

READING AREA WATER AUTHORITY

**AMENDED AND RESTATED RESOLUTION FOR THE  
CONTROL OF BACKFLOW AND CROSS-CONNECTIONS**

Originally Adopted September 23, 2003

Amended and Restated January 28, 2010

Whereas, Reading Area Water Authority ("RAWA") to protect the public water supply has determined to adopt the following Resolutions controlling backflow prevention devices and cross-connections;

NOW, THEREFORE, be it resolved, by the Board of RAWA in lawful session duly assembled this 28th day of January, 2010, and hereby it is resolved, as follow:

**Section 1 General Policy**

Purpose. The purpose of these Resolutions is:

To protect the public water supply from contamination or pollution by isolating, within the consumer's water system, contaminants or pollutants which could backflow through the service connection into the public water supply system.

To promote the elimination or control of existing cross-connections, actual or potential, between the public or consumer's water supply and non-potable water systems, plumbing fixtures and sources or systems containing process fluids.

To provide for the maintenance and continuation of a cross-connection control program which prevents the contamination or pollution of the public and consumer's water supply.

Application. RAWA and the consumer have the joint responsibility for protection of the public water supply from contamination or pollution due to backflow. If RAWA requires an approved backflow prevention device, RAWA shall give notice to the consumer to install such an approved backflow prevention device at each service connection to his premises. The consumer should immediately install such an approved device or devices at his own expense. Failure, refusal, or inability on the part of the consumer to install such a device or devices shall constitute grounds for discontinuing water service to the premises until such a device or devices have been installed.

**Section 2 Definitions**

For the purpose of these Resolutions, the following words shall have the meaning indicated unless clearly indicated otherwise in the text:

1. **Air Gap Separation** - The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying potable water to a tank, plumbing fixture, or other device and the flood level rim of the receptacle. The differential distance shall be at least double the diameter ( $2 \times D$ ) of the supply pipe measured vertically above the top of the rim of the vessel. In no case, shall the air gap be less than one inch.
2. **Approved** - A backflow prevention device or method that has been accepted by RAWA as suitable for the proposed use.
3. **Atmospheric Vacuum Breaker (AVB)** - A fixture outlet device containing an optional shutoff valve followed by a valve body containing a soft-seated float-check, a check seat and an air inlet port. If the shutoff valve is open, the flow of water causes the float to close the air inlet port. If the shutoff valve is closed, the float falls and forms a check valve against backsiphonage and at the same time opens the air inlet port. If no shutoff valve is provided, the flow of water will determine the opening and closing of the air inlet port.
4. **Auxiliary Water System** - Any water source or system on the premises of, or available to, the customer except connections to other approved community water supply systems.
5. **Backflow** - A flow condition, induced by a differential in pressure, that causes the flow of water or mixtures of water and other substances into the distribution pipes of a potable water supply system from a source other than its intended source. Backflow can result from either backsiphonage or backpressure.
6. **Backflow Preventer** - A device or other means which will prevent the backflow of water or any other substance into the public water supply system.
7. **Backpressure** - The backflow of water or a mixture of water and other substances from a plumbing fixture or other customer source, into a public water supply system due to an increase of pressure in the fixture or customer source to a value that exceeds the system pressure.
8. **Backsiphonage** - The backflow of water or a mixture of water and other substances from a plumbing fixture or other customer source, into a public water supply system due to a temporary negative or sub-atmospheric pressure within the public water supply system.
9. **Consumer** - The owner or person in control of any premises supplied by or in any manner connected to a public water supply system.
10. **Consumer's Water System** - Any water system, located on the consumer's premises, supplied by or in any manner connected to a public water supply system. A household plumbing system is considered to be a consumer's water system.
11. **Containment** - Cross-connection control which isolates the customer's entire facility from the public water supply system so as to provide the protection necessary to prevent

contamination of the public water supply in the event of backflow from the customer's facility. Though containment control prevents contamination of the public water supply, it offers no protection to the water distribution system within the facility. Reduced pressure zone devices are used for containment control.

