

DON'T BE LEFT OUT IN THE COLD WITHOUT WATER



This photo was taken at the city of Republic in February 2021 by KRWA Technical Assistant Greg Metz. Due to freezing, the riser pipe busted under the bowl of the tank.

Spring and summer are finally upon us! The weather has finally warmed. It is hard to believe that we were all trying to stay warm from the sub-zero temperatures that were both miserable and dangerous just a short time ago. There was danger in terms of exposure to human health and water utility equipment. Granted, last February was extreme; many water system managers did not adequately prepare for the winter cold. For the waterworks professional, the potential life-threatening arctic temperatures that can impact during the winter months are not to be taken lightly.

Operator responsibilities . . .

Before the beginning of the cold season, by October or November, the waterworks professional manager/operator managing the public water supply system should be going over the different scenarios and considering the possibilities of what effects the freezing temperatures could have on water supply production and storage equipment. The manager/operator should inspect, service, and maintain key equipment to ensure the system remains reliable and viable during arctic events like that experienced in the central U.S. this past February.

Kansans have become accustomed to what have been mild winters. February 2021, however, was very different, with a prolonged snap of sub-zero temperatures that had penetrating consequences. Things that were never a problem before suddenly became a problem and there were many lessons learned that hopefully will not be soon forgotten. Many system managers and operators need to be better prepared in the future. There were storage tanks that froze, frozen service lines, frozen meters, frozen main lines, frozen tank control systems, frozen chlorination equipment, and many frozen fingers and toes of those out working on these issues.

At the beginning of each season, all heating equipment must be cleaned, lubricated, inspected and tested. Heat tape should be replaced periodically since it always fails when most needed. Heat lamp bulbs should be replaced each season. Tank recirculating systems should be operated and tested prior to the arrival of cold weather. Every system is different and has unique challenges, and it is impossible to cover all the different scenarios. Most of it ends up being just plain common sense. Sometimes things like changing the tank level or cycling sequences can help. Deep cycling is an option by simply changing the elevated storage tank set points so that the tank level drops significantly, resupplying the tank with warmer water. Shutting pumps down manually is an option if there are not automated controls. Surface water systems have a higher level of challenge because incoming water is already cold.

I know of a rural water district that frequently experienced icing problems during the winter, especially when cold weather persisted. Whenever their largest users shut down, such as during the holidays, the reduction in the daily usage resulted in excess tank water that continued to freeze thicker and thicker. We corrected this by setting up a recirculating system between cold elevated tank water to the warmer ground storage tank water. The temperature is monitored and the recirculating rate is adjusted to keep the temperature of the elevated tank above freezing.

Dealing with weather extremes for water systems

Several elevated storage tanks have experienced severe icing problems, one completely froze, two froze and split, and two had frozen control lines and transducers causing the control systems to fail and the tanks to either overflow or drain. Some tank control systems use a small quarter inch water line to transmit pressure to a transducer. Those must be heated or the transducer will not recognize the tank pressure. Some pressure control lines use mineral oil, which is generally better, since the oil doesn't freeze. But sometimes, the oil leaks out and is displaced by water. If so, there will be problems if the line freezes. These types of lines should be checked annually and recharged with mineral oil as needed.

Another phenomenon that happens, primarily on rural water district standpipes, is that capacity will be reduced as the capacity of the tank is reduced due to ice inside the wall of the tank. This will eventually freeze solid if corrective measures aren't taken. Deep cycling or flushing to replace the icy water with fresh and warmer water is the best solution to prevent this from occurring. I received a call from one system this past winter with pressure and pump short cycling issues. When the tank volume is reduced due to ice buildup on the interior walls of the tank pump run time will decrease and pump cycles will increase. If correct measures are initiated as soon as the cold weather arrives, this problem typically can be avoided. In severe

cases heavy icing problems can also lead to structural problems and coating damage. A little forethought about these types of issues can go a long way in preventing potentially catastrophic problems.

If a tank has to be taken offline for any reason during severe cold, it should always be completely drained or an entire freeze-up can result. With some of the control systems, tanks can even be taken offline for extended times and drained during prolonged freeze conditions while pressure is easily maintained with a VFD controlled pumping system. Although this works great, storage capacity is lost, precautions need to be taken to ensure meeting the required minimum pressure of 20 psi.

I saw an entire gas chlorination booster pump system that froze due to a failed heater damaging the pump and all of the PVC piping system. It was necessary to rebuild the system, including a new pump.

In one town I assisted, the water operator called about customers being out of water. A quick test on the city side of the meter revealed a problem from the main line to the meter. This meant one of two things. Either the main line is scaled over from mineral deposits or some other type of obstruction at the service tap – or the service line is frozen. Either way, extensive measures were required to restore the customers' service. The service line was frozen and had to be rebuilt. The frozen copper service was part of the original system installed in 1913. In those days, the cast-iron mains were tapped and directly threaded right from the top of the main. Therefore, by the time the ¾-inch copper line was carefully and gradually bent 90 degrees it was only 18 inches deep under the pavement, which is inadequate. Service lines should be at least 30 inches and preferably 36

inches. We corrected this problem by re-tapping the main at a 30-degree angle and constructing a new service line.

Other KRWA staff assisted many water and wastewater utilities during the extreme cold. The only change in KRWA's work was the temperature. The technical assistance provided by KRWA is "boots on the ground" – and that goes on year-round. If KRWA can be of help in any way, I encourage you to contact KRWA at 785.336.3760 or email to krwa@krwa.net or contact a staff member directly.

