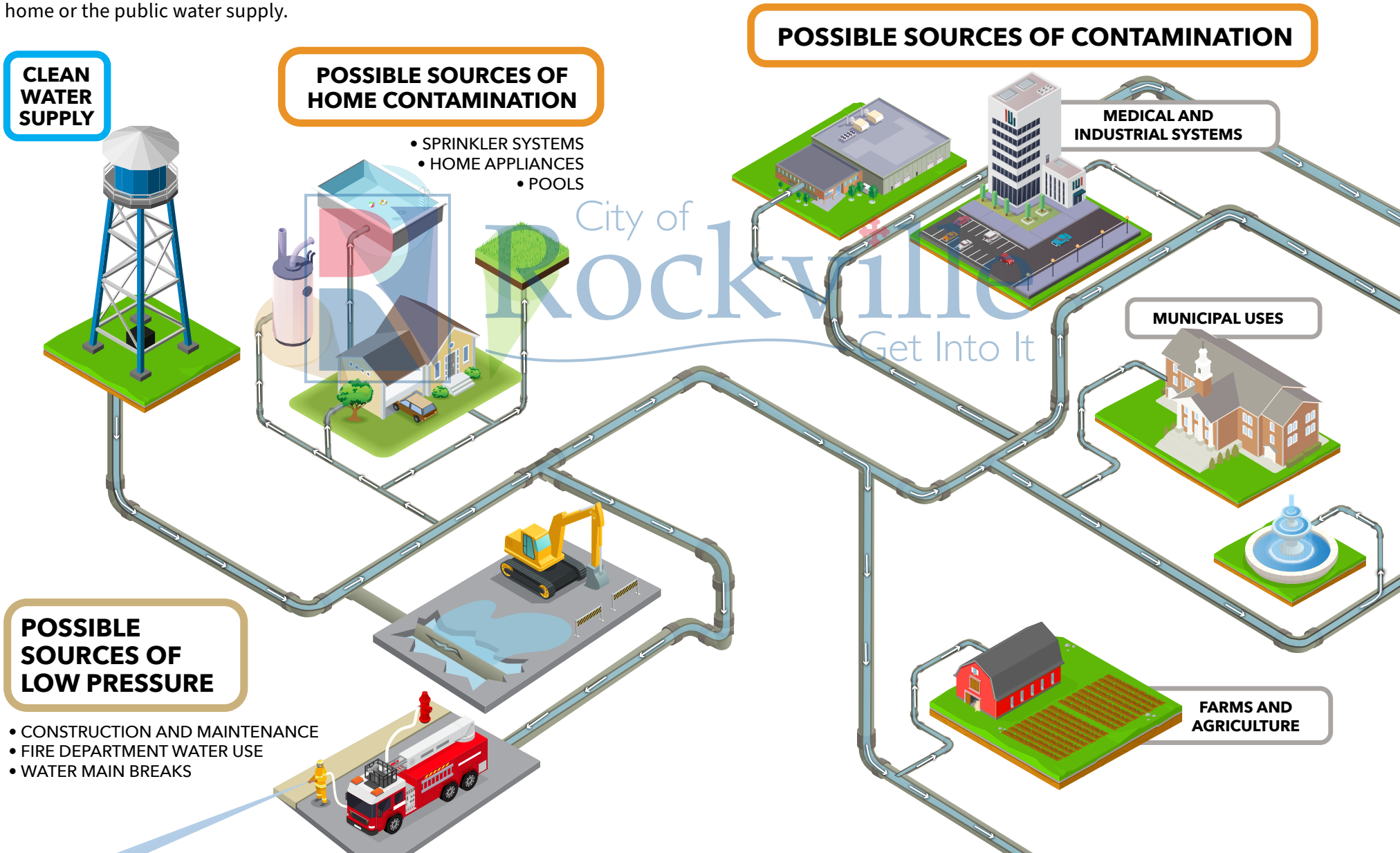
WATER SHOULD FLOW ONLY ONE WAY

PREVENTING BACKFLOW AT HOME

WHAT IS BACKFLOW?

To ensure that clean, safe drinking water reaches your faucet, hose, shower, and appliances, water should flow in only one direction from the public water supply to your home. Backflow is the flow of water in the opposite direction from the one in which it's intended to flow. If the water pressure in the main supply line drops below the pressure in the household plumbing system, water can flow back into the household water supply or the main supply line and potentially contaminate your home or the public water supply.

Contaminated water can pose serious health risks. Thankfully, backflow-prevention devices, properly installed and maintained, protect our water system. Water agencies typically conduct cross-connection surveys or inspections to determine the level of backflow protection necessary at different properties. It's important to spend the time to understand what type of backflow protection your property needs.



