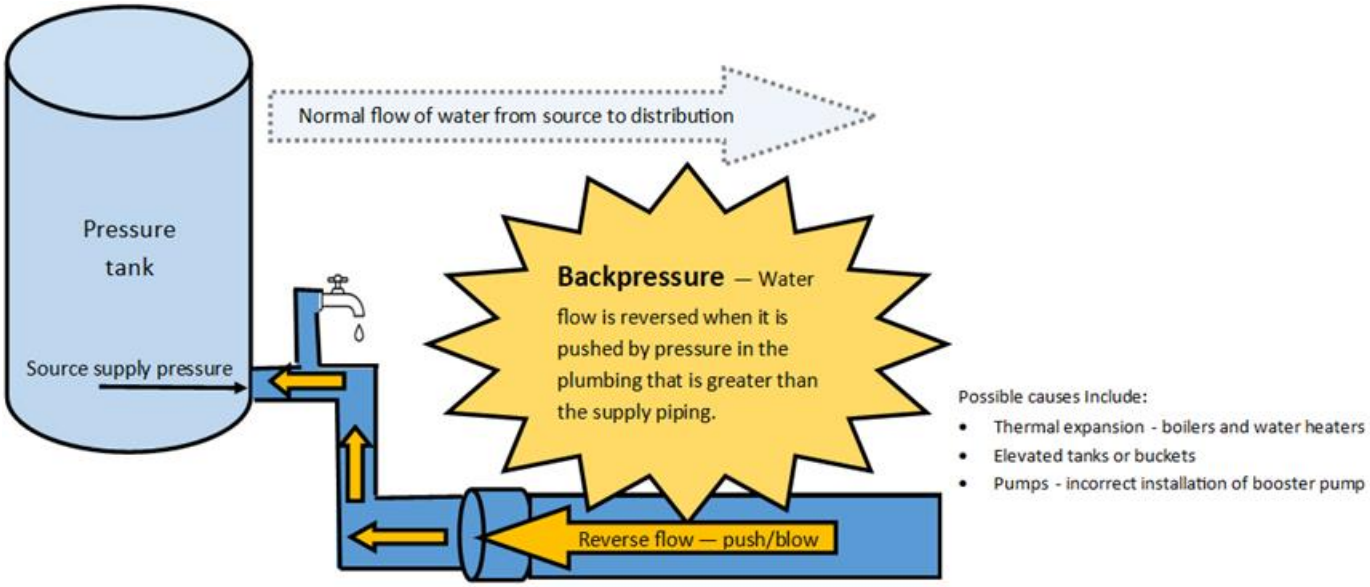
Common cross connections:

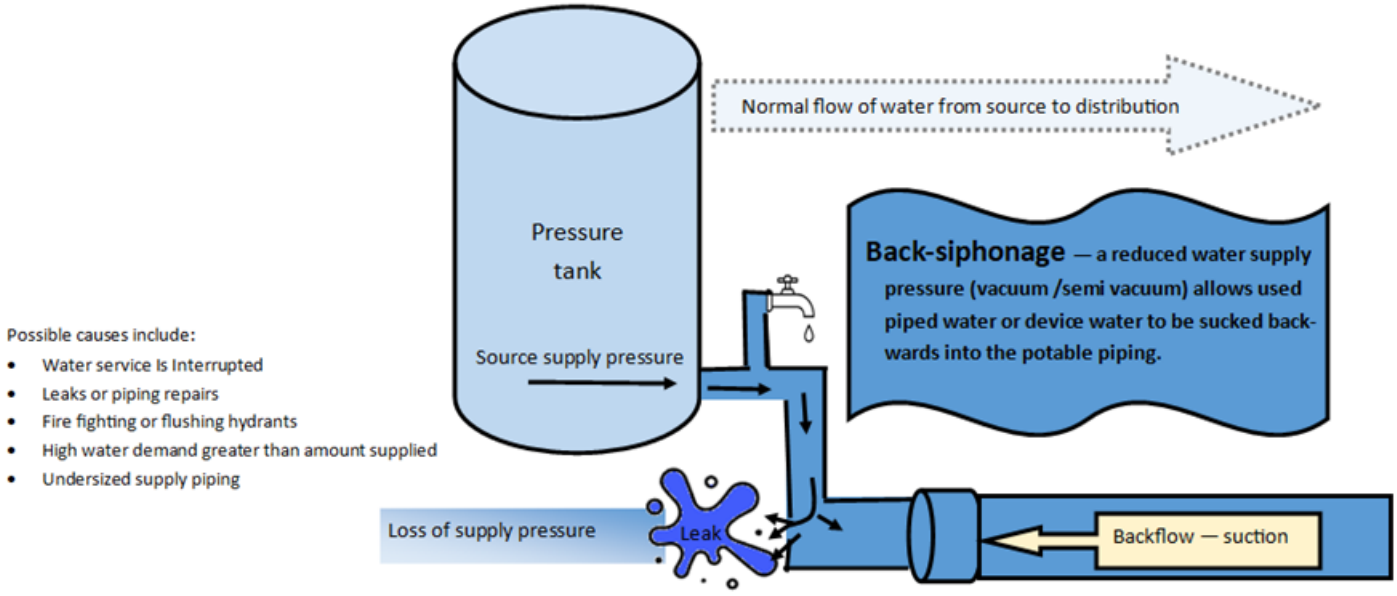
Water System Cross Connection Control Options

