



Backflow Prevention by Containment & Cross-Connection Control Program

Easton Suburban Water Authority

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Foreword

In accordance with the Federal Safe Drinking Water Act, the Pennsylvania Safe Drinking Water Act, the requirements of the Pennsylvania Department of Environmental Protection, the recommendations of the American Water Works Association, the recommendations of the Pennsylvania Rural Water Association, and the Rules and Regulations of Easton Suburban Water Authority (ESWA), Easton Suburban Water Authority has established a policy for the protection of the public potable water supply system through 'BACKFLOW PREVENTION BY CONTAINMENT' and 'CROSS-CONNECTION CONTROL'

The Policy and Procedures, outlined in this manual along with other applicable codes, rules, and regulations, are designed to provide reasonable protection of Easton Suburban Water Authority's potable water supply system against *contamination* and/or *pollution* resulting from backflow through uncontrolled plumbing connections and/or cross-connections at residential, commercial and industrial customer premises.

This BACKFLOW PREVENTION BY CONTAINMENT and CROSS- CONNECTION CONTROL manual is designed to provide regulatory agencies, municipalities, public health personnel, plumbing inspectors, maintenance personnel and others with information pertaining to backflow prevention and cross connection control, as well as the customers responsibility towards protecting the public potable water supply. The manual incorporates Easton Suburban Water Authority's policies, rules and regulations for implementation and enforcement through the adoption of standard practices and procedures recognized by Easton Suburban Water Authority and the backflow prevention and cross connection control industry, and are in compliance with laws and regulations as well as sound water works practice.

Introduction

Easton Suburban Water Authority has been providing the growing municipalities around the Easton area with safe, reliable quality water for over 50 years. The production and delivery of safe potable water is our greatest priority and is reflected in Easton Suburban Water Authority's "mission". Easton Suburban Water Authority is committed to providing quality water and valued service to our customers at an affordable price. We will insure our efforts by implementing sound business practices, maintain a well trained professional workforce utilizing advance technologies and meeting the needs and choices of our customers.

Today, Easton Suburban Water Authority supplies an average of 9.0 million gallons a day of safe quality water to almost 32,000 customers throughout 9 municipalities in Northampton County. Easton Suburban Water Authority's distribution system services industrial and commercial facilities as well as residential units with water mains ranging in size from 2" to 24".

When producing and distributing safe quality water, precautions must be taken to be certain that the water is not contaminated by other sources. Such contaminations can occur by way of cross-connections. Easton Suburban Water Authority's BACKFLOW PREVENTION BY CONTAINMENT & CROSS-CONNECTION CONTROL PROGRAM is designed to work with customers and prevent possible contamination originating on the customers' premises from entering and degrading the public water distribution system and protecting the public water supply. The responsibility for cross-connection control does not rest solely or mainly with Easton Suburban Water Authority. The customer has a significant and primary legal duty to prevent contamination originating on the customers property from jeopardizing the health of other customers dependent upon the distribution system for safe quality drinking water.

Easton Suburban Water Authority as a purveyor is proud of its accomplishments in providing its customers with safe quality drinking water. However, contamination on the customer's premises thru cross-connection and the subsequent degrading of the water in the public water distribution system is a problem of continuing concern and ever increasing possibility. Easton Suburban Water Authority recognizes its need to expand and reinforce its education and enforcement efforts. A major portion of the BACKFLOW PREVENTION BY CONTAINMENT & CROSS-CONNECTION CONTROL PROGRAM involves the customer's duty to use independent certified and approved professionals to inspect the customers plumbing and to test backflow devices and record all results once said devices are installed.

The rules and regulations pertaining to protecting the health and safety of individuals and the public from cross-connections are addressed in this manual. Easton Suburban Water Authority reserves the right to revise and amend these rules and regulations.

It is Easton Suburban Water Authority's intent to provide information needed to meet our requirements as well as all requirements on the federal, state and local levels. Should you have any questions or comments, please contact Easton Suburban Water Authority at 610-258-7181 or on the web at www.eswater.net.

Definitions

Air Gap Separation - The unobstructed vertical distance through the free atmosphere between the lowest openings 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 (2xD) 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 (1) inch.