CROSS-CONNECTIONS

In water systems, "cross-connection" refers to any physical link between a potable (drinkable) water supply and a source of contamination or pollution, such as impotable water, chemicals, or other harmful substances. Cross-connections could take the form of pipes or appliances installed without proper backflow-prevention strategies or hoses, irrigation, or faucets being submerged in water or chemicals. A cross-connection is a link through which contaminants can enter water supplies when backflow occurs.

Water systems have cross-connection control programs to evaluate the risk of cross-connections and require backflow-prevention measures to ward off contamination. But you play an important role too! As you install new pipes, appliances, or other connections, consider the risk of cross-connections and make sure that backflow prevention is properly installed where it's needed.

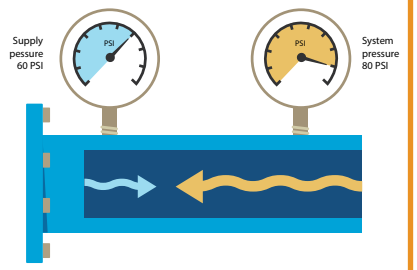
HOW TO TELL IF YOU HAVE A BACKFLOW ISSUE

Backflow can occur without your noticing the problem, so you should ensure that you have properly installed and inspected backflow preventers at all times. Many common water quality complaints could be signs of backflow. But they could also be signs of leaks or plumbing issues. If you notice any of the following, call your plumber and water utility immediately:

- **Discolored or contaminated water**
- **A sudden drop in water pressure**
- **Water that smells or tastes strange**
- **The water meter running backward**

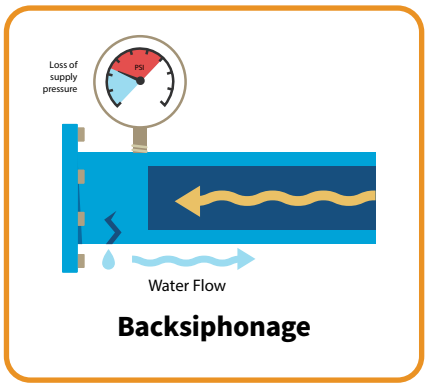
TYPES OF BACKFLOW

There are two main types of backflow: backpressure and backsiphonage. Both can pose a serious threat to the public drinking water supply and are averted by the installation of backflow-prevention devices.



Backpressure

Sometimes backflow can be caused by an appliance, such as a water heater, pushing water back into the house at a higher pressure than that of the water supply in the house. This is called "backpressure backflow," and it occurs when the pressure in the pipes supplying water to a building becomes higher than the pressure in the main water supply. The source of backpressure backflow can be a pump, boiler, or other pressure-increasing equipment connected to the plumbing system. Most appliances connected to the home water system have built in backflow prevention devices. If you suspect that one does not, discuss the issue with a licensed plumber and have a backflow prevention device installed.



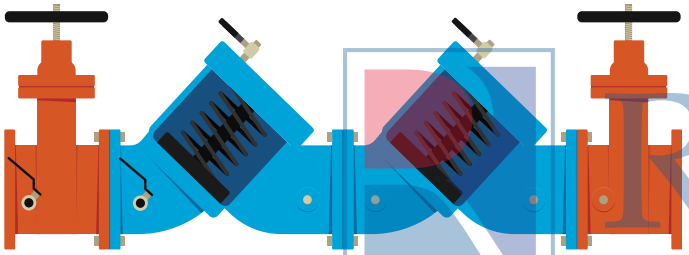
Backsiphonage

Water pressure can drop for any number of reasons: a water main break, firefighters drawing water to fight a fire, abnormally high water usage, etc. When it happens and there's no backflow-preventing device, water could backflow. This is called "backsiphonage backflow." The pressure drop creates a vacuum that can draw contaminated water from a building's plumbing system back into the main water supply, potentially contaminating the drinking water of an entire community. To prevent backsiphonage backflow, backflow-prevention devices must be installed.