A cross connection is a physical connection between a possible source of contamination and the public drinking water system piping. This connection, if not properly protected, can allow contaminants into the drinking water system. Contamination can occur due to backflow.

WHAT IS BACKFLOW?

Backflow is the unwanted reverse flow (upstream) of water or substances into the distribution piping of a potable water supply. Backflow – is caused by back-pressure (blow/push forces) and back-siphonage (suction).





All backflow prevention devices protect against back-siphonage. However, air gaps and some mechanical devices are not acceptable for the protection against back-pressure.

IRRIGATION BACKFLOW OPTIONS

Atmospheric Vacuum Breaker - ASSE 1001

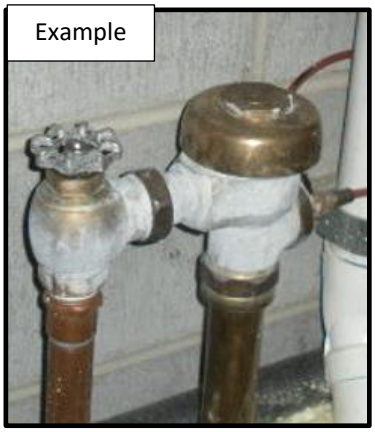
Back-siphonage

1. Provides protection against low hazard or high hazard contaminants
2. Device cannot be installed where it is under continuous pressure from the water supply (Limiting pressurized use to 12-hours or less decreases sediment build-up that could cause valve failure)
3. Assembly must be accessible for field inspection and maintenance
4. Must be installed in a vertical position on each zone
5. AVB side must be downstream of the sprinkler control side of the unit
6. Must be installed <u>at least six inches</u> (check local codes) above all downstream piping and outlets

Pipe Applied Atmospheric Type Vacuum Breakers Atmospheric Vacuum Breaker - ASSE 1001 single pipe applied

Back-siphonage

Example



Combination Atmospheric Vacuum Breaker and Sprinkler Valve - ASSE 1001

Example

Pressure Vacuum Breaker Assembly - ASSE 1020

High Hazard

Back-siphonage

1. Must be installed at least <u>twelve inches above flood rim</u> (ground level/surrounding grade or basin) and <u>downstream piping</u>
2. Requires annual testing
3. Requires State of WI registration
4. Installed outside only
5. No back pressure allowed
6. May be installed under constant pressure upstream of the control valves
7. Device must be installed in a vertical position
8. Has a check valve that allows water through when the air inlet is closed. When the water pressure drops lower than air pressure the vent opens and breaks suction to prevent backflow of water

Example

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REDUCED PRESSURE ZONE BACKFLOW PREVENTER (RPZ) - ASSE 1013, or AWWA C511

