

James City Service Authority

Backflow Prevention & Cross Connection Control Program

Program Summary

The James City Service Authority (JCSA) administers a program of surveying, inspection, and testing of all backflow prevention devices and assemblies within the JCSA water distribution systems. This Backflow Prevention and Cross Connection Control Program is ongoing in nature and was devised and implemented with security of the potable water supply and the health of our citizens in mind. Accordingly, this program was created and is administered by the JCSA, in conjunction with the Virginia State Department of Health and the Environmental Protection Agency. This program, and its terms and conditions, are in place to illustrate the requirements for installation of approved backflow devices or assemblies, and the related responsibilities for regular maintenance, inspection and testing. A vital part of this program is the annual inspection and testing of all backflow assemblies by a Virginia State certified tester with test results being forwarded to the JCSA Special Projects Coordinator. The authority for this program comes directly from the JCSA Board of Directors and its Regulations Governing Utility Service, Section 30, Backflow and Cross Connection Control. Since the JCSA follows a containment policy, all backflow devices are located on the private side of the community potable water system. The property owner is responsible for the maintenance, inspection, and testing of the assemblies and/or devices, and to ensure compliance with the JCSA Backflow Prevention and Cross Connection Control Program requirements. It is essential to the betterment of our overall community health that as a community we remain vigilant to possible backflow events and maintain all cross connection control devices.

For questions or comments, contact:

JCSA Utility Operations Division
Special Projects Coordinator
119 Tewing Road
Williamsburg, VA. 23188
757-259-4138

JAMES CITY SERVICE AUTHORITY

BACKFLOW PREVENTION & CROSS CONNECTION CONTROL PROGRAM



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INTRODUCTION

A cross-connection is a physical connection of piping or fixtures between two separate systems. One system would contain potable water and the other nonpotable, through which backflow or backsiphonage could occur into the potable water system. Bypass arrangements, jumper connections, removable sections, and other devices through which backflow could occur are also considered cross connections by the James City Service Authority (JCSA). To better protect the public water system, the JCSA needs to eliminate cross connections and the possibility of backflow.

Under Public Law 99-339, the Safe Drinking Water Act Amendments of 1986 and the adoption of these public statutes by the Virginia Department of Health, all public water systems are required to have a Backflow Prevention and Cross Connection Control Program. Part II, Article 3 of the Virginia Waterworks Regulations states that:

"It is the responsibility of the purveyor to establish and operate a cross-connection control and backflow prevention program consistent with the extent of the system and the type of consumer served. This program shall include at least one designated individual who shall be responsible for the inspection of the waterworks for cross-connection and backflow prevention control. This program shall be carried out in accordance with the International Plumbing Code, Uniform Statewide Building Code and shall be a continuing program."

This means the JCSA must plan and diligently execute a program of cross-connection control. The program will eliminate cross-connections or require the installation and maintenance of a backflow prevention assembly at the service connection whenever a potential hazard exists in the consumer's system.

In compliance with these regulations, the following is the James City Service Authority's program for Backflow Prevention and Cross Connection Control (BF & CCC). The authority for this BF & CCC Program derives from the James City Service Authority's Regulations Governing Utility Services, Section 30, Cross-Connection Control and Backflow Prevention, which can be accessed electronically at www.jamescitycountyva.gov/1375/Regulations-Governing-Utility-Service.

SECTION 1 OVERVIEW

1.1 Purpose

The purpose of this program is to provide guidelines for the protection of the JCSA potable water supply from pollution or contamination by:

- 1) Promoting the elimination or control of any existing cross connections, actual or potential, between customers and the JCSA potable water supply.
- 2) Providing for on-going programs of cross connection control that will systematically and effectively ensure the protection of all relevant JCSA potable water supply infrastructure.
- 3) Supporting the Commonwealth of Virginia's policy to contain potentially contaminated water by isolating, within the customer's internal distribution system, pollutants that could backflow into the JCSA potable water system.

1.2 Cause of Backflow

There are two forms of backflow: backsiphonage and backpressure. Backflow cannot be totally eliminated, as it is normally caused by accident or unexpected circumstances. However, most causes of backflow can be controlled by good design, proper protection and professional maintenance. Given below, are discussions of the two causes of backflow.

A. Backsiphonage is the result of reduced or negative pressure in the water supply pipe. The principal causes of backsiphonage are:

- 1) Water line repair or break, which is at a lower elevation, creates a negative pressure when water in the line flows to the lower point in the system.
- 2) Undersized piping. When water is withdrawn from a pipe at a very high velocity, the pressure in the pipe is reduced. The pressure differential can cause contaminated water to flow into the pipe thru a siphoning effect.
- 3) Reduced pressure in JCSA potable water system infrastructure due to high water withdrawal rate such as fire flow, water main flushing, mainline water system breaks, or peak system use for turf irrigation (by nature, a seasonal event).
- 4) Reduced supply main pressure on suction side of a booster pump (local event).

B. Back Pressure may occur where a potable water system is cross connected to a nonpotable system of piping, and the pressure in the nonpotable system exceeds that of the potable system. The principal causes of back pressure are:

- 1) Booster pump system designed without backflow prevention devices.
- 2) Potable water connections to boilers and other pressure systems without backflow prevention devices.
- 3) Connections with another system that may, at times, have a higher pressure.
- 4) Water stored in tanks or plumbing systems, which due to their higher elevations, would create pressure sufficient to cause backflow if pressure were lowered in the public water system.
- 5) Incorrect new construction, or existing system refit, that unintentionally creates a potential cross connection scenario.