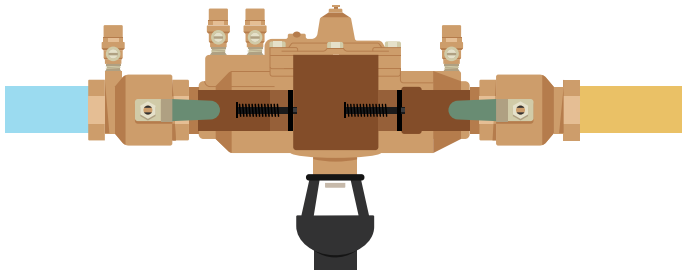
TYPES OF BACKFLOW PREVENTERS

Several types of backflow-prevention devices exist. Which device to install will depend on the specific characteristics of the household plumbing system and the potential risks of backflow. The type of device may be prescribed by regulation, and it's important to ensure that you are installing the correct backflow preventor for your situation. Homeowners should consult with a licensed plumber or engineer to identify the most suitable device for your needs:

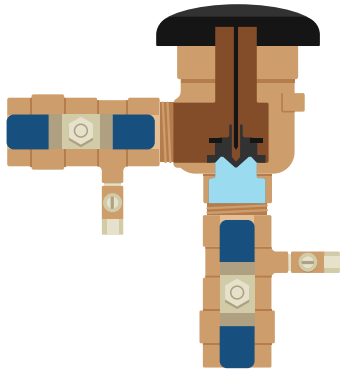
- **Double-check valve assembly (DCVA):** This device consists of two check valves connected in series. It prevents backflow by allowing water to flow in only one direction.



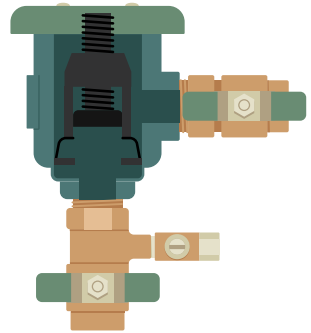
- **Reduced-pressure principle backflow assembly (RP):** Also known as reduced pressure zone assembly (RPZ), this device consists of two check valves and a hydraulically operating differential valve. If there is a difference in water pressure, the relief valve opens and discharges water to prevent backflow.



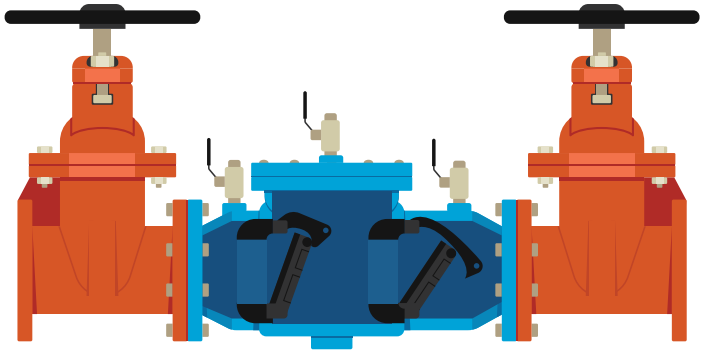
- **Pressure vacuum breaker (PVB):** This device consists of a spring-loaded check valve and an atmospheric vent. It prevents backflow by allowing air to enter the system when the water pressure drops.



- **Spill-resistant vacuum breaker (SRVB):** This device is similar to a pressure vacuum breaker, but it has an additional check valve that prevents water from spilling out of the device if the spring-loaded check valve fails.



- **Dual check valve (DCV):** This device consists of two independent check valves that are connected in parallel. It prevents backflow by allowing water to flow in only one direction.



IN THE YARD

Yard work is a common source of backflow issues. The most important rule is that there should always be an air gap between a hose and any water source. Never immerse a hose in water, including water in buckets, ponds, swimming pools, and pet bowls. Doing so creates the potential for chemicals and contaminants to be drawn back into the water system.

In addition to ensuring that there's always an air gap, homeowners should take other steps to prevent backflow from a garden hose:

- **Use a hose bibb vacuum breaker.** This inexpensive and easy to install device is designed to prevent backflow from hoses. It should be installed at the point where the garden hose is connected to the household plumbing system. In many jurisdictions, this is required.

- **If you don't have a bibb vacuum breaker, use a hose with a built-in backflow-prevention device.** Some garden hoses are equipped with a built-in backflow-prevention device, such as a check valve.

- **Disconnect the garden hose from the household plumbing system when it's not in use.** Backflow from a hose can't occur if the hose isn't connected.

- **Avoid using a garden hose when the water pressure is low.** If the water pressure in the main supply line is low, backflow is more likely.

- **Ensure that you're using a backflow preventer before connecting your hose to any device or piece of equipment.** Especially one that uses chemicals, such as a garden sprayer.

