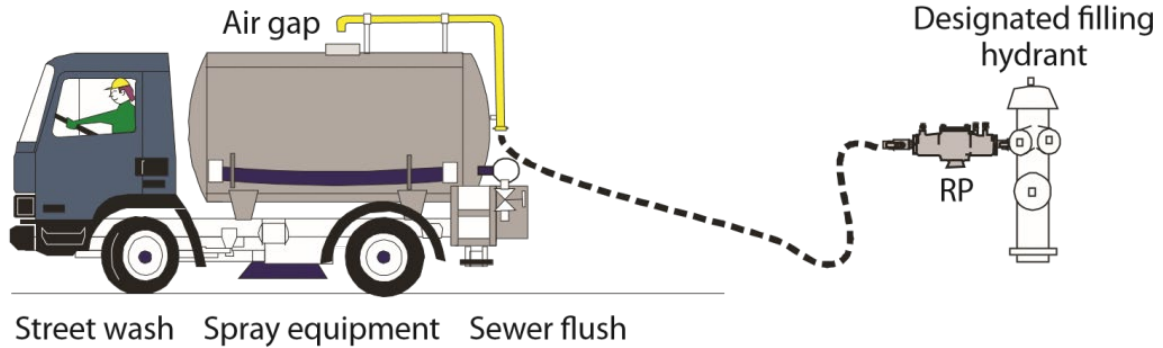


# Cross Connection Control Program

Permanent mounted air gapped fill pipe



## Jackman Utility District-Water Division

Approved by Trustees 6/23/03  
Updated 8/12/15  
Updated 4/26/17

## Summary

The Safe Drinking Water Act of 1974 is the backbone that drives all water suppliers, to not only make safe drinking water but to deliver it to customer without its quality being compromised as a result of its delivery through the distribution system. The Jackman Utility District (JUD) takes pride in the fact that our rate payers can rest easy knowing the water is safe when they turn the faucet on. The Jackman Utility Districts' Cross Connection Control Program is designed to prevent the contamination of drinking water by the backflow of water or other liquids, gases, mixtures, compounds, or other substances into the Distribution System from a source or sources other than its intended source. The Jackman Utility District shall not permit any cross-connection at any point within its system.

What are cross connections and why are we concerned about them? A cross connection is a connection between a potable water system and a non-potable system. It can lead to contamination of a public water system with the results ranging from an aesthetic problem to illness or death and possible lawsuits.

A cross connection can be either direct or indirect. A direct connection is one where an actual physical connection exists such as a line to a chemically treated boiler or a bypass around a backflow prevention device. An indirect connection is one where the potential exists for a connection to be created such as a garden hose which can be submerged in a bucket of soapy water or connected to a pesticide sprayer.

Contamination will result when a cross connection exists and backflow or a reversal of flow occurs. There are two types of backflow: backsiphon and back pressure. Backsiphon results when there is a negative pressure in the system and the contaminant is pulled into the drinking water supply. This can be caused by such items as a main break or large fire demand. Back pressure occurs when the pressure on the non-potable system is greater than the potable system and the contaminant is pushed into the drinking water system. This can be caused by such items as a boiler or pump in the distribution system.

# Definitions

***Air gap:*** The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or outlet supplying water to a tank, plumbing fixture, or other device and the flood level rim of the receptacle. The vertical physical separation shall be at least two times the inside diameter of the water inlet pipe above the flood rim level but shall not be less than one inch.

***Anti-backflow device:*** A device or means to prevent backflow.

***Approved source:*** A source of water utilized by a public water system for distribution to the public for consumption or other purposes and which is approved by the Drinking Water Program (DWP) for said use following an approved treatment process, if any, required by the DWP. The water that leaves the JUD treatment plant is an approved source.

***Auxiliary Water:*** Any water, except drinking water, that is pressurized for use, treatment or disposal on, or available to, a site served by JUD. Our raw water hydrant or main could be considered auxiliary water.

***Backflow:*** The flow of water or other foreign liquids, gasses, mixtures, compounds or other substances into the public water distribution system from any other than intended.

***Backflow Preventer:*** A device or means to prevent backflow.

***Backflow prevention device tester, certified:*** A person who has completed and passed a course on the testing of backflow prevention administered or approved by the Drinking Water Program.

***Back Pressure:*** A condition where the owner's pressure is greater than the supplier's system pressure, causing a reversal of the normal direction of flow.

***Backsiphonage:*** Backflow resulting from negative pressure in the distribution pipes of a public water supply system.

***Containment:*** A method of backflow prevention, which requires a backflow preventer at the water service entrance.

***Contamination:*** Any physical, chemical, biological or radiological foreign substance that tends to degrade water quality so as to constitute a hazard or to impair its usefulness.

***Cross-connection:*** Any actual or potential connection between the public water supply and a source of contamination or pollution.

