



## Cold Season Issues and Solutions

Cold weather can create massive and expensive issues. It can affect everything from common households to city or rural water systems.

Temperatures in the -30 range and accompanied by wind take an extreme toll on vehicles, equipment and infrastructure.

Dealing with extreme cold makes it difficult to keep everything “flowing with minimal issues.” Certain precautionary measures can be taken to help ease the hassle and minimize issues.

Most individuals don’t think about where their water comes from or what the temperature may be. For example, if a meter is under a trailer house, it may be wrapped with insulation. If the water isn’t moving periodically, it can still freeze. This can also apply to houses with unfinished basements where there may be a small draft. Meters in the basement may get cold enough to freeze the line.

In certain circumstances, there is a small failsafe installed to try and keep damages to a minimum. For example, pex piping has a small margin for expansion under the damaging pressure caused by ice formation. Materials like copper and PVC provide almost zero tolerance to freezing expansion. Another example is the backing plate on a water meter that is designed to crack or break if it freezes, allowing little to no damage to the brass housing.

Another way to prepare and address cold weather and keep lines from freezing is to allow water to trickle from the kitchen sink. This trickle allows the water to have continuous motion, moving warmer water through the colder zones and keeping the ice from forming in the lines.

In these colder temperatures, frost can penetrate 4 to 10 feet into the ground. Water lines are usually buried deep enough to keep them from the frost zone. Lengthy deep freezes and the amount of snow cover determines the frost depth. In more extreme climates, the bury depths for service lines may not be deep enough to keep them from freezing. If this were to happen, there are ways to thaw the line using recirculating hot water from small lines that are inserted into the service line where the house meter is installed.



*Tower complications due to cold temperatures.*

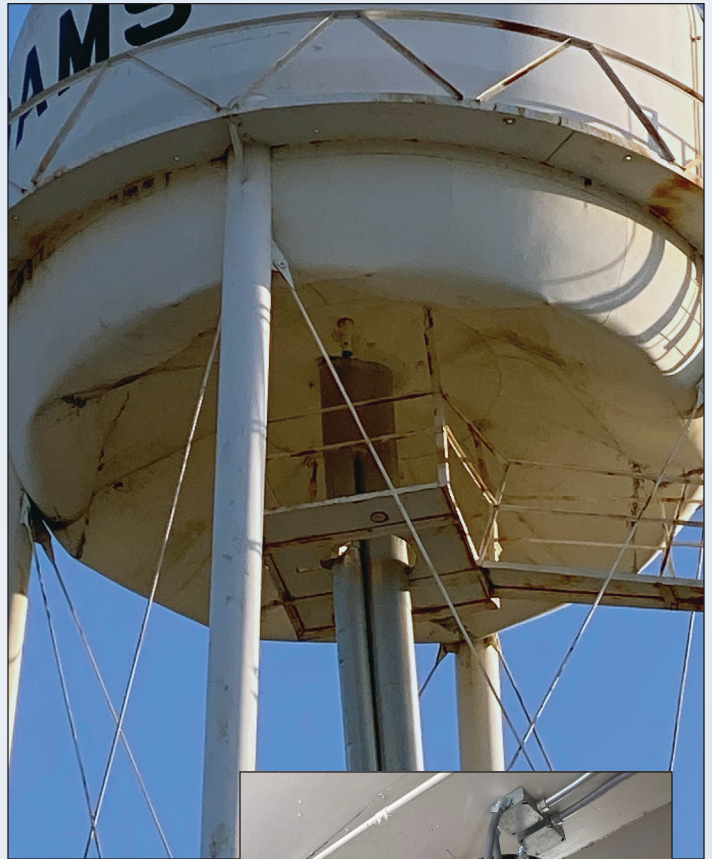


A city's water infrastructure involves a bit more preparation. If a problem exists in a household and they are unable to stop the flow of water from the burst line, the city responds in an emergency manner, obtaining documentation of its location, removing the snow, and getting the water shut down. This can become a huge problem if the information is incorrect.

Another concern is above-ground water supply storage. This can be either a ground storage tank or a water tower. Even though there is water flowing in and out of these tanks, ice will still form on the sides where there is less movement. Depending on the size of the town and how much water it uses throughout the day, monitoring the tank levels and pressures daily is a good idea. If larger amounts are used, the turnover in the tower is large and there should be little to no worry or issues with the ice building up. For municipalities that use smaller amounts of water in the winter, it is a good habit to lower the level of the water tower to keep the turnover of the water higher.

The longer water sits in the tower, the more potential for freezing. It also can freeze creating what is called "capping over." This causes a vacuum in the tower and makes the pressures in the tower rise and fall dramatically in short periods of time.

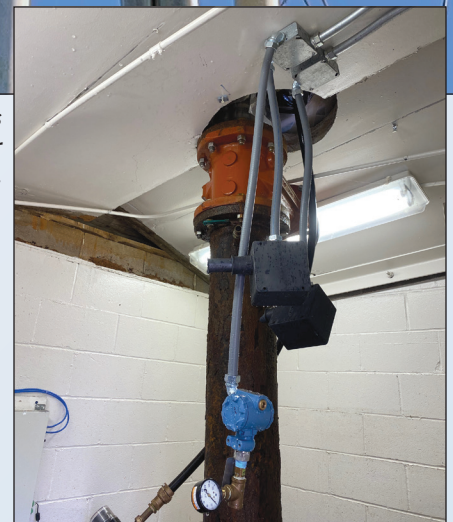
Another area of concern is the riser pipe which leads to the tower bowl. If there is not enough water movement through the riser pipe, there is a chance it will freeze



*Frigid temps causing tower damage.*



*Ice build-up in tower.*



causing no pressure in town and high-pressure spikes. Frigid temperatures could cause the standpipe to crack and break.

Finally, another thing to address is fire hydrants. Proper yearly flushing and servicing keep most issues to a minimum and the hydrant in peak performance. Entering fall, it is a good practice to check hydrants to make sure they operate with ease and seal properly. If the drain back in the hydrant doesn't work properly, the hydrant will have to be pumped empty. Not doing so will cause the hydrant barrel to freeze and burst. If the hydrant is introduced to extreme heat such as a forced fuel heater or a propane weed burner, that can cause an extreme expansion of the water inside causing the hydrant to burst. Steaming from the top caps seems to work quite well while keeping damages to a minimum.