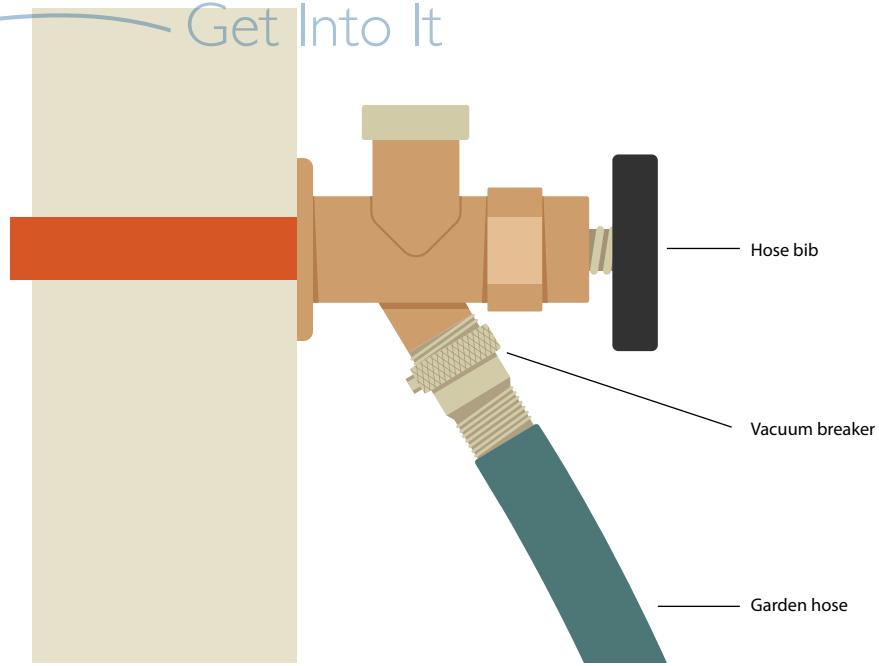
Lawn irrigation systems are another potential source of backflow. They're of special concern if you're using pesticides or fertilizers on your lawn. There are a handful of steps you can take to protect your irrigation system from backflow:

- **Install a backflow-prevention device. Determine the right type of backflow protection based on your use, the climate, and local regulations.**

- **Avoid using the irrigation system when the water pressure is low.**

- **Disconnect the irrigation system from the household plumbing system when it's not in use.**

- **Regularly inspect and maintain the irrigation system to ensure that it's functioning properly.**



BACKFLOW AND PRIVATE WELLS

If you have a private well, additional backflow considerations come into play. Because private wells aren't connected to the public water supply, they're not tested and regulated in the same way as the municipal water system. If your well is going to be connected to your residential water system, check with your water utility about the requirements for backflow devices and water quality testing. If you, as a homeowner, decide to abandon a well because of the cost of maintaining both connections, you should contact your water department about how to do so safely.

In addition to avoiding a cross-connection, it's important to take steps to prevent your well water from becoming contaminated:

- **Regularly inspect and maintain the well to identify and fix problems before they become serious.**
- **Use a water filter to help remove contaminants from the water supply.**
- **Avoid spraying pesticides or chemicals near the well or on your property when rain has been forecast.**

COMMERCIAL AND INDUSTRIAL BACKFLOW PREVENTION

It's especially important that businesses use backflow-prevention devices to keep contaminants out of the water supply. The type of backflow preventer will be determined by the type of water use and chemicals present at a business. While commercial/industrial backflow prevention is a big topic, here are a few things to know:

Inspections: Businesses should ensure that their backflow-prevention devices are inspected and their water tested regularly (as mandated by local regulations). A paper tag will be attached to the backflow preventer with the date of the last inspection.

Moving: Before moving a business into new premises, get the backflow preventer tested. The commercial building inspector will usually note the presence or absence of a backflow preventer but won't test the device.

Hoses: A hose bibb (described earlier in this book) is an adequate level of protection for certain applications, but in commercial or industrial applications where hoses may come in contact with more dangerous chemicals, a more robust backflow-prevention strategy is warranted.

Evaluate existing practices: Best practices and codes change over time, as do the backflow-prevention requirements of a commercial or industrial use. From time to time, ensure that your business is doing everything it can to protect the public water supply by assessing whether it's following the best approach to backflow prevention for its industry and use.

Untestable backflow-prevention devices: Not all types of commercial and industrial backflow-prevention devices are testable. An example is single-check-valve backflow preventors in fire sprinkler systems. Untestable devices have a life span, and it's essential that they be tagged with their installation date and replaced before their expiration date. Depending on the use case, you may be required to upgrade to a testable system.

RESOURCES

Visit these sites for additional information:

AMERICAN BACKFLOW PREVENTION ASSOCIATION

https://www.abpa.org

EPA CROSS-CONNECTION CONTROL

A Best Practices Guide

https://www.epa.gov/sites/default/files/2015-09/documents/epa816f06035.pdf

City of Rockville
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