

The Utilities Board  
City of Muscle Shoals  
Water Department  
Cross Connection Control  
Policy Manual



**THE UTILITIES BOARD-WATER DEPT. OF THE CITY OF MUSCLE SHOALS**  
**CROSS CONNECTION CONTROL**  
**POLICY MANUAL**

Updated: September 18, 2014

**BACKFLOW PREVENTION  
AND CROSS-CONNECTION CONTROL  
POLICY OF  
THE UTILITIES BOARD  
OF THE CITY OF MUSCLE SHOALS, ALABAMA**

**I. GENERAL POLICY**

**A. Compliance**

This Backflow Prevention and Cross-Connection Control Policy as adopted by the Utilities Board of the City of Muscle Shoals, Alabama (Board) as a purveyor of potable water in the State of Alabama and is consistent with and meets the requirements of the following:

1. The Federal Safe Drinking Water Act of 1974 (and Amendments) – Public Law 93-523.
2. The U.S. Environmental Protection Agency (EPA) – Cross Connection Control Manual, 2003.
3. The Alabama Department of Environmental Management (ADEM), Division 7, Water Supply Program, Code R. 335-7-9 – Cross Connection Control Requirements, Effective: May 2009.
4. Statutory Authority: Code of Alabama 1975, Section 22-23-33, 22-23-49, 22-22A-5 and 22-22A-6.
5. The Policies, Rules, and Regulations of the Utilities Board of the City of Muscle Shoals, Alabama (latest revision).

**B. Purpose**

The purpose of this policy is:

1. To protect the public potable water supply of the Board from the possibility of contamination or pollution by isolating within the customer's internal distribution system(s) or the customer's private water system(s) such contaminants or pollutants that could backflow into the public water system; and,
2. To promote the elimination or control of existing cross-connections, actual or potential, between the customer's potable water system(s) and non-potable water systems, plumbing fixtures, and industrial piping systems; and,
3. To provide for the maintenance of a continuing program of cross-connection control that will systematically and effectively prevent the contamination or pollution of all potable water systems.

## **C. Responsibility**

### **1. Water Purveyor**

The Board shall be responsible for developing, implementing, and enforcing a backflow and cross-connection control policy consistent with the applicable state and federal regulations for the reasonable protection of the public potable water distribution system from contamination or pollution originating in a customer's water system. The responsibility to ensure a safe water supply begins at the raw water source and includes adequate treatment facilities, storage facilities, distribution networks, and ends at the point of service to the customer's water system. The Board shall determine the degree of hazard or potential hazard to the public potable water system inherent in supplying a customer's water system and shall specify the appropriate means of protection required for the service connection. The location and type of backflow protection devices for each connection to the Board's distribution system shall be approved by the Board.

### **2. Customer**

The customer has the primary responsibility of preventing pollutants and contaminants from entering their potable water system or the public potable water system. The customer's responsibility starts at the point of delivery from the public potable water system at the connection to the Board's meter or isolation valve and, in the case of a dedicated fire service line, includes all of his water system. The customer, at his own expense, shall install, operate, test, and maintain approved backflow prevention assemblies as directed by the Board.

In the event of a known contamination or pollution hazard to the public potable water supply, the customer shall promptly take steps to confine further spread of contamination within the customer's premise and shall immediately notify the Board of the potential hazard.

The customer shall maintain accurate records of tests and repairs made to backflow prevention assemblies and shall maintain such records for a minimum period of five (5) years. The records shall be on forms approved by the Board and shall include the list of materials or replacement parts used. Following any repair, overhaul, re-piping or relocation of an assembly, the customer shall have it tested to insure that it is in good operating condition and will prevent backflow. A certified backflow prevention assembly tester shall make tests, maintenance and repairs of backflow prevention assemblies.