High Hazard | Backpressure | Back-siphonage

1. **Air gap or a reduced pressure zone backflow prevention assembly complying with ASSE 1013 or AWWA**
2. **Install above grade**
3. **May be used under constant pressure**
4. **Acceptable for low hazard and high hazard installations**
5. **All RPZ valves require annual testing**

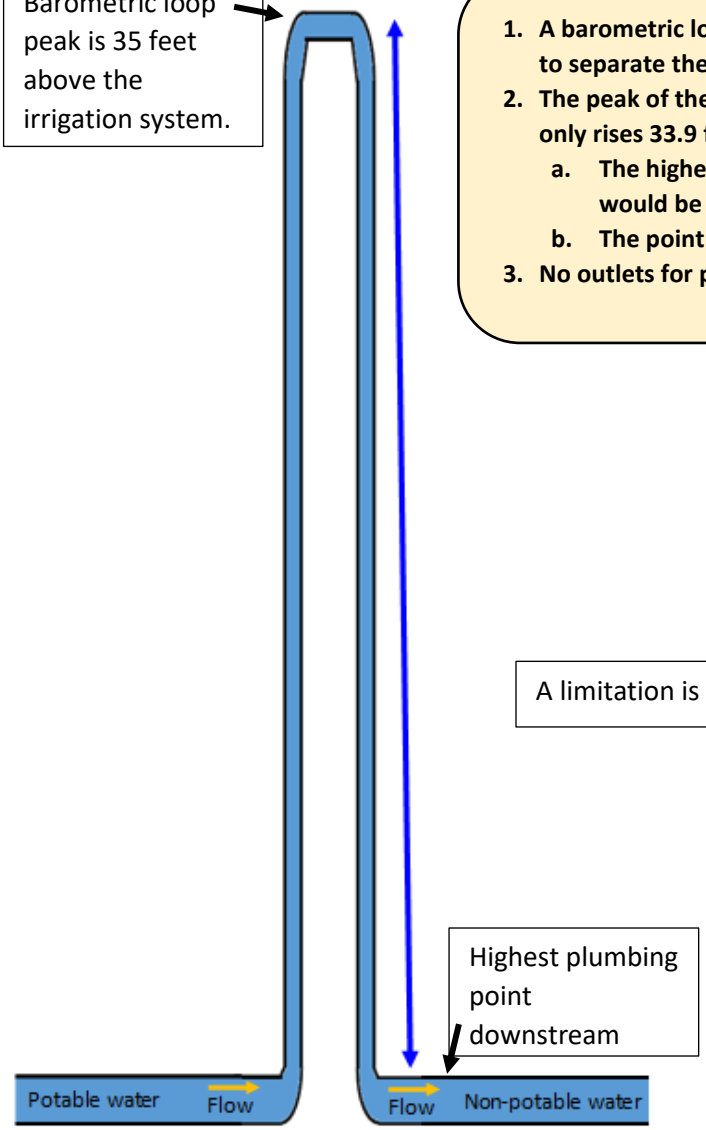
Example

Barometric Loops - SPS 382.41(5)(i)

Back-siphonage

Barometric loop peak is 35 feet above the irrigation system.

1. **A barometric loop is a loop in the supply piping of a potable water supply to separate the supply piping from a cross connection source**
2. **The peak of the loop shall extend at least <u>thirty-five feet</u> above (water only rises 33.9 feet in a column under average air pressure):**
   a. **The highest point downstream from the loop where backpressure would be created; and**
   b. **The point of discharge**
3. **No outlets for potable water use shall be installed downstream**



A limitation is it requires a large amount of space for installation.

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Transient Non-Community Public Drinking Water

These sheets do not include all available cross connection options. For a Wisconsin Department of Safety and Professional Services listing of current accepted cross connection control methods, devices and assemblies for specific applications go to:
https://docs.legis.wisconsin.gov/code/admin_code/sps/safety_and_buildings_and_environment/380_387/384.pdf

For additional information on plumbing backflow protection contact the Department of Safety and Professional Services consultant Email: DspsSbPlbgTech@wi.gov