12. **Contamination** - The degradation of the quality of the drinking water by wastewaters, processed fluids, or any water of a quality less than accepted drinking water quality to a degree which would create an actual hazard to the public health through poisoning or through the spread of disease.
13. **Cross-connection** - An arrangement allowing either a direct or indirect connection through which backflow, including backsiphonage, can occur between the drinking water in a public water system and a system containing a source or potential source of contamination, or allowing treated water to be removed from any public water system, used for any purpose or routed through any device or pipes outside the public water system, and returned to the public water system. The term does not include connections to devices totally within the control of one or more public water systems and connections between water mains.
14. **Degree of Hazard** - An evaluation of the potential risk to health and the adverse effect upon the public water supply system.
15. **Double Check Valve Assembly (DCVA)** - An assembly composed of two single, independently acting, soft-seated, spring-loaded check valves including tightly closing shutoff valves located at each end of the assembly and suitable connections for testing the water tightness of each check valve.
16. **Fixture Outlet Protection** - Cross-connection control which isolates all free-flowing fixture outlets (i.e., faucets) from the water distribution system within a facility. Fixture outlet protection prevents backflow contamination of both the facility water system and the public water supply. Examples of fixture outlet protection devices include atmospheric vacuum breakers, hose-bibb vacuum breakers, and pressure vacuum breakers.
17. **Health Hazard** - Any condition, device, or practice in a water system or its operation that creates, or may create, a danger to the health and well-being of its users. The word "severe", as used to qualify "health hazard", means a hazard to the health of the user that could reasonably be expected to result in significant morbidity or death.
18. **Hose-Bibb Vacuum Breaker (HBVB)** - A fixture outlet device which contains a soft-seated, spring-loaded, air inlet valve and is designed to be attached to an outlet having a hose connection thread.
19. **Interchangeable Connection** - An arrangement or device that will allow alternate, but not simultaneous, use of two sources of water.
20. **Internal Protection** - Cross-connection control which isolates all non-outlet, water-use appliances within a facility (e.g., kitchen appliances, air conditioners, boilers, process tanks,

photo developing equipment) from the water distribution system within the facility. Internal protection prevents backflow contamination of both the facility water system and the public water supply. Reduced pressure zone devices and double check valve assemblies are used for internal protection.

21. **Non-Health Hazard** - Any condition, device or practice in a water system or its operation that creates, or may create, an impairment of the quality of the water to a degree which does not create a hazard to the public health, but which does adversely and unreasonably affect the aesthetic qualities of such water for domestic use.
22. **Non-Potable Water** - Water not safe for drinking, personal, culinary, or any other type of domestic use.
23. **Person** - Any individual, partnership, association, company, corporation, municipality, municipal authority, political subdivision or any agency of federal or state government. The term includes the officers, employees and agents of any partnership, association, company, corporation, municipality, municipal authority, political subdivision or any agency of federal or state government.
24. **Pollution** - The presence in water of any foreign substance that tends to degrade its quality so as to constitute a hazard, or to impair the usefulness or quality of the water to a degree which does not create an actual hazard to the public health, but which does adversely and unreasonably affect such waters for domestic use.
25. **Potable Water** - Water which is satisfactory for drinking, personal, culinary, and domestic purposes and meets the requirements of DEP.
26. **Pressure Vacuum Breaker (PVB)** - A fixture outlet device containing an independently operating, soft-seated, spring-loaded check valve and an independently operating, soft-seated, spring-loaded, air inlet valve on the discharge side of the check valve.
27. **Process Fluids** - Any fluid or solution which may be chemically, biologically or otherwise contaminated or polluted in a form or concentration such as would constitute a health, pollutional, or system hazard if introduced into the public or a consumer's water system. This includes, but is not limited to:
  - a. Polluted or contaminated waters;
  - b. Process waters; sanitary quality;
  - c. Cooling waters;
  - d. Contaminated natural waters taken from wells, lakes, streams, or irrigation systems;
  - e. Chemicals in solution or suspension;
  - f. Oils, gases, acids, alkalis, and other liquid or gaseous fluids used in industrial or other processes, or for fire fighting purposes;
  - g. Heating system waters from boilers or heat pumps.
28. **Public Water Supplier** - A person who owns or operates a public water system.