### **3. Certified Backflow Prevention Assembly Testers**

When employed by the customer to test, repair, overhaul, or maintain backflow prevention assemblies, a backflow prevention assembly tester will have the following responsibilities: The tester will be responsible for making competent inspections and for repairing or overhauling backflow prevention assemblies and making reports of such repair to the customer and responsible authorities on forms approved by the Board. The tester shall be familiar with all applicable state and local laws, rules, and regulations, and shall be equipped with and be competent to use all the necessary tools, gauges,

manometers and other equipment necessary to properly test, repair, and maintain backflow prevention assemblies. It will be the tester's responsibility to insure that original manufactured parts are used in the repair of or replacement of parts in a backflow prevention assembly. It will be the tester's further responsibility not to change the design, material or operational characteristics of an assembly during repair or maintenance without prior approval of the Board. A certified tester shall perform the work and be responsible for the competency and accuracy of all tests and reports. A certified tester shall provide a copy of all test and repair reports to the customer and to the Board within ten (10) business days of any completed test or repair work. A certified tester shall maintain such records for a minimum period of five (5) years. All certified testers must obtain certification from an approved training course and employ properly calibrated backflow prevention assembly test equipment.

## II. DEFINITIONS

The following words, terms and phrases, when used in this policy, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

### A. **Auxiliary Water**

Any water on or available to the premises other than the water supplied by the Board's public potable water system. These auxiliary waters may include water from another supplier's public water system; or water from a source such as wells, lakes, or streams; or process fluids; or used water. They may be polluted, contaminated, or objectionable, or constitute a water source or system over which the supplier does not have control.

### B. **Backflow**

Any reversal of flow of water from its intended direction that can potentially cause used water to return to the Board's distribution system. Backflow or reversed flow occurs through a cross connection under the following two conditions:

#### 1. **Back Pressure**

Backflow caused by an increase in the pressure of the private (customer's) system above that of the Board's distribution system.

#### 2. **Back Siphonage**

Backflow caused by a lowering in the pressure of the Board's distribution system below that of the private (customer's) system.

### C. **Backflow Prevention Assembly**

An assembly used to prevent backflow from a customer's system into a public potable water system. The type of assembly used should be based on the degree of hazard, either existing or potential. The types of Backflow Prevention Assemblies used in the Board distribution system are as follows:

#### 1. **Dual Check Valve (DCV)**

Minimum type of protection required; this type is automatically installed for each new residential connection or service connection that is 1 inch in diameter or smaller which does not present a specific contamination or pollution hazard to the system as identified by the Board. This device consists of two internally loaded check valves. DCVs are not testable backflow prevention assemblies.

### **2. Double Check Backflow Assembly (DCBA)**

Level of backflow protection typically required for pollution type hazards and as a minimum protection for any connection larger than 1 inch. DCBAs consist of two internally loaded check valves installed between two resilient-seated gate valves with properly located resilient-seated test cocks.

### **3. Reduced Pressure Backflow Assembly (RPBA)**

Highest degree of backflow protection. Required for contamination or health types of hazards. RPBA consists of two independently acting check valves together with a hydraulically operating, mechanically independent pressure-differential relief valve installed between two resilient-seated gate valves with properly located resilient seated test cocks.

#### **D. Contaminant**

A substance that will impair the quality of the water to a degree that it creates a serious health hazard to the public leading to the poisoning or spread of disease.

#### **E. Cross-Connection**

A connection or potential connection between any part of a potable water system and any other environment containing other substances in a manner that, under any circumstances would allow such substances to enter the potable water system. Other substances may be gases, liquids, or solids, such as chemicals, waste products, steam, water from other sources (potable or non-potable), or any matter that may contaminate, change the color, or add odor to the water.

#### **F. Customer**

The owner or tenant, or the agent of either, or other persons in charge of any premises supplied by or in any manner connected to the Board's potable water system.

#### **G. Degree of Hazard**

A term derived from an evaluation of the potential risk to health and the adverse effect on the potable water system. Hazards evaluated in the Board's potable water system are as follows:

##### **1. Contamination or Health Hazard**

A cross-connection or potential cross-connection involving any foreign substance that could, if introduced into the potable water supply, cause death or illness, spread disease, or have a high probability of causing such effects.