Approved - Acceptable by Easton Suburban Water Authority as meeting an applicable specification stated or cited in this regulation, or as suitable for the proposed use.

Auxiliary Water Supply - Any water supply, on or available, to the premises other than the purveyor's approved public potable water supply

Backflow - A flow condition induced by a differential in pressure, which 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.

Backflow Preventer - A device or other means which will prevent the backflow of water or any other substance into the public water supply system.

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 the customer's source to a valve that exceeds the supply system pressure.

Backsiphonage - The backflow of water or a mixture of water and other substances from a plumbing fixture or other customer source, into the public water supply system due to a temporary negative or sub-atmospheric pressure within the public water supply system.

Consumer - The owner or person in control of any premises supplied by or in any manner connected to a public water system.

Customer's Water System - Any water system located on the consumer, customer'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, customer water system.

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.

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.

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.

Degree of Hazard - An evaluation of the potential risk to health and the adverse effect upon the public water supply system.

Double Check Valve Assembly - 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.

Health Hazard - Any condition, device, or practice in a water system or its operation that creates, or may create a danger to the health or well-being of its user. 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.

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.

Non Potable Water - Water not safe for drinking, personal, culinary, or any other type of domestic use.

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 water for domestic use.

Public Water Supplier - A person who owns or operates a public water system.

Public Water Supply System - A system which supplies water to the public for human consumption which has at least fifteen (15) service connections or regularly serves an average of at least twenty five (25) individuals daily at least sixty (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 also includes a system which provides water for human consumption via bottling, vending machines, retail sale, or bulk hauling methods.

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 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.

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.

Water Purveyor - The owner or operator of a public, potable waterworks system.

100 Purpose

The purpose of this program is to:

- 101 Protect public potable water supply served by Easton Suburban Water Authority from the possibility of contamination or pollution by containment within its customers' internal plumbing system. Such contaminants or pollutants which could backflow or be back-siphoned into the public water system.
- 102 Promote elimination or control of existing cross-connections, actual or potential, between Easton Suburban Water Authority customers in premises potable water system and non-potable water systems.
- 103 Provide for maintenance of a continuing cross-connection control program which will effectively prevent the contamination or pollution of Easton Suburban Water Authorities potable water system by cross-connection through the use of proper backflow prevention devices.
- 104 Educate customers of their legal duty and responsibility to operate their internal plumbing in such a manner as not to create or allow actual or potential threats of contamination or pollution to the public water system.

200 Authority

The following documents give Easton Suburban Water Authority the right to create and enforce this program:

- 201 Federal Safe Drinking Water Act of 1974 and the statues of the state of Pennsylvania.
- 202 Easton Suburban Water Authority Rules and Regulations.

300 Responsibility

- 301 Enforcement and inspection for the protection of potable water lies with many agencies. The responsibility for clean and safe water and the execution of the regulations for an effective program requires the full cooperation of the customer, owner, supplier, and health and plumbing agencies. The prime objective is to eliminate the hazards created by cross-connections by preventing any form of pollutant or contamination from entering the customer's potable water supply or that of the public water system.
- 302 The property owner, customer, or user has the primary responsibility of preventing pollution or contamination from entering his or the public potable water supply. Customer

responsibility begins at the Curb Stop shut -off and includes any and all of the water distribution systems on the premises. It is the responsibility of the customer for adequate design, installation, maintenance and operation of the plumbing system within the premises including the use of backflow preventers by complying with all applicable regulations and plumbing codes. Further, the customer at his expense shall install, have tested and maintain approved backflow prevention assemblies as directed by Easton Suburban Water Authority. The customer should be certain that modifications to existing systems do not create or create the potential for cross-connections. Easton Suburban Water Authority recommends it's industrial and commercial customers appoint a water supervisor to be responsible for the operation and maintenance of the customers plumbing system and be knowledgeable of the Easton Suburban Water Authority BACKFLOW PREVENTION BY CONTAINMENT & CROSS-CONNECTION CONTROL PROGRAM. It should be noted that the program does not protect the customer's internal fixtures as to cross-connections within the customers closed system. The customer (user) is responsible for an internal and fixture outlet protection program.