29. **Public Water Supply System** - A system which provides water to the public for human consumption which has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. The term includes any collection, treatment, storage, and distribution facilities under control of the operator of the system and used in connection with the system. The term includes collection or pretreatment storage facilities not under such control, which are used in connection with the system. The term also includes a system which provides water for human consumption via bottling, vending machines, retail sale, or bulk hauling methods.
30. **Reduced Pressure Zone Device (RPZD)** - A device which contains two independently acting, soft-seated, spring-loaded check valves, together with a soft-seated, spring-loaded, diaphragm-activated, pressure differential relief valve located between the two check valves. During normal flow and at the cessation of normal flow, the pressure between these two checks shall be less than the supply pressure. In case of leakage of either check valve, the differential relief valve, shall maintain the pressure between the checks at less than the supply pressure by opening to the atmosphere. The device must include tightly closing shutoff valves located at each end, and each device shall be fitted with properly located test cocks.
31. **Residential Dual Check Valve (RDCV)** - A non-testable backflow prevention device that is used for containment control of residential homes and consists of two independently operating, soft-seated, spring-loaded, consecutive check valves.
32. **Service Connection** - The terminal-end of a service line from the public water supply system. If a meter is installed at the end of the service line, then the service connection means the downstream end of the meter.
33. **System Hazard** - A condition posing an actual or potential threat of damage to the physical properties of the public water system or to the consumer's potable water system.

### **Section 3 Water System**

- 3.1 The water system shall be considered as made up of two parts: the public water supply system and the consumer's water system.
- 3.2 The public water supply system shall consist of the source facilities and the distribution system, and shall include all those facilities of the public water supply system under the control of RAWA up to the point where the consumer's water system begins.
- 3.3. The source shall include all components of the facilities utilized in the production, treatment, storage, and delivery of water to the public distribution system.
- 3.4. The public distribution system shall include the network of conduits used for delivery of water from the source to the consumer's water system.

3.5. The consumer's water system shall include all facilities beyond the service connection, which are utilized in conveying water from the public distribution system to points of use.

#### **Section 4 Cross-Connections Prohibited**

4.1 No water service connection shall be installed or maintained to any premises where actual or potential cross-connections to the public water supply system or consumer's water system may exist, unless such cross-connections are abated or controlled to the satisfaction of RAWA.

4.2 No connection shall be installed or maintained whereby water from an auxiliary water supply may enter a public or consumer's water system unless such auxiliary water supply, as well as the method of connection and use of such supply, has been approved.

#### **Section 5 Surveys and Investigations**

5.1 The consumer's premises shall be open at all times to RAWA, or its authorized representative, for the purposes of surveying for, or investigating, actual or potential cross-connections.

5.2 On request by RAWA, the consumer shall furnish information on water use practices within his premises.

5.3 It shall be the responsibility of the water consumer to conduct periodic surveys of water use practices on his/her premises to determine whether there are actual or potential cross-connections to his/her water system.

#### **Section 6 Where Protection is Required**

6.1 An approved backflow prevention device shall be installed prior to the first branch line leading off each service line to a consumer's water system where, in the judgement of RAWA, an actual or potential hazard to the public water supply system exists.

6.2 An approved backflow prevention device shall be installed on each service line to a consumer's water system where the following conditions exist:

Systems having an auxiliary water supply, unless such auxiliary supply is accepted as an additional source by RAWA and approved by DEP.