***Degree of Hazard:*** The evaluation of a health, system, plumbing or pollution hazard.

**Department:** State of Maine, Department of Human Services (DWP).

**District:** Jackman Utility District (JUD)

**Double check valve assembly(DCVA):** A device which contains two independently acting check valves located between two tightly closing shut-off valves and fitted with properly located test cocks.

**Fire Sprinkler System:** An integrated system of underground and overhead piping designed to provide fire protection for a building or structure. The installation includes one or more automatic water supplies. The portion of the sprinkler system aboveground is a network of specially sized or hydraulically designed piping installed in a building, structure, or area generally overhead, and to which sprinklers are attached in a systematic pattern. The valve controlling each system riser is located in the sprinkler riser or its supply piping. Each sprinkler system riser includes a device for actuating an alarm when the system is in operation. The system is usually activated by heat from a fire and discharges water over the fire area.

**Fixture Isolation:** A method of backflow prevention in which a backflow preventer is located to prevent a cross-connection at an in-plant unit rather than at the water service entrance.

**High Hazard:** a contamination hazard, as defined in the Maine State Internal Plumbing Code as 02-395 CMR 4. If a backflow were to occur, the resulting effect on the water supply could cause illness or death if consumed by humans. The foreign substance (contaminant) may be toxic and/or harmful to humans either from a chemical, bacteriological, or radiological standpoint. The effects of the contaminants may result from a short or long term exposure.

**Low Hazard:** a pollution hazard, as defined in the Maine State Internal Plumbing Code as 02-395 CMR 4. If a backflow were to occur, the resulting health significance would be limited to changes in aesthetic quality such as taste, odor or color. The foreign substance must be non-toxic and non-bacterial in nature with no significant health effect.

**Owner:** Any individual, tenant, corporation, political body or sub-division or any other entity who has legal title to operate or habituate in a property upon which a cross-connection is present.

**Permit:** A document issued by the JUD with the approval of the DWP, which allows the user the use of a backflow preventer.

**Person:** Any individual, partnership, company, public or private corporation, political sub-division or agency of the State, instrumentality of the United State or any other legal entity.

**Potable water:** Approved water, free from impurities present in any amount sufficient to cause disease or harmful physiological effects. Its physical, chemical, bacteriological and radiological quality conforms to the Maine State Drinking Water Act, or any regulations pertaining thereto.

**Private water source:** Any source of water which may or may not be approved by the Department, utilized by any Owner for consumptive and/or other purposes, and which is not under the immediate control of the Supplier.

**Public water system:** Any publicly owned system of pipes, structures, and facilities through which potable water is sold, furnished or distributed to the public for human consumption, and which is under control of the supplier. The system shall not include the portion of service pipe owned and maintained by the Owner.

**Reduced pressure principle backflow preventer -** A device containing within its structure a minimum of two independently acting, approved check valves, together with an automatically operating pressure differential relief valve located between the two check valves. The first check valve reduces the system pressure a predetermined amount so that during normal flow and a cessation of normal flow the pressure between the checks shall be less than the system pressure. In case of leakage of either check valve, the differential relief valve, by discharging to atmosphere, shall operate to maintain the pressure between the checks less than the system pressure. The unit shall include tightly closing shut-off valves located at each end of the device and each device shall be fitted with properly located test cocks.

**Residential Dual Check Valve(RDC):** An assembly of two independently acting check valves used primarily on residential and low-hazard services.

**Residential Hazard:** Any connection that has the same level of hazard as a typical residential household. Public water suppliers can increase protection from residential cross connection hazards using anti-backflow devices at the discretion of the supplier.

**Supplier:** Jackman Utility District (JUD)

**Water service entrance:** That point which the Owners water system is beyond sanitary control of the Supplier. This will ordinarily be the outlet of the water meter and will always be before the first branch line.

**Authority**

This program gains its enforceability from the Federal Safe Drinking Water Act of 1974, Title 22, MRSA 42(1), 42(3), 2612 (2) and 10-144 MRSA Chapter 226 (State of Maine Cross-Connection Rules). In addition, authority arises from provisions in the State of Maine Plumbing Code as administered by Maine's Department of Professional and Financial Regulations 02-395 CMR 4.

**Scope:**

It is the intent of the District that all domestic water services, both new and existing, be equipped to prevent backflow or backsiphonage through the "containment" approach. This approach isolates the customer from the water main; however this may not protect the customer within their own building. The District is not responsible for any cross-connection beyond the water service entrance. This program also requires that all RPZ's and DCVA's successfully pass an annual test and residential dual checks be tested periodically as water meters are repaired or replaced. This program requires the installation of an approved backflow prevention device at the water meter by the owner at the owner's expense.

Fixture isolation alone is not deemed an acceptable method of backflow prevention by the District within its distribution system. Installation of and continued testing and proper functioning of a cross-connection prevention device, RPZ, DCVA or RDC, is a condition of service.

Recognizing that many tenants assume responsibility for cross-connection prevention and act as the owner's representative, the property owner is ultimately responsible for compliance with the District's cross-connection control program.