- 303 Easton Suburban Water Authority's responsibility begins at the source and includes its entire public distribution system and ends at the users curb box connection. Easton Suburban Water Authority is required to determine the customers potential degree of hazard to the public water supply system, type of backflow devise required, if any, and require the customer to purchase, install and have tested said backflow devise. Easton Suburban Water Authority is required to terminate water service to any customer who can not meet or refuses to meet the requirements of the BACKFLOW PREVENTION BY CONTAINMENT & CROSS-CONNECTION CONTROL PROGRAM or of any customer who is found to have a cross-connection on their plumbing system which creates or allows for the immediate risk of a health hazard to the public water supply.
- 304 Plumbing inspectors have the responsibility for the enforcement of plumbing codes to Prevent cross-connections within a customer's private water system. The plumbing inspector's responsibility begins at the location of entry on the premises and includes the entire water system on the customer's property. Plumbing inspectors have a responsibility to be knowledgeable of this program and all requirements of Easton Suburban Water Authority.
- 305 Backflow device inspectors / testers are responsible for the testing, documenting, and recording of any backflow devices tested and or inspected. Customers of Easton Suburban Water Authority may use any inspectors / testers who are listed as approved technicians. All approved backflow device inspectors / testers must be certified by the New England Water Works Association (www.newwa.org) or Pa. Rural Water Association (www.prwa.com). Easton Suburban Water Authority reserves the right to refuse the use of any inspector / tester.

400 Easton Suburban Water Authority Program

This section includes the specifics of Easton Suburban Water Authority's 'BACKFLOW PREVENTION BY CONTAINMENT & CROSS-CONNECTION CONTROL PROGRAM' for both new construction and existing facilities.

401 Cross – Connections are prohibited and no water service shall be installed or maintained to any premises where actual or potential cross-connections to the public water distribution system exists unless such actual or potential cross-connections are abated or controlled to the satisfaction of Easton Suburban Water Authority under the provisions of this program.

402 Inspections of facilities will be performed by Easton Suburban Water Authority or Easton Suburban Water Authority accompanied by a surveyor representing the customer. Inspections will be scheduled and performed in the following manner:

- A. Easton Suburban Water Authority will establish a priority system for the inspections of all facilities. Facilities or locations known as or thought to be of high hazard risk (Hazardous Facilities) to the public water distribution system will be inspected first. Facilities or locations known to be or thought to be of moderate risk (Aesthetically Objectionable Facilities) to the public water distribution system inspected second, and the remaining facilities or locations known to be or thought to be a low risk (Non-Hazardous Facilities) to the public water system tested lastly.
- B. Easton Suburban Water Authority will notify the customer, user, when an inspection of their facility is required. Easton Suburban Water Authority inspection request forms will be faxed or mailed to the customer and will be recorded in that customers file. Customers must schedule a date and time for the inspection within (30) thirty days from the date of the notice. Failure to schedule an appointment within thirty days may result in the termination of water to that location or facility. Easton Suburban Water Authority should have open access to all customer facilities (at reasonable times) without prior notice, if Easton Suburban Water Authority believes recent plumbing changes are in violation of this program or a location or facility poses an immediate health threat to the public water supply.
- C. Backflow requirements on new installations should be addressed at the planning stage and should be included on all drawings submitted to Easton Suburban Water Authority for review and or approval. It should be noted that new installations that do not meet or exceed the hazard protection level of the approved backflow device will not receive a meter and water service will not be turned on. In any case, a minimum of a double check valve will be required on all industrial and or commercial accounts.
- D. Inspections of existing locations or facilities will be performed when scheduled by the customer as per the returned inspection request form. Inspections of existing facilities will consist of, but not be limited to, a visual of all plumbing within the facility, a brief narrative as to the nature of the business and any chemicals or materials used at that location or facility, and determine if the facility has a well or any other type of

auxiliary water supply. All information will be documented on the Easton Suburban Water Authority cross-connection inspection form, Photos of internal plumbing and other areas of interest will be taken while at the location or facility. All information gathered will be used to determine the potential degree of hazard and the specific type of backflow protection required at the customers service line.