Systems where any substance is handled in such a fashion as to create an actual or potential hazard to the public water supply system. These shall include:

Systems having sources or auxiliary systems, which contain process fluids or waters originating from the public water supply system, which are no longer under the sanitary control of the water purveyor.

Systems having internal cross-connections that are not correctable, or intricate plumbing arrangements which make it impractical to determine whether or not cross-connections exist.

Systems where, because of security requirements or restrictions, it is impossible or impractical to make a complete cross-connection survey.

Systems having a repeated history of cross-connections.

6.3 An approved backflow prevention device shall be installed on each service line to a consumer's water system serving, but not necessarily limited to, the following types of facilities unless RAWA determines that no actual or potential hazards to the public water supply system exist: hospitals, mortuaries, clinics, nursing homes; laboratories; piers, docks, waterfront facilities; sewage treatment plants, sewage pumping station or storm water pumping station; food or beverage processing plants; chemical plants; metal plating industries; petroleum processing or storage plants; radioactive material processing plants; or car wash or truck wash.

## **Section 7 Type of Protection Required**

7.1 The type of protection required under Section 6.1, 6.2, and 6.3 of these Resolutions shall depend on the degree of hazard which exists as follows:

An approved air gap separation shall be installed where the public water supply system may be contaminated with substances that are dangerous to public health and could cause a severe health hazard, and where such a device would be technically feasible and/or practical.

An approved air gap separation or an approved reduced pressure zone device shall be installed where the public water supply system may be contaminated with a substance that could cause a system or health hazard.

An approved air gap separation, an approved reduced pressure zone device, or an approved double check valve assembly shall be installed where the public water supply system may be polluted with substances that would be objectionable but not dangerous to health.

## **Section 8 Backflow Prevention Devices**

8.1 Any backflow prevention device required by these Resolutions shall be of a model or construction approved by RAWA and shall comply with the following:

Air gap separation to be approved shall be at least twice the diameter of the supply pipe, measured vertically above the top rim of the receiving vessel, but in no case less than one inch.

A double check valve assembly or a reduced pressure zone device shall be approved by RAWA and shall mean a device that has been manufactured in full conformance with standards established by the American Water Works Association (AWWA) entitled:

ANSI/AWWA C510 Standard for Double Check Valve Backflow-Prevention Assembly.

and

ANSI/AWWA C511 Standard for Reduced-Pressure Principle Backflow-Prevention Assembly

Said AWWA standards are herein adopted by RAWA. Final approval, however, of the reduced pressure zone device and the double check valve assembly shall be evidenced by a certificate of full approval, issued by an approved testing laboratory, certifying full compliance with the said AWWA standards.

8.2 Existing backflow prevention devices approved by RAWA at the time of installation and properly maintained shall, except for inspection and maintenance requirements, be excluded from the requirement of Section 8.1 of these Resolutions provided RAWA is assured that they will satisfactorily protect the public water supply system. Whenever the existing device is moved from the present location, or requires more than minimum maintenance, or when RAWA finds that the maintenance of the device constitutes a hazard to health, the device shall be replaced by a backflow prevention device meeting the requirements of these Resolutions.

### **Section 9 Installation**

9.1 Backflow prevention devices required by these Resolutions shall be installed at a location, and in a manner, approved by RAWA. The device(s) shall be installed by a person properly qualified. Installation of the devices shall be at the expense of the water consumer.

9.2 Backflow prevention devices installed on the service line to a consumer's water system shall be located on the consumer's side of the water meter, as close to the meter as is reasonably practical, and prior to any other connection.

9.3 Pits or vaults shall be water-tight, flood-free, and maintained free from standing water by means of either a sump and pump or a suitable drain. Such a pump or drain shall not connect to a sanitary sewer, nor permit flooding of the pit or vault by reverse flow from its point of discharge. An access ladder and adequate lighting, natural or artificial, shall be provided to permit maintenance, inspection, and testing of the backflow prevention device.