## **2. Pollution Hazard**

A cross-connection or potential cross-connection involving any foreign substance, that if permitted to get into the public water system, will degrade its quality so as to constitute a moderate hazard, or 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 effect such water for domestic use.

## **3. System Hazard**

A condition posing an actual or potential threat of damage to the physical properties of the public water system or a customer's potable water system.

### **H. Detector Assembly**

Low flow bypass water meter and DCV used to indicate water usage through an isolated connection to the potable water system where a line size meter is not typically required. For example, fire protection service lines.

### **I. Industrial - Fluids System**

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 potable customer's water system. This includes, but is not limited to:

- a). Polluted or contaminated waters
- b). Process waters
- c). Used waters originating from the public water system which may have deteriorated in sanitary quality
- d). Cooling waters
- e). Contaminated natural waters taken from wells, lakes, streams, or irrigation systems
- f). Chemicals in solution or suspension
- g). Oils, gases, acids, alkalis, and other liquid and gaseous fluids used in industrial or other processes, or for fire fighting purposes

### **J. Pollutant**

A foreign substance, that if permitted to get into the public water system, will degrade its quality so as to constitute a moderate hazard, or 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 effect such water for domestic use.

### **K. Service Connection**

The terminal end of a service line from the public potable water system. If a meter is installed at the end of the service, then the service connection means the downstream end of the meter.

**L. Service Lines**

The customer's water system downstream of the Board's meter.

**M. Water – Potable**

Water that is safe for human consumption as described by the public health authority having jurisdiction.

**N. Water – Non-Potable**

Water that is not safe for human consumption or that is of questionable quality.

**O. Water – Used**

Any water supplied by the public water system to a customer's water system and is no longer under the control of the supplier.

**III. REQUIREMENTS**

**A. New Service Connections**

Every new connection to the Board's potable water system will have some type of backflow protection installed at the time service is established. Each service connection shall be protected against a backflow incident. The exact type of backflow protection will be determined based on the degree of hazard of a backflow incident from the customer's premises, not the likelihood of a backflow incident occurring.

All applications for new service connections to the public potable water system shall be evaluated by the Board to determine the degree of hazard present and the type of backflow prevention assembly required. The criteria used for evaluation shall be as outlined in Section 6 of this policy. The device(s) required and approved by the Board shall be installed and tested by the customer before service will be granted.

Where adequate plans and specifications are not available for review, and no realistic evaluation of the proposed water uses can be determined, the Board will require the customer to install a backflow prevention assembly that will provide the maximum protection to the public potable water supply.

The Board will install a DCV for any new service connection that is 1 inch in diameter and smaller which does not present a specific contamination or pollution hazard to the system as part of a standard meter set.

**B. Existing Service Connections**

For services existing prior to the implementation of this policy, the Board will perform evaluations and inspection of plans and/or premises to identify potential cross connections/backflows. Once identified, the Board shall inform owners by letter of any corrective action deemed necessary, the method of achieving the correction, and the time allowed for the correction to be made.

Ordinarily, ninety (90) days will be allowed for compliance. However, this time period may be extended or decreased at the discretion of the Board depending upon the degree of hazard involved and the history of the device(s) in question. If, in the judgment of the Board, an imminent contamination hazard exists, water service to the building or premises where a cross connection exists may be terminated unless the hazard is immediately eliminated. The criteria for selection of backflow protection shall be as outlined in Section 6 of this policy.

Any customer who cannot or will not allow Board personnel on the premises for an inspection of the customer's water and piping system shall be required to install the backflow prevention assembly that will provide the maximum protection to the public potable water supply system. Refusal by a customer to allow an inspection or refusal to install the required backflow prevention assembly shall cause the Board to discontinue service for non-compliance.