- E. Easton Suburban Water Authority cross-connection inspection findings will include the potential degree of hazard at that facility, the type of backflow device required, and its location of installation, and any corrective actions or changes needed, to be in compliance with the program. A timetable for the completion of all work will be indicated. The owner, customer, user shall be responsible for all expenses to purchase, install and have tested any backflow device and or any corrective actions required by Easton Suburban Water Authority under the provisions of this program.
- F. In facilities or locations where a visual inspection of the internal plumbing system is impossible or impractical because of security restrictions or other restrictions the facility will be classified as a high hazard risk and will require an approved reduce pressure zone device.

403 Time Allotment for Completion and re-inspection of Corrective Action and Compliance to the Backflow by Containment and Cross-Connection Control Program will be allocated in the following manner:

- A. First time inspections or initial inspections of existing locations or facilities will be afforded a more lenient timetable for completion. Because of the cost of backflow preventers, and costs associated with the installation of the backflow devices, and or costs to meet any corrective changes required by this program, budget planning may be necessary. With that in mind a maximum of (12) twelve months may be extended to the customer, owner, to comply with all requirements of this program. If all work is completed prior to the indicated maximum allotment of time, the customer, owner, should notify Easton Suburban Water Authority as soon as work is completed.
- B. Violations found at a previously inspected facility or location may be given up to sixty (60) days to correct all violations. Violations will be recorded on a cross-connection inspection findings form which will include a completion / re-inspection date, a copy of the cross-connection inspection findings will be mailed to the facility. The facility must correct all indicated violations by the completion / re-inspection date. The time allowed for completion of corrective action may be shorter than the maximum of 60 days dependant on the level of hazard or potential level of hazard found. If a cross-connection which creates an actual or the potential for immediate health risk to the public water supply is discovered, water service to that location will be terminated immediately. Failure to complete all corrective work by the indicated completion / re-inspection date may result in the termination of water service to that location. All completion / re-inspection dates will at the discretion of Easton Suburban Water Authority.

404 Approved Backflow Devices

- A. This program being a program of “containment only” means Easton Suburban Water Authority will protect the public water system from pollutants or contamination originating in or on a private facility or location from entering the Authority’s distribution system. This being said backflow prevention devices addressed in this program will be limited to AIR GAP SEPARATION, REDUCED PRESSURE ZONE DEVICE (RPZD) and DOUBLE CHECK VALVE ASSEMBLIES (DCVA).
- B. Acceptable or approved backflow prevention devices are those which are approved by either the USC FCCCHR (University of Southern California’s Foundation for Cross-Connection Control and Hydraulic Research) or the ASSE (American Society of Sanitary Engineers) and by the AWWA (American Water Works Association). Such backflow devices will bare a label or tag as proof of approval, some devices may have the approval cast into the assembly. A list of Approved devices can be obtained through the above mentioned approval agencies or the PRWA (Pennsylvania Rural Water Association). Any backflow device deemed as “not acceptable” or “not approved” must be removed from existing services and such device can not be installed as a replacement or on new installations.
- C. An approved air gap separation or an approved reduce pressure zone device shall be installed where the public water system may be contaminated with a substance that could cause or creates the potential for a health hazard (hazardous facility).
- D. An approved air gap separation, 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 the health of the public (aesthetically objectionable facility) or (non-hazardous facility)
- E. Installation of all approved backflow prevention devices must be performed by licensed plumbers and must be installed on the service line on the customer’s side of the water meter, as close as reasonably practical and prior to any connections in the plumbing.
- F. Backflow prevention devices may not be by-passed or have a by-pass installed around it unless that facility or location notifies Easton Suburban Water Authority as to its need for continual water for production or for health reasons. If Easton Suburban Water Authority allows a by-pass to be installed around a backflow prevention device the by-pass must have the same level of protection (same type of backflow device) as the device being by-passed.
- G. Backflow prevention devices are required to be tested periodically, but not all devices require the same intervals of time between tests. The time requirements or schedule for testing of backflow prevention devices under this program are as follows:

Air Gap Separations should be tested or inspected every six (6) months.