Unless otherwise specified, the Maine State Internal Plumbing Code and the State of Maine Cross-Connection Rules are the minimum acceptable standards. The District may adopt more stringent requirements.

**Administration and Approval**

As required by the State of Maine, the District will operate a cross-connection prevention program, including keeping necessary records, which fulfills the requirement of the DWP's Cross-Connection Rules and which is approved by the DWP. The District will review its program at its discretion, and modifications will be submitted to the DWP for approval.

An employee of the District or its agent, having properly identified himself, will have free access at reasonable hours to all premises supplied with District water to conduct a cross-connection survey to determine backflow prevention needs and whether the needs have been met. Access to the property for a cross-connection survey is a condition of service with the District. The District will determine the appropriate means of backflow prevention based on its approved program, and the Owner will comply with the District's recommendations.

If the District determines at any time that an imminent threat to public health exists, service will be terminated immediately and without written warning.

## **Requirements**

A cross-connection will not be allowed unless the District approves it as necessary. All cross-connections will be protected by backflow prevention devices, assemblies, and methods specified in the Maine State Internal Plumbing Code.

**New Installations:** The district will determine the degree of hazard and the required backflow prevention based on inspection of plans, an on-site inspection, or as per recommendation of a licensed plumber or engineer.

**Existing installations:** The owner or a representative thereof will inform the District of any changes in hazard, and may request an inspection for hazard reclassification. Existing devices may continue in service unless the degree of hazard supersedes the effectiveness of the device, or poses an unreasonable risk to public health.

**Review:** Cross-connections will be reviewed for re-approval at the discretion of the District. If no change in hazard has occurred, approval is automatically granted. If a change in hazard has occurred, a modification in cross-connection protection may be required.

**Information:** The District may require copies of plans, drawings, reports, or specifications related to the service connection or cross-connection at the Owner's expense.

## **DEVICES**

There are several backflow prevention assemblies used to prevent backflow into a potable water system. The following is a description of the types of devices accepted by JUD and their application. JUD enforces containment and will allow RPZ's, DCVA's and RDC as acceptable devices to provide protection to the distribution system.

### **AIR GAP :**



An air gap is not actually a device. It is a type of protection that would be acceptable backflow prevention between all potable water lines and equipment or systems which may be subject to contamination. An air gap can be used for all toxic substances. An air gap is a physical unobstructed separation through free atmosphere between the free flowing discharge end of any pipe or outlet supplying potable water and the flood-level rim of a receiving receptacle. The air gap, when properly maintained and inspected, is the most reliable means of protection because it is not subject to mechanical failure. However, backflow prevention devices are substituted in place of an air gap in many cases because of operational problems such as loss of pressure or the introduction of

contaminated air into the water supply. An approved air gap shall be installed with a minimum separating distance of at least two times the inside diameter of the water supply pipe (measured vertically above the flood level rim of the receptacle). In no case, however, shall the separation be less than one inch. Careful attention must be paid in situations where a hose or extension piece can be attached to the potable water supply line. Fixtures equipped with an air gap must be re-inspected periodically to make sure that the air gap is not bypassed.

Typical Uses: bathtubs; sinks; swimming pool fill inlets; fills for tank trucks and spraying equipment

### **RESIDENTIAL DUAL CHECK**



The Residential Dual check valve is used in low hazard situations such as those found in residential homes or offices. They should be tested when repair is done on the water meter by removing the meter and seeing if water drains from the house plumbing. If it does the checks may be fouled and should be removed and cleaned, inspected and possibly replaced.

### **DOUBLE CHECK VALVE ASSEMBLY**



The double check valve assembly (DCVA) is approved only for use through which foreign material might enter the potable system in concentration which would constitute a nuisance or be aesthetically objectionable, such as air, steam, food,, or other material with does not constitute a health hazard. The Double Check Valve Assembly consists of two internally spring loaded check valves, two resilient seated shutoff valves, and four properly located resilient seated test cocks. This assembly shall be installed as a unit as furnished by the manufacturer. This assembly is effective against backflow caused by back pressure and back-siphon age. It is critical that all DCVAs be installed with adequate space consideration for testing, repair, and maintenance. All assemblies require



a minimum clearance for removal of pins and/or check assemblies. All DCVAs shall be tested after installation and repairs to insure their proper installation and satisfactory operation. Be careful to insure that the assembly is not installed where the temperature and pressure is maintained above the assembly's rated and labeled capacities. Thermal water expansion and/or water hammer downstream of the assembly can cause excessive pressure. To avoid possible damage to the system and assembly from this situation, use water hammer arresters or surge protectors. Have the assembly sized hydraulically to avoid excessive pressure loss. The head loss is not necessarily proportional to flow. Some assemblies have a high head loss at low flows and low head loss at high flows. The water purveyor is not responsible for sizing backflow prevention devices. In areas where debris content in the water supply is high, good plumbing practice recommends a strainer with blowout tapping ahead of the assembly. THOROUGHLY FLUSH THE LINES BEFORE INSTALLING THE ASSEMBLY. Years of experience have shown that most "failure to test satisfactory" results in new installations are caused by debris fouling one of the check valves or the relief valves.

**REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTERS**

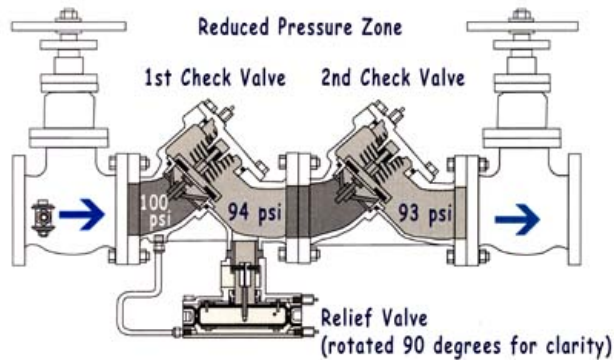


FIGURE 2 - Reduced Pressure Principle Backflow Preventer

Also called RPD or RPZ (zone). These devices are the best mechanical protection made and are used for high hazard applications. Reduced pressure devices consist of two independently operating spring loaded check valves with a relief port assembly between the two checks, adding up to three securities. If both checks fail the relief port would be the third protection against backflow. The high reliance factor simply derives from the fact that as these devices are tested once every year so it is highly unlikely that all three securities will fail within that time period. RPZs work under the principle, that water passing through a sequence of two spring loaded check valves, has less or reduced pressure after passing through the first check valve, compared to the supply pressure before the check. A minimum of 5 pounds for the spring -load of the first check is required, while the second check usually has only 1 pound. That means that if the supply pressure were 60 PSI, the water in the reduced pressure zone would have at least 5 PSI less pressure and after passing through the second check an additional 1 PSI less pressure. So, based on the fact that the pressure between the two checks is reduced or less than the incoming supply pressure, the relief port is held shut by routing the supply (full) pressure against a diaphragm that works against the spring load of the relief port. The spring load on the relief port must be no less than 2 pounds, so that when the supply

pressure drops to less than 2 pounds difference (between supply side and reduced pressure zone) the relief port will open and drain the water out of the reduced pressure zone.

1. All RPZ's should be installed in an easily accessible area to facilitate maintenance and testing. Have plumbers contact the JUD prior to installation to verify the location of the device. (Check manufacturers recommendation for minimum clearance, etc.)
2. Do not install an RPZ in a structure below ground level unless approved provisions are made to keep the pit dry. If a device is installed in a deep chamber, the chamber should be well ventilated, drained by gravity and have a removable top to facilitate access to the device.
3. Bypassing an RPZ during testing or repair is prohibited. Installation of another RPZ in parallel is required if continuous supply is required.
4. RPZ's should be located in an area where water spillage is not objectionable. A drain, capable of handling the maximum flow from the relief port should be provided but is not mandatory. However, when installing a drain for the relief valve an air gap must be provided between the drain and the relief port. All devices must be protected against freezing, flooding, and mechanical damage.
5. When installing an RPZ on the feed line to a pressure vessel, always install the pressure relief between the RPZ and the pressure vessel. On fire sprinkler systems, always install the RPZ (before) upstream of the Siamese connection.
6. The District recommends that strainers be installed on double-check and reduced pressure zone valves directly upstream of the device to prevent possible fouling of the device by both foreseen and unforeseen circumstances such as water main breaks, fires, flushing mains, which may stir up debris within the water main and cause fouling of the backflow device.

### **Degree of Hazard & Type of Backflow Prevention Required**

There are several hazards which require cross connection protection that are found in many facilities regardless of the specific activities conducted on the premises.

The owner shall install a reduced pressure principle backflow preventer (RPZ) or an air gap in the following instances:

- On an Auxiliary Water System line; No physical connection shall be permitted between the distribution system of a potable public water supply and that of any other water supply, unless the other water supply is of safe, sanitary quality and the interconnection of both supplies is approved by the DWP.
- A line feeding a Tank Truck; The hazards normally found with tank trucks and sprayers is a cross connection between the public water supply and: (1) a fill pipe which becomes submerged in the tank during filling. (2) hydro seeders, sweepers, sewer vacuums, sewer rodders or lawn maintenance equipment which may be subject to back-siphon age during use.
- On a line feeding a Greenhouse; The hazards normally found at greenhouses are cross connections between the public water supply and: (1) chemical injectors; (2) irrigation systems; (3) hoses left running on the floor or in planters where there is a possibility of back-siphon age; (4) steam generating facilities which may be contaminated with boiler compounds.