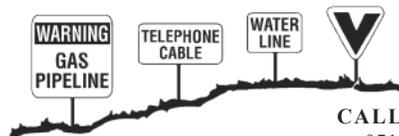
Jon Steele has been employed by KRWA as a Circuit Rider since 1995. Jon is certified as a water and wastewater operator. He has more than twenty-five years experience in public works, construction and industrial arts.



KRWA staff assisted many water and wastewater utilities during the extreme cold. The only change in KRWA's work was the temperature.

Rural Water Specialty Co.

Signs and Markers
for the Utility & Pipeline Industry



CALL 918-446-1916
9710 W. 65th St. So.
Sapulpa, OK 74066-8852
Fax: 918-446-2770

Kaylynn Vogts Awarded State Water Association Scholarship

The Kansas Rural Water Association has announced that Kaylynn Vogts is the recipient of a \$1,000 academic scholarship from the Association.

Kaylynn is the daughter of Travis Vogts, who is the Maintenance Supervisor and certified water and wastewater operator for the City of Waverly, and Kristi Vogts.

Kaylynn has maintained a 4.0 grade point average throughout her high school career and has taken it upon herself to take dual credit classes maintaining a 4.0 grade point average in those as well. She has been involved in a variety of school activities and has served in several leadership rolls including Class President, Student Council President, National Honor Society (NHS) President, Future Business Leaders of America (FBLA) Secretary and Fellowship of Christian Athletes (FCA) President. She has also participated in volleyball, basketball, track and



band. Kaylynn has also been a member of Tip Top 4-H Club, where she has served as the club treasurer for four years, county council representative for five years and county 4-H council treasurer for three years. During 2020, Kaylynn was selected to participate in the eleventh annual K-State Animal Sciences Leadership Academy (KASLA) in Manhattan.

Kaylynn plans to attend Kansas State University to pursue a Bachelor of Science degree in Animal Science to pursue a career in either Veterinary Medicine, or specialize in the area of Veterinary Technician.

The annual scholarship award is presented to the dependent of an employee of a KRWA member water or wastewater utility or of a KRWA employee. The scholarship was established in the name of Dennis Schwartz, long-service member of the KRWA board and leader in national water utility organizations.

KANSAS RURAL WATER

association

ABOUT
ONLINE RESOURCES
TECHNICAL ASSISTANCE
TRAINING
CONFERENCE
MEMBERSHIP

TRAINING > schedule & register

Today July 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
27	28	29	30	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

- Administrative / Management
- Board / Council
- Cross Connect / Backflow Prevention
- Drinking Water Regulations
- Electrical
- Safety
- Water System Operations
- Wastewater Utility Operations

KRWA's Mission No. 1 is TRAINING

for water and wastewater systems! If you have an interest in a training topic, send an email to krwa@krwa.net or call KRWA at 765-336-3760.

NOTE -- This schedule shows the training sessions presently planned by KRWA. Additional sessions will be posted as they are developed. Please note that for VIRTUAL (Online) TRAINING, click on the link in the brochure. DO NOT "ADD TO CART". ONLINE TRAINING IS HANDLED THROUGH GO TO WEBINAR PORTAL. AS OF NOVEMBER 10, KRWA IS REQUIRING MASKS BE WORN BY ALL THOSE ATTENDING IN-PERSON TRAINING. BRING YOUR OWN, OR KRWA WILL ALSO PROVIDE AT EACH SESSION.

Search for training by entering a word in topic or city (location) name.

July 13 - 16, 2021	Cross Connection - Backflow Prevention (full certification)	Topeka (Garfield Community Building)	\$225.00	w	This session is filled.
July 13 - 14, 2021	Cross Connection - Backflow Prevention (information only)	Topeka (Garfield Community Building)	No Charge	w	This session is filled.
July 15 - 16, 2021	Cross Connection - Backflow Prevention (recertification)	Topeka (Garfield Community Building)	\$150.00	w	This session is filled.
July 15 - 16, 2021	Cross Connection - Backflow Prevention (recertification)	Topeka (Garfield Community Building)	\$150.00	w	<input type="button" value="Add to Cart"/>
July 20, 2021	Chemical Feed Pumps & What They Deliver	Online Training	No Charge	w & ww	view details
July 21, 2021	Competent Person for Trenching and Excavation (Beloit)	Beloit	\$90.00	w & ww	<input type="button" value="Add to Cart"/>

KRWA is providing both in-person and VIRTUAL TRAINING.

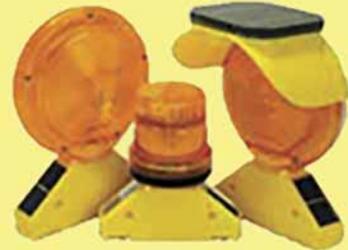
www.krwa.net

BARCO Municipal Products, Inc.

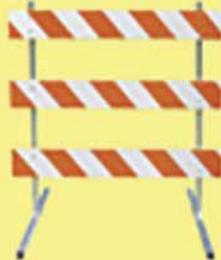
CITY OF CHUGWATER
WASTEWATER
TREATMENT FACILITY
NO TRESPASSING

**WATER
LINE**

**WATER
VALVE**



SCHONSTEDT
INSTRUMENT COMPANY



WWW.BARCO1.COM