Reduced Pressure Zone Devices should be tested every six (6) months.

Double Check Valve Assemblies should be tested every twelve (12) months.

Easton Suburban Water Authority may require any device to be tested more frequently, if that location or facility has a history of failed tests or has the potential for a health risk to the public water system. The owner, user, shall be responsible for all expenses incurred for testing and any repairs or corrective work deemed necessary under this program.

- H. It should be noted that existing facilities or locations found without backflow protection during the cross-connection inspection will be required to install the proper approved backflow prevention device. The installation of a backflow prevention device on any service line may cause a change in hydraulics and or pressure within the plumbing system of that facility. Such facilities should be aware of the potential for these changes as well as the possibility of thermal expansion. The owner, user shall be responsible for correcting these situations resulting from the installation of a backflow prevention device.
- I. Fireline services and fire protection systems require specific types of backflow prevention devices.
 - 1. A metered fireline is one with a “Sensus” Fireline Fire Service Meter Assembly which range in size 4” thru 10”, Each meter consists of a high capacity turbo meter (4” thru 10”), a strainer with stainless steel screening, a detector check valve which is used to direct low flows to a SR displacement type meter which has a check valve on the down stream side and a ball valve before it.
 - 2. An unmetered fire protection system requires a Double Check Detector assembly for any facilities wet or dry with a pumper connection.
 - 3. An unmetered fire protection system requires a Reduced Pressure Detector Assembly for any system utilizing booster pumps, building or facilities over three stories high, or the use of anti-freeze or inhibitors of any kind, and any system where an auxiliary water source is available and is connected or can be connected to the fire protection system.

Again it should be noted the addition of fire protection backflow devices to existing fire protection lines may contribute to thermal expansion, and may have an adverse affect on the hydraulics or pressure within the plumbing of the fire protection system. The owner, user shall be responsible for correcting these situations resulting from the installation of a fire protection backflow device.

405 Hydrant use for Temporary Construction

- A. On occasions Easton Suburban Water Authority will permit a hydrant to be used as a temporary water source at construction sites. When a hydrant is used in this manner an

assembly consisting of a valve, meter and a Reduced Pressure Zone Device must be connected to the hydrant. When work for the day is finished the entire assembly must be removed from the hydrant and stored in a secured location until needed again. At no time will a temporary construction meter be used at any location without the protection of a Reduced Pressure Zone Device.

406 Backflow Prevention Device Testing

- A. Backflow Prevention Devices must be inspected, tested, repaired or replaced in accordance with this program. All expenses for the inspection, testing, repairs or replacement of backflow prevention devices will be the owner, customer's responsibility. The owner, customer is also responsible for the scheduling and record keeping of all tests of the backflow prevention devices, and a copy of the test results must be forwarded to Easton Suburban Water Authority without delay. Easton Suburban Water Authority will maintain a copy of all test results for each backflow prevention device tested.
- B. Periodic testing of backflow prevention devices was addressed earlier in this program and that schedule will be strictly enforced. However additional testing of backflow prevention device will be required in the following scenarios:
 - 1. Immediately after installation.
 - 2. Immediately after any repairs.
 - 3. Immediately after being moved or relocated.
- C. The use of approved backflow device inspectors / testers will be the responsibility of the owner, customer. Only approved inspectors / testers will be recognized by Easton Suburban Water Authority and this Backflow Prevention by Containment and Cross-Connection Control Program.
- D. All backflow device inspectors / testers will be required to have their differential pressure gage test kit tested for accuracy and recalibrated if needed annually. Easton Suburban Water Authority may request a copy of any inspector / testers most recent differential gage accuracy test.
- E. Any backflow prevention device found at a moderate or low hazard risk facility that fails a scheduled test must be repaired and retested within three (3) working days of the original test date. All inspectors / testers test reports must be forwarded to the facility owner, and to Easton Suburban Water Authority.
- F. Any backflow prevention device found at a high hazard risk facility or hazardous facility that fails a scheduled test must be repaired immediately and water service may not be restored to that facility until that failed device has been repaired or replaced and is retested and found to be in proper working condition.