- On a line feeding a Commercial Food Service Restaurant, Bar or Food Establishment; The hazards normally found in these types of facilities would be cross connections between public water supplies and: (1) dishwashing sinks particularly with detergent injectors; (2) deep sinks with aspirators with soaps, detergents, etc. (3) janitorial sinks; (4) toilets and urinals; (5) air conditioning units piped directly to sewers; (6) steam generating facilities which may be contaminated with boiler compounds; (7) water cooled equipment such as air conditioners, which may be connected to the sewers; (8) garbage can washers; (9) garbage disposal units; (10) soda equipment, espresso boilers with salt filters; (11) lawn sprinklers; (12) jacketed coffee urns.
- On a line feeding a Commercial Food Processing such as bottling companies, canneries, or meat packaging; The hazards normally found in this type of facility would be cross connections between the public water supply and: (1) steam connected facilities such as pressure cookers, autoclaves, etc.; (2) equipment used for washing, cooking, cleaning, blanching, flushing or for transmission of foods; (3) fertilizers or wastes; (4) can and bottle washing machines and lines where caustics, acids, detergents, and other compounds are used in cleaning, sterilizing, etc; (5) cooling towers and circulating systems which may be contaminated with bird droppings, vermin, algae, bacterial slimes, or with toxic water treatment compounds; (6) steam generating facilities and lines which may be contaminated with boiler compounds.
- On a line to a School or University; The hazards normally found in a facility of this type include cross connections between the consumer's water system and: (1) contaminated and/or sewer connected facilities such as inadequately protected flush valve toilets, urinals, aspirators, retorts, pipet tube washers, etc.; (2) laboratory equipment which may be chemically or bacteriologically contaminated; (3) steam sterilizers, autoclaves, specimen tanks, autopsy and morgue equipment; (4) steam generating facilities and lines which may be contaminated with boiler compounds; (5) water cooled equipment which must be sewer connected such as compressors, heat exchangers, air conditioning equipment, etc. (6) high pressured coil systems; (7) irrigation systems which may be equipped with pumps, injectors, or other facilities for injecting chemicals or subject to contamination from submerged inlets, auxiliary water supplies, or polluted or contaminated waters; (8) tanks, automatic film processing machines or facilities; (9) auxiliary water supplies; (10) lab sinks and other hose connections.
- On a line to fire sprinkler systems (including tanks) where chemicals are added or to foam firefighting systems; Fire Sprinkler systems are a concern because the pressure and volume demands in a fire emergency can draw non-potable water into the public water supply system.
- On a line used to supply Car Wash facilities; The hazard normally found with this type of facility would be a cross connection between the public water supply and: (1) the scrubber and rinsing plumbing, which would enable a recirculating pump to force recycled water back into the public water supply; (2) water booster pumps.
- On a line feeding an Automobile, ATV, Snowmobile Repair Facility; The hazards normally found with these types of facilities are cross connections between the

- public water supply and: (1) submerged inlets into testing tanks where chemicals are present; (2) rinse hoses lying on the floor stuck into tanks; (3) steam generating lines which may be contaminated with boiler compounds.
- On a line to a Funeral Home or Mortuary; The hazards normally found in this type of facility include cross connection between the public water supply and: (1) prep room equipment such as hose connections and aspirators; (2) boilers with chemicals added.
  - On a line feeding a Medical Laboratory; The hazards normally found in this type of facility are cross connections between the public water supply and: (1) lab sinks and hose connections; (2) pipet washers, sterilizers, autoclaves, etc.; (3) sewer lines for the purpose of disposing of samples, etc.; (4) filter equipment, deionizers, membrane filters, distillers.
  - On a line feeding a Doctor or Dentist Office; The hazards normally found in these facilities are cross connections between the public water supply and: (1) autoclaves; (2) specimen tanks; (3) sterilizers; (4) aspirators; (5) laboratory sinks; (6) dental suction hoses; (7) X-ray equipment; (8) air compressor lines; (9) water cooled equipment such as air conditioning equipment which may be connected to sewers.
  - On a line to an Animal Hospital or Grooming Establishment; The hazards normally found in this type of facility would be a cross connection between the public water supply and: (1) bath tubs where animals are washed with chemicals for treatment of fleas, skin disorders, etc.; (2) hoses used to wash wastes from pens and run areas; (3) medical equipment such as X-ray development.
  - On a line to irrigation or lawn sprinkler systems where chemicals are added; Irrigation systems are a concern because of the likelihood that chemicals will be added to the system or applied to the ground. This would include any pesticides, herbicides, or fertilizer applications. When chemicals are applied to the ground they may be introduced into the water system through the inlets on in ground sprinkler heads.
  - On a line feeding a Sewage Plant, Pump Station, or Dump Station; The hazards normally found include cross connections between the public water supply and sewage pumps for priming, cleaning, flushing or unclogging purposes; water operated sewage sump ejectors; chlorinators using potable water when disinfecting waste water; sewer lines for purpose of disposing of filter or softener backwash water or water from cooling systems.
  - On a line feeding a Hospital, Convalescent or Nursing home; The hazards normally found in facilities of this type include cross connections between the public supply and:(1) contaminated or sewer-connected equipment such as bedpans washers, flush valve toilets and urinals, autoclaves, specimen tanks, sterilizers, aspirators, autopsy and mortuary equipment laboratories; (2) sewer lines for the purpose of disposing of filter or softener backwash water; (3) water cooled equipment such as compressors, heat exchangers, air conditioning equipment, etc; (4) high pressured coil systems; (5) cooling towers which may be heavily contaminated with bird droppings, vermin, algae, etc., or with toxic water treatment compounds; (6) steam generating facilities and lines; (7) kitchen and food processing equipment including dishwashers, ice makers, carbonated