If it is determined that an existing residential service or service connection that is 1 inch in diameter and smaller which does not present a specific contamination or pollution hazard to the system is not equipped with a DCV, the Board shall at its expense install the appropriate DCV. The Board will also replace any DCV at its expense in conjunction with any necessary meter replacement.

**C. Discontinuance of service**

Under the authority of Alabama Department of Environmental Management Code R. 335-7-9-.05, the Board shall deny or discontinue water service to any customer if a required backflow prevention device is not installed, tested, or properly maintained, or if a cross-connection exists on the premises and in the view of the Board, there is inadequate backflow protection at the service connection. Water service shall not be restored to such premises until the deficiencies have been corrected or eliminated to the satisfaction of the Board.

**IV. INSTALLATION**

**A. General**

All new construction plans and specifications, when required by the state and local building and plumbing code and the Alabama Department of Environmental Management, shall be made available to the Board for review and approval, and to determine the degree of hazard. All backflow prevention assemblies shall be installed in accordance with the Board's standard specifications and the manufacturer's installation instructions. In the absence of applicable provisions in these standards, the most current building and plumbing code requirements shall apply. The installation of a backflow prevention assembly, which is not approved, must be replaced with an approved backflow prevention assembly.

Following installation, all DCBAs and RPBA's are required to be tested by a certified backflow prevention assembly tester within ten days. The test results shall be submitted on an approved Board form. Ownership, testing, and maintenance of the assembly shall be the responsibility of the customer.

**B. Location**

Backflow prevention and detector assemblies, as required by the Board, shall be situated on the customer's premises as close to the service connection as practicable. The Board strongly recommends that all new installations of DCBAs and RPBA's include the installation of strainers located immediately upstream of the backflow device. The installation of strainers may preclude the fouling of backflow devices.

All DCBAs must be installed in drainable vaults wherever below ground installation is necessary, in accordance with the Board's standard specifications. Sump pumps shall not be allowed to attain drainage inside a vault. RPBA's must be installed above grade in a horizontal position and in a location in which no portion of the assembly can become submerged in any substance under any circumstances. Vault and/or below grade installations are prohibited for RPBA's.

**C. Bypass**

When it is not possible to interrupt water service, provisions shall be made for a parallel installation of backflow prevention assemblies. The Board will not accept an unprotected bypass around a backflow preventer when the assembly is in need of testing, repair, or replacement. Facilities requiring DCBAs typically will have a bypass connection installed around the backflow assembly. All bypass connections shall be equipped with a single check valve located inside the vault. An isolation valve also will be installed on all bypass connections and shall remain locked in the "closed" position under normal operating conditions. RPBA's shall not be equipped with a bypass connection unless a completely redundant RPBA system is installed.

**D. Assembly Specification**

The DCBA device shall meet American Water Works Association (AWWA) C510-97 (latest revision) and be approved by the Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California, as well as all local plumbing codes.

The RPBA device shall meet AWWA C511-97 (latest revision) and be approved by the Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California, as well as all local plumbing codes. Approved backflow assemblies shall be manufactured by Ames, Watts, or an approved equal.

**V. TESTING & CERTIFICATION**

**A. General and Administrative**

Testing of backflow prevention assemblies shall be performed by a certified backflow prevention assembly tester at the customer's expense. The Board shall notify each affected water user when it is time for the backflow prevention assembly installed on the service connection to be tested. This written notice shall give the water user thirty (30) days to have the device tested and supply the water user with the necessary form to be completed and resubmitted to the Board.

A second notice shall be sent to each user who does not have his/her backflow prevention device tested as prescribed in the first notice within the thirty (30) day period allowed. The second notice shall give the water user a two-week period to have his/her backflow assembly tested. If appropriate action is not taken within the two-week period, the Board may terminate water service to the affected water user until the subject device is in compliance.

