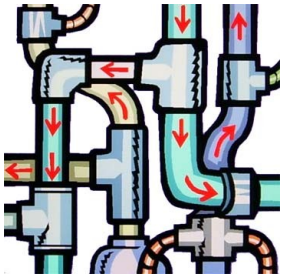
Backpressure

Just like everything else plumbing gets more complex with each passing day. Backpressure is often the result of us as consumers connection equipment to the water system. Chemical feed equipment used in manufacturing, boilers used to heat homes and buildings, swimming pools equipped with pumps, even parts cleaning equipment found in repair shops along with many others types of equipment pose potential Backpressure situations for the water system.



Backpressure is defined as a pressure, higher then that of the supply pressure. This can be caused by a pump, elevated tank, boiler, air or steam pressure, or any other means which may cause backflow.

Unlike backsiphonage, backpressure can occur even when the pressure in the water main is normal. Back pressure is often a result of a mechanical malfunction or human error. Lets say that a worker at our local widget factory forgets to close the water inlet valve before he turns on the pump for a piece of equipment that mixes chemicals. If the pump generates more pressure than the pressure in the water main, a backflow will occur as a result of the backpressure.

Federal, State, and Local Regulations require that the water department monitors its consumers and the equipment used throughout the system for potential cross connections. This is done by both physical inspections of plumbing and by surveys that are sent to each residential, business, and industrial customer of the water system. The survey is conducted every 5 years.

Depending on the type of situations found a verity of devices are available to protect you and the water system from backflow. For your safety the City of McCook regulates plumbing through the Office of the Building Inspector and the Water Department.

Common Backflow Devices

Hose Connection Vacuum Breakers permit attachment of portable hoses to hose thread faucets. The device prevents the flow of contaminated water back in to the potable water supply. These require no plumbing changes, and screw directly onto a sill cock. Applications include service sinks, swimming pools, wash racks, and general outside gardening.

Dual Check Valves are designed for non-health hazard residential water system containment and continuous pressure applications, such as drinking water supply service entrance or individual outlets.

Atmospheric Vacuum Breakers (AVB) are used to protect against backsiphonage. The device must be installed on the discharge side of the last shutoff valve and a minimum of 6" above the highest over flow level. Common applications include chemical vats, laboratory sinks, and lawn sprinkler systems

Pressure Vacuum Breakers (PVB) protect against health and non-health hazard backsiphonage conditions in industrial plants, cooling towers, laboratories, laundries, swimming pools, and lawn sprinkler systems. These devices are rated for continuous pressure applications where water enters equipment at or below the flood rim. Unlike an AVB the PVB can be installed on the inlet or pressure side of a valve but must be 12 inches above any down stream piping. Most applications of this type of device requires annual testing by a Grade VI Certified Water Operator.

Reduced-Pressure Principle Backflow Assembly (RPBA) consists of two independent acting check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves. These devices are approved to protect against both backpressure and backsiphonage and are installed in locations of known health hazards. The RPBA are often used at chemical plants, medical facilities, Metal manufacturing / fabricating, and other facilities where high hazards exist and an air gap is not feasible. Most applications of this type of device requires annual testing by a Grade VI Certified Water Operator.

Cross Connection and Backflow Information

McCook Water Treatment Equipment

City of McCook,
Water Department
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308-345-1461 (fax)

Dennis Berry, Mayor
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AN INTRODUCTION TO McCook's Water Utility

The McCook Public Water System receives its water from a series of wells located in the Republican River Valley. Prior to distribution water from the wells is softened and treated to remove Nitrate, Arsenic and Uranium. The treatment plant completed in February of 2006 has a capacity of 6.5 million gallons per day and uses Ion exchange to remove impurities from the water.

McCook 's West Water Tower one of 3 water storage facilities that serve the city. Total combined water storage is 6 million gallons

Water from the plant is distributed to the 7,994 residents by 3,500 service connection supplied by 2 pumping stations and 53 miles of water main ranging in size form 24 inch to 3 inch. Daily production for 2010 averaged 1,832,523 gallons with a peak day of 4,249,000 (9-4-10) and annual production of 668,861,000 gallons.

The water system employees 5 licensed water operators, a billing clerk, and is governed by the City Council under the management of the City Manager and Utility Director. The budgeted revenue for fiscal year 2010-2011 is 1.8 million dollars.

The City of McCook is licensed by the State of Nebraska Department of Health and Human Services to operate a Class III Public Water System Permit No. NE3114504. The system is regulated by Title 179 Regulations Governing Public Water Systems in the State of Nebraska.

Cross Connection & Backflow Program

The Safe Drinking Water Act (SDWA) was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells.

Guided by the SDWA the State of Nebraska Department of Health & Human Services sets forth regulations that all community water systems within the state must follow. One of these requirements is to conduct an on-going public information program. The purpose of the program shall be to better the understanding and awareness of **cross-connection** hazards, the types of remedies available, and the need to protect the public water supply against backflow.

What is a Cross-Connection?

There is a long detailed explanation of what a cross connection is, but in plain language. **A direct or indirect connection between your drinking water and another source of water that is not safe to drink.** A cross connection can result in a **backflow** of this unsafe water into your drinking water.

What is a backflow?

Backflow is when water flows in the opposite direction of its intended flow. For example, water is intended to flow from the city water main through your water meter to your house. Backflow is when water flows back from your house to the city water main. This can occur when pressure in the main becomes low due to a break in the water main. Normally this would not be a problem, after all the water in your house came from the city and it was safe when it went into your house. But lets say you are washing your car and have the garden house running down in a bucket of soapy water along with the sponge that has just scrubbed two weeks of grime off your car. The pressure drops setting up a backflow. When a backflow occurs a **backsiphonage** can result.

Now just what is Backsiphonage?

That is when negative or reduced pressure in the water system or plumbing of your home causes potentially unsafe water to be drawn in to the piping.

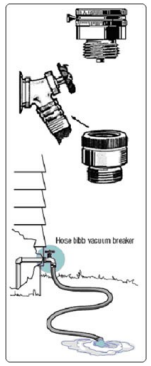
Remember that garden hose in the bucket of soapy, muddy water, as pressure decreases in the water system that water can be "siphoned" or drawn back into your home from the bucket. That's a backsiphonage.

How do I keep this backsiphonage from happening?

It is fairly easy to keep backsiphonages from happening by always maintaining an **air gap** between the end of the hose and the rim of the container that is being used. Containers can be anything from a drinking glass or bucket to a swimming pool or a tank.

Air gap, what is that?

Air gap is the open space or vertical distance through the free atmosphere, between the end of the discharging pipe, hose or faucet and the top or flood rim of the receptor/ container. An easy rule of thumb is never less than 1 inch of air gap.



There are also devices called hose bid vacuum breakers that can be installed on your hose bib that will add protection. Hose bib vacuum breakers are fairly inexpensive, less than $10 at the hardware store. These devices consist of a spring-loaded check valve that seals against an atmospheric outlet when the water supply is turned on. When the supply is turned off, the device vents to atmosphere, thus protecting against backsiphonage conditions.