- beverage machines; (8) hemodialysis units; (9) auxiliary emergency water supplies.
- On a line feeding a Beauty Salon, Barber Shop, Beauty School; The hazards normally found in these facilities are cross connections between the public water supply and hair wash sinks that have hoses for rinsing hair during washing, dying or other chemical treatments.
  - On a line feeding a Photo Developer; The hazards normally found in this type of facility are a cross connection between the public water supply and tanks or automatic film processing machines which may be contaminated with chemicals.
  - On a line to all Boiler Systems where chemicals are added; Boilers are a concern because chemicals are often added or the water is otherwise rendered non-potable. If there was a loss of pressure in the system, this non-potable water could enter the plumbing system. If the facility operator is uncertain as to whether or not chemicals are or have been added, protection should be required.
  - On a line to Heat Exchangers where chemicals are added; Air conditioning units, heat exchangers and other water cooled equipment are a concern because they may be connected to the sewer system, may be contaminated with algae or bacterial slime, or may be treated with chemicals. These units are found in numerous types of facilities and require backflow protection to prevent introduction of the contaminated water into the potable water system.
  - On a line to Solar Heating Systems where chemicals are added; The hazards normally found with solar heating and/or cooling systems include cross connections between the public water supply and: (1) reservoirs and/or solar collector fluids which may have antifreeze, toxic corrosion inhibitors, or non-potable water; (2) single wall heat exchanges between the consumer's water and non-potable water or fluids; (3) negative pressure zones created by circulation pumps.
  - On a line to a Marina or Docks; The hazards normally found in water front facilities include cross connections between the public water supply and: (1) outlets available for supplying water to docks using common garden hoses; (2) large supply lines used to supply drinking water for larger seagoing vessels; (3) kitchen/restaurant facilities such as dishwashers, ice machines, carbonated beverage machines; (4) gas tanks which hydraulically raise gas levels; (5) cooling towers; (6) fire protection systems; (7) high pressure washing systems; (8) motor testing tank with bottom feeds.
  - On a line feeding a Swimming Pool, Bait Shop; The hazards normally found at swimming pools are cross connections between the public water supply and: (1) below rim inlets; (2) hoses left running and dropped into the pool; (3) direct connections at the chlorination equipment; (4) steam generating facilities and lines which may be contaminated with boiler compounds.
  - On lines feeding Laundries, Dry Cleaners or Dye Works; The hazards normally found in this type of facility are cross connections between the public water supply and: (1) laundry machines having under rim inlets; (2) steam generating facilities which may be contaminated with boiler compounds; (3) water storage tanks equipped with recirculating pumps; (4) dye vats using chemicals; (5) high

pressure coil heat exchangers; (6) sewer connected compressors; (7) dry cleaning equipment with solvents and heat exchangers.

- On a line feeding a service hooked to a Well; A private well owner, with a contaminated well who elects to receive water service from a public water system main, should abandon the contaminated well. In the event the private well owner decides to retain the contaminated well for non-domestic water use, the following apply: The private well water system (i.e. well, pump and tank) shall be physically disconnected from the building plumbing. The public water system shall inspect the physical disconnection.
- On a line with a Booster Pump; Home booster pumps have been used in the past to add customers on water lines that cannot provide adequate water pressure. A minimum of 20 pounds per square inch (psi) shall be provided at the main under normal conditions unless a special provision is made.
- On a line to a Motel, Hotel Cabin Commercial Style; The hazards normally found in building of this type include cross connection between the consumer's water system and firefighting system, a commercial dishwasher, laundry unit or the facility may be feeding the customers in a larger local area such as a cafeteria or continental breakfast area, a dining room or bar area.
- On a line to a RV Park or Campground;
- On a line to an Oil and Gas Production, Storage or Transmission Property; The hazards normally found in a plant of this type include cross-connection between the water system and the steam boiler and lines; dehydration tanks and outlet lines form storage and dehydration tanks for purging purposes, oil and gas lines for testing, firefighting systems, hydraulically operated equipment, equipment under hydraulic test.
- Water supply lines to carbonators for beverage machines, water conditioning systems, and commercial ice making equipment;

The owner shall install a double check valve assembly (DCVA) in the following instances:

- On public water supply lines to fire sprinkler systems with Siamese connections unless chemicals are added to the fire sprinkler system. Where chemicals are added to such systems, the owner shall install an RPZ. An owner may install an RPZ instead of a DCVA on public water supply lines to fire sprinkler systems with Siamese connections.

Annual testing of RPZ's and DCVA's is necessary to assure that they continue to operate properly and serve the purpose for which they were installed. The interval between tests should not exceed one (1) year. New devices should be inspected and tested shortly after installation to assure that they have been installed properly and debris resulting from the installation has not interfered with the function of the device. At the time of testing you should always check that the device has not been bypassed.

The owner shall install a Residential Dual Check Valve in the following instances:

- On a line feeding a residential apartment building
- On a line feeding a home office

- On a line feeding a home food service business
- On a line feeding a residential home
- Motel, Hotel, Cabins Residential Style; A residential one does not have commercial equipment and provides the guests with residential style living.

The Jackman Utility District requires all new residential buildings be required, at the owners' expense, to install a residential dual check device immediately downstream of the water meter. It is important to notify the owner that installation of a residential dual check valve results in a potential closed plumbing system within the residence and provisions may have to be made, at the owner's expense, to provide for thermal expansion within the closed loop by the installation of a thermal expansion device or pressure relief valve. (Example expansion tank on the cold water line)

### **District Responsibilities**

Records and Reports: The District will

- ✓ Maintain a copy of its current approved Cross-Connection Prevention Program, and will make it available on request.
- ✓ Maintain records of devices and required tests in accordance with the State of Maine Cross-Connection Rules.
- ✓ Recognize backflow preventer testers who have successfully completed a training course recognized by New England Water Works Association or American Backflow Prevention Association. The District reserves the right to observe testing as performed by any certified individual.

Periodic Inspections:

- ✓ Determine the degree of hazard and the appropriate cross-connection prevention device required.
- ✓ Base the requirement on the hazard observed during inspection, the current use of the building, or other related information. A change to higher or lower hazard classification must be approved by the District, and may occur should new information be received or observed.
- ✓ Perform needed inspections for actual or potential cross-connection during normal working hours. At its discretion, the District may perform the inspection, with costs borne by the owner, outside of normal business hours.
- ✓ Provide notification of any necessary installation, correction or change, the time allowed for correction, and any additional responsibility, such as required testing.
- ✓ Allow a maximum of 30 calendar days from initial written notification for correction, unless the safety of the system or public health is at risk.
- ✓ Inspect the installation when completed as required.
- ✓ Reserve the right to perform periodic testing, at its cost, of any device in its system.

Periodic Testing:

- ✓ Recognizing that any backflow preventer can fail and any method of protection can be subverted.
- ✓ Determine the testing intervals for each device.
- ✓ Provide notification in advance of the testing deadline.

- ✓ Inspect dual check devices at no charge following installation and when a water meter is changed.
- ✓ Require a successful test for service lines with an RPZ or DC typically active for more than 90 consecutive days, once each calendar year, notification at least four months in advance.
- ✓ Require a successful test for service lines with an RPZ or DC typically active less than 90 consecutive days, within 10 calendar days of service line activation, notification prior to or at time of activation.
- ✓ Require tests more frequently, at the owner's expense, based on a history of test failure or on the degree of hazard.
- ✓ Require repairs or replacement by deadline set by the District (typically 10 business days) at owner's expense. Regarding backflow preventers which fail during testing, the District may require that repair parts be ordered within 24hrs and that shipment is by the fastest means possible. Furthermore, any extended delay (more than 10 business days) may require discontinuance of service or other means to ensure protection of the public water system. Certain high hazard situations which, in the Districts determination pose a threat to public safety, will not be allowed to continue unprotected if the backflow preventer fails the test and cannot be immediately repaired. The District does not perform repairs on backflow preventers, the Owner is responsible for the provision of spare parts, repair tools, or replacement devices, and should have a supply on hand.

Disconnection for Non-Compliance: the District will commence disconnection proceedings in the manner specified under Chapter 660 of the Maine Public Utilities Commission regulations.

**VII. Property Owner Responsibilities:** The owner will, at his/her expense, comply with program requirements, including

- ✓ Providing access for inspection or testing.
- ✓ Allowing no unprotected cross connections including bypass lines.
- ✓ Installing of appropriate backflow prevention device in compliance with District recommendations.
- ✓ Providing maintenance or replacement to ensure a successful test.
- ✓ Providing testing by an accepted tester whose license is current by the specified deadline.
- ✓ Providing written test results to the District signifying the device is functioning properly.
- ✓ Providing information to the District if property use would require a change in cross-connection protection (new, existing, proposed, or modified).