### **Section 10 Inspection and Maintenance**

10.1 It shall be the duty of the consumer at any premises on which backflow prevention devices are required by these Resolutions to have inspections, tests, and overhaul made in accordance with the following schedule, or more often where inspections indicate a need.



a. Air separation shall be inspected at the time of installation, and at least every 12 months thereafter.

b. Double check valve assemblies shall be inspected and tested for tightness at the time of installation, and at least every 12 months thereafter. These devices shall be dismantled, inspected internally, cleaned, and repaired whenever needed, and at least every 30 months.

c. Reduced pressure zone devices shall be inspected and tested for tightness at the time of installation, and at least every 12 months thereafter. These devices shall be dismantled, inspected internally, cleaned, and repaired whenever needed and at least every five years.

d. Pressure vacuum breakers shall be inspected and tested for the capability to prevent backsiphonage at the time of installation and at least every 12 months thereafter. These devices shall be dismantled, inspected internally, cleaned, and repaired whenever needed and at least every 12 months.

10.2 Inspections, tests, and overhaul of backflow prevention devices shall be made at the expense of the water consumer, and shall be performed by a person certified to inspect, test, and overhaul backflow prevention devices.

10.3 Whenever backflow prevention devices required by these Resolutions are found to be defective, they shall be repaired or replaced at the expense of the consumer without delay.

10.4 The water consumer must maintain a complete record of each backflow prevention device from purchase to retirement. These shall include a comprehensive listing that includes a record of all tests, inspections, and repairs. Records of inspections, tests, repairs, and overhaul shall be submitted to RAWA upon request.

10.5 Backflow prevention devices shall not be bypassed, made inoperative, removed, or otherwise made ineffective without specific authorization by RAWA.

10.6 RAWA has adopted, and there is in effect, a Resolution Establishing Large Water Meter Testing and Replacement Program (the "Testing Program Resolution"), which, among other things, establishes an initial and ongoing testing program for large water meters, the installation configuration of large water meter facilities and backflow prevention devices. The provisions of this Resolution are subject in all respects to the provisions of the Testing Program Resolution and shall control if the provisions thereof are inconsistent with the provisions hereof.

## **Section 11 Booster Pumps**

11.1 Where a booster pump has been installed on the service line to, or within, any premises, such a pump shall be equipped with a low pressure cut-off device designed to shutoff the booster pump when the pressure in the service line on the suction side of the pump drops to 10 pounds per square inch gauge or less for a period of 30 seconds or longer.

11.2 It shall be the duty of the water consumer to maintain the low pressure cut-off device in proper working order and to certify to RAWA, at least once a year, that the device is operating properly.

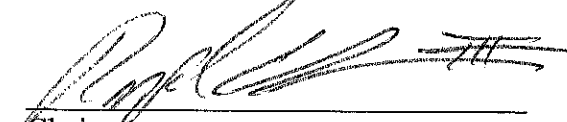
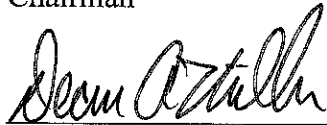
**Section 12 Violations**

12.1 RAWA may deny or discontinue, after issuing reasonable notice, the water service to any premises wherein any backflow prevention device required by these Resolutions is not installed, tested, and maintained in a manner acceptable to RAWA, or if it is found that the backflow prevention device has been removed or by-passed, or if an unprotected cross-connection exists on the premises, or if a low pressure cut-off device required by these Resolutions is not installed and maintained in working order.

12.2 Water service to such premises shall not be restored until the consumer has corrected or eliminated such conditions or defects in conformance with these Resolutions and to the satisfaction of RAWA.

IN WITNESS WHEREOF, the aforesaid Amended and Restated Resolutions have been adopted by majority vote of a quorum of the Board of Reading Area Water Authority at a duly advertised public meeting held January 28, 2010.

READING AREA WATER AUTHORITY

  
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Chairman  
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Asst Secretary