mean that they do not receive the alert even though their neighbors did. It can also cause the alert to repeat multiple times, including in the middle of the night.

To receive alerts about specific addresses in Carbon County via call, text, app, or email, please register for AlertSense. This technology works directly with subscribers to get you the information to help protect life and property immediately. To register and for more information, visit www.CarbonWY.MyFreeAlerts.com.

Need more info?

You can always reach out to City Staff, City Council, or our Community Relations staff at 307-328-4500 ext. 1022 or crelations@rawlins-wyoming.com to help find answers to questions. For links to all the resources in this document, visit www.rawlinswy.org/water or scan this QR Code to the right.

Our county pulled together to respond to the Rawlins/Sinclair Critical Water Event in March 2022. It took our community to pull through, including everyone from the biggest organizations to the individual who stopped using their water. **Thank you to everyone who did your part!** We attempted to list everyone below, if anyone is missed it is only because our community's response was so tremendous.

- Ace Hardware
- Albany County Emergency Management
- Albany County School District
- Alex Bakken
- Bar S Trucking
- Bigfoot 99
- Black Hills Energy
- Blackwater Septic Solutions
- Bomgaars
- Cactus Jacks & Peppermill Bar
- Cassandra Cotera
- Church of Jesus Christ of Latter-Day Saints Humanitarian Services and Local Volunteers
- Dan Schisel
- Dave and his crew from Cedar Street Subway
- Dave Throgmorton
- Department of Agriculture, especially our local inspector Mykel Murray
- Elizabeth Ridgeway
- F&S Trucking and Welding
- Ichiban Japanese Steakhouse
- Janet Garcia
- Jen Rothenberger
- Lenny Layman, Carbon County Emergency Manager
- Marcell Astle
- Mary Piche
- Mike Lujan of Michael's Big City Steakhouse
- Michelle Christopher
- Pepsi
- Posey Wagon Portable Toilet Services
- Rawlins Search & Rescue
- Rawlins-Carbon County Chamber of Commerce
- Red Cross
- Region 8 EPA
- RMI Construction Services
- Scott and Beverly Hannum
- Sheri Vickrey
- Shively Hardware
- Sinclair Wyoming Refining Company
- St. Thomas Episcopal Church
- Stepping Stones Youth Home
- Sunrise Engineering
- Trevor Green
- Union Pacific
- Walmart
- Williams Companies
- Willie Jefferson
- Wyoming Department of Corrections
- Wyoming Department of Transportation
- Wyoming DEQ
- Wyoming Highway Patrol
- Wyoming Office of Homeland Security
- Wyoming Public Health Laboratory
- Wyoming Rural Water Association
- ZOCO Unlimited, Inc

  and
- Carbon County Staff, especially Commissioners, Attorney, Assessor, Buildings & Grounds, Clerk, District Court, Emergency Management, IT, Public Health, Road & Bridge, Treasurer, and Senior Services
- Town of Sinclair Council and Staff
- City of Rawlins Staff, including City Council, Community Development, Finance, Fire, Parks & Recreation, Police, Public Works, and Rawlins DDA/Main Street