**B. Testing Personnel**

Certified backflow prevention assembly testers shall provide proof of completion of a training course including a minimum of 32 hours as outlined by the AWWA Manual M14, *Recommended Practice for Backflow Prevention and Cross-Connection Control*. The course shall include class room instruction, laboratory (hands-on) experience with various types of backflow prevention assemblies, familiarization with testing equipment from several manufacturers, and the successful completion of a written examination. The course shall be recognized by AWWA or the American Backflow Prevention Association (ABPA).

In addition to the certification course requirements as outlined above, personnel testing backflow devices servicing fire lines and sprinkler systems must be a pre-approved, qualified inspection technician, currently on file with the State Fire Marshal's office.

Test reports will not be accepted from personnel not certified through an approved certification training course or without appropriate qualification.

All certified backflow prevention assembly testers must obtain and employ backflow prevention assembly test equipment, which has been evaluated and/or approved by the Board. All test equipment shall be checked for accuracy annually, at a minimum, and calibrated, if necessary.

**C. Test Frequency**

All DCBAs and RPBA's shall be tested immediately after installation and annually thereafter. DCVs are not testable backflow prevention devices.

**D. Test Procedures**

Test procedures shall be those currently recommended by the Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California, and shall comply with all local plumbing codes. Testing of backflow assemblies on fire lines and sprinkler systems shall also comply with the requirements of NFPA 25, Standards for the Inspection, Testing, and Maintenance of Water Based Fire Protection Systems.

Testing requires an interruption of service usually lasting 5 to 20 minutes. For facilities that require an uninterrupted supply of water, and when it is not possible to provide

water service from two separate meters, provisions shall be made for a parallel installation of backflow prevention assemblies.

**E. Reporting**

A record of all testing and repairs is to be retained by the customer and the certified tester for a period of five (5) years. Copies of the records must be provided to the Board on an approved form within ten business days after the completion of any testing and/or repair work.

Any time that repairs to backflow prevention assemblies are deemed necessary, whether through annual or required testing or routine inspection by the owner or by the Board, the Board shall be notified immediately and the repairs shall be completed within 48 hours, unless approved otherwise by the Board. The tester shall include the list of all repair materials or replacement parts used in the report.

**VI. FACILITIES REQUIRING BACKFLOW PREVENTION**

**A. General**

Approved backflow prevention assemblies shall be installed on all service lines connected to the Board's distribution system.

Some types of facilities or services have been identified by the Board as having a potential for backflow of non-potable water into the public water supply system. Therefore, an approved backflow prevention assembly will be required on all such services according to the degree of hazard present.

**B. Facilities Requiring Double Check Backflow Assemblies**

DCBAs that meet all of the applicable plumbing codes will be required to be installed when the potential backflow consequences would constitute a pollution type hazard and as a minimum requirement for any connection larger than 1 inch in diameter.

The Board will evaluate each facility on its own unique set of circumstances for the type of backflow protection required. The specific facilities requiring DCBAs shall be in accordance with the Board's standard specifications.

**C. Facilities Requiring Reduced Pressure Backflow Assemblies**

RPBAs that meet all applicable plumbing codes will be required to be installed when the potential backflow consequences would constitute a contamination or health hazard due to the introduction of a contaminant into the water system. The Board will evaluate each facility on its own unique set of circumstances for the type of backflow protection required. The specific facilities requiring RPBAs shall be in accordance with the Board's standard specifications.

## **VII. CONNECTIONS**

### **A. General**

No person shall connect or cause to be connected any supply of water not approved by the Alabama Department of Environmental Management to the water system supplied by the Board. Any such connections allowed by the Board must be in conformance with the backflow prevention requirements of this policy. In the event of contamination or pollution of a public or customer potable water system, the customer shall notify the Board immediately in order that appropriate measures may be taken to overcome and eliminate the contamination or pollution.

### **B. Fire Protection Systems**

A detector meter assembly is required on all backflow assemblies that serve fire protection systems. All connections for fire protection systems shall be protected with an approved DCBA with a detector assembly as a minimum requirement. All fire protection systems using toxic or hazardous additives shall be required to install an approved RPBA with a detector assembly.