# Summary

The purpose of this Cross Connection Prevention Program is to assure safety to all customers' services by the Jackman Utility District. Having this program in place will protect our customers in the event of an unplanned interruption of water service. During an unplanned interruption in water service occurs (i.e., source failures, power outages, main breaks, etc.), a set of circumstances is created that poses a threat to water quality. Atmospheric and negative pressures created in the distribution system can permit ground and surface water to enter the system via joints, cracks, and holes in the piping network and set the stage for cross connections to contaminate the system. Despite a public water supply's best efforts to ensure a tight distribution network free of cross connections, no system can be totally immune from the threat of a water quality problem in the event of water service interruption. When an unplanned interruption in water service occurs the following precautions should be implemented:

- a. Consumers should be notified of the interruption.
- b. After repairs are made, the repaired area should be disinfected in accordance with AWWA standards.
- c. Upon resumption of water service, chlorine dosage rates should be increased as a precaution against increased chlorine demand due to the possible introduction of bacteria and sediments into the system.
- d. Free chlorine residuals should be tested at remote areas of the system and chlorine dosages increased until at least a free residual is detected at all points in the system.
- e. If a free chlorine residual cannot be maintained:
  - (i) Consumers should be placed on a Boil Water Order.
  - (ii) Distribution water samples should be collected immediately in the areas of inadequate chlorine residual and analyzed for coliform bacteria.
  - (iii) If the coliform bacterial results are negative, consumers should be notified that the water is safe to consume; however, if the results are unsatisfactory, boiling notices should remain in effect;

Auxiliary Water System	High Hazard	RPZ
Animal Hospital, Kennel, Grooming	High Hazard	RPZ
Automobile, ATV, Snowmobile Repair	High Hazard	RPZ
Barber/Beauty Shop School	High Hazard	RPZ
Boiler System added chemicals	High Hazard	RPZ
Booster Pump	High Hazard	RPZ
Car Wash	High Hazard	RPZ
Commercial Food Service, Rest. & Bar	High Hazard	RPZ
Commercial Food Processing	High Hazard	RPZ
Doctor/Dental Offices	High Hazard	RPZ
Fire Suppression system	High Hazard	RPZ/DCVA
Florist/Greenhouse	High Hazard	RPZ
Heat Exchangers	High Hazard	RPZ
Hospitals, Nursing Homes	High Hazard	RPZ
Hotels, Motels, Cabins, Apt. Commercial	High Hazard	RPZ
Hotels, Motels, Cabins Apt. Residential	Low Hazard	RDC
Medical Laboratory	High Hazard	RPZ
Laundromats, Dry Cleaners	High Hazard	RPZ
Marina or Docks	High Hazard	RPZ
Mortuaries & Funeral Homes	High Hazard	RPZ
Oil and Gas Production, Storage, Trans.	High Hazard	RPZ
Photo Developer, Dark Room, Print Shop	High Hazard	RPZ
Residential Homes, Office, Food Service	Low Hazard	RDC
R.V. Parks and Campgrounds	High Hazard	RPZ
School or University	High Hazard	RPZ
Solar Heating System	High Hazard	RPZ
Sprinkler or Irrigation Systems	High Hazard	RPZ
Swimming Pools/Bait Shops	High Hazard	RPZ
Sewage Plant, Pump Station, Dump Station	High Hazard	RPZ
Tank Trucks	High Hazard	RPZ
Wells	High Hazard	RPZ

RPZ – Reduced Pressure Zone Principal Device

DCVA- Double Check Valve Assembly

RDC- Residential Dual Check

Any device installed after 7/1/12 must be NSF61 certified for lead content. All anti-backflow devices must be listed and labeled in the Maine State Internal Plumbing Code.

# *Cross Connection Survey*

## *Jackman Utility District*

Name/Owner: \_\_\_\_\_ Phone #: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Water Service Size: \_\_\_\_\_ Trio Account #: \_\_\_\_\_  
 Date of Inspection: \_\_\_\_\_ Name of Inspector: \_\_\_\_\_

Water used for:

- Axillary Water System
- Animal Hospital, Kennel, Grooming
- Automobile, ATV, Snowmobile Repair Garage
- Barber/Beauty Shop School
- Boiler System \_\_\_ w/ chemicals \_\_\_ w/out chemicals
- Booster Pump
- Car Wash
- Commercial Food Service or Processing, Restaurant, Bar
- Doctor, Dental Office, Hospital, Nursing Home, Medical Laboratory
- Fire Suppression System \_\_\_ W/Chemicals \_\_\_ W/Out Chemicals
- Florist/Greenhouse
- Heat Exchanger
- Hotel, Motel, Cabin, Apartment Commercial Setting # of Units \_\_\_\_\_
- Irrigation System \_\_\_\_\_ W/chemical addition \_\_\_ W/out chemical addition
- Laundromat, Dry Cleaners
- Marina or Docks
- Mortuary & Funeral Home
- Oil and Gas Production, Storage or Transmission
- Photo Development, Dark Room, Print Shop
- Public Gathering areas with commercial equipment
- RV Park, Campground
- School or University
- Solar Heating System
- Swimming Pool, Bait Shop
- Sewage Plant, Pump Station, Dump Station
- Tank Truck
- Well

If any of the above are checked the location requires the installation of an RPZ or DCVA.  
 If none of the above are checked proceed to the next category.

- Apartment Building \_\_\_\_\_ # Units
- Hotel Motel Cabin Residential Style \_\_\_\_\_ # Units
- Residential Home, Office, Food Service \_\_\_ W/Out Commercial Equip
- Public Gathering area w/out commercial equipment

If any of the above are checked the location requires the installation of a RDC.