SECTION 2 RESPONSIBILITY

2.1 JCSA

The JCSA has established the Backflow Prevention and Cross Connection Control Program to be consistent with the Virginia State Health Department guidelines and the needs of its customers served. This program includes one dedicated individual, the Special Projects Coordinator, who is responsible for the Backflow Prevention and Cross Connection Control Program. This program is carried out in accordance with the VDH Waterworks Regulations and is a continuing program. The responsibilities of the JCSA, in accordance with Commonwealth of Virginia Department of Health, Waterworks Regulations, are as follows:

The JCSA has established and operates the Backflow Prevention and Cross Connection Control Program to:

- 1) Protect the JCSA potable water distribution system from contamination or pollution due to the backflow of contaminants or pollutants through a water service connection.
- 2) Eliminate or control cross connections, between the customers' potable and nonpotable water system(s), plumbing fixtures and piping systems.
- 3) Provide for the maintenance of a continuing program of cross connection control which systematically and effectively prevents contamination or pollution of the JCSA potable water system.

2.2 Customer

The customer's responsibility for cross connection control and backflow prevention begins at the water meter, where water is delivered from the JCSA potable water system into the customer's water distribution system. The consumer has the responsibility of preventing pollutants and contaminants from entering the JCSA potable water system. The customer, **at their own expense**, shall install, operate, test, and maintain approved backflow assemblies as directed by JCSA. Customers shall maintain accurate records of annual

tests and repairs of backflow prevention devices and shall forward a copy of these records to the JCSA Special Projects Coordinator, 119 Tewing Road, Williamsburg, VA 23188, phone number (757) 259-4138. These records shall be maintained on forms provided by the JCSA Special Projects Coordinator and can be downloaded at www.jamescitycountyva.gov/632/Backflow-Cross-Connection-Control. In the event of accidental pollution or contamination of the JCSA potable water system, due to backflow on or from the customer's premises, the owner shall promptly take steps to confine further spread of pollution or contamination within their premises. They will immediately notify the JCSA, James City Dispatch, or 911 of the hazardous condition.

2.3 Virginia Department of Health

The VDH is responsible for approving the Cross Connection/Backflow Prevention Program, providing technical assistance, clarification of regulations, and assisting with unique situations.

2.4 Backflow Prevention Device Installation and Testing

The installer's responsibility is to make proper installation of approved backflow prevention devices, in accordance with the manufacturer's installation instructions, the Uniform Statewide Building Code, and any additional instructions offered by JCSA. Approved backflow prevention devices and assemblies are those that meet AWWA standards, and are approved by ASSE and the USC-FCCC (University of Southern California Foundation for Cross Connection Control and Hydraulic Research). Flow orientation, access, and installation of backflow preventers shall be provided in accordance with USC-FCCC guidelines and as specified by the installation instructions of the approved manufacturer. Thermal expansion and/or water hammer downstream of the assembly can cause excessive pressure. To avoid possible damage to the system and assembly, the installer will use water hammer arresters, surge protectors, relief valves and expansion tanks as appropriate. Backflows must not be installed in locations subject to flooding such as underground vaults, with exception of DCVA's that were installed prior to October 1, 2008. Outdoor enclosures for backflow preventers shall comply with ASSE 1060.

The installer shall test the device / assembly to ensure they are in proper working order. All testers, performing backflow assembly testing for new installations, annual testing of existing assemblies, or repaired assembly testing, shall furnish the test results along with the information listed below to the Special Projects Coordinator. This will be accomplished using the approved JCSA test sheet:

- 1) Address where device is located;
- 2) Owner address and telephone number;
- 3) Description of usage, location and size;
- 4) Date of installation;
- 5) Type of device;
- 6) Manufacturer;
- 7) Model number;
- 8) Device tester name, company, cert number, address, and a current calibration date for testing equipment (testing gauges must be calibrated annually).

Note - All of the above referenced data fields can be found of the official JCSA Backflow test form which is available online for download at www.jamescitycountyva.gov/632/Backflow-Cross-Connection-Control.

The required testing information shall be sent to:

James City Service Authority
ATTN: Special Projects Coordinator
119 Tewning Road
Williamsburg, VA 23188

All commercially sited reduced pressure principle backflow preventers (RP), double check valve assemblies (DCVA) or pressure vacuum breakers (PVB) shall be tested immediately after installation and annually thereafter, beginning one year from the date of installation by a Commonwealth of Virginia certified backflow prevention device technician.

SECTION 3 INSPECTIONS AND RECORD KEEPING

3.1 Frequency

All commercially sited and installed Reduced Principle (RP), Double Check Valve Assembly (DCVA), and Pressure Vacuum Breaker (PVB) backflow prevention devices will be testable and shall have a detailed annual inspection performed by a Commonwealth of Virginia certified backflow device tester at the customer's expense. Annual mailings by the JCSA will be used to notify commercial and industrial consumers of when their annual inspections and tests are to be performed. The absence of an annual reminder letter does not void the requirement of the annual inspection required by the JCSA Backflow Prevention and Cross Connection Control Program.

The results of the inspection shall be forwarded to:

James City Service Authority
ATTN: Special Projects Coordinator
119 Tewning Road
Williamsburg, VA 23188

The Cross Connection Control Manager shall maintain records (electronic or written) of all backflow preventer devices and subsequent inspection reports, for no less than 10 years. These records shall be located within the Office of the JCSA Operations Administrator.

3.2 Proposed Construction

All new construction plans and specifications for industrial and commercial facilities shall be reviewed by the James City County Codes Compliance office to determine the likelihood of a potential cross connection hazard. Backflow prevention requirements, in accordance with this policy will be made at that time.

3.3 New and Existing Facilities

In order to determine the degree of potential hazard to the JCSA potable water supply, a survey shall be made of all existing customers' water systems. This survey need not be a detailed inspection of the location and disposition of the water lines. The survey can be confined to establishing the water users on the premises, the existence of cross connections, and the availability of auxiliary or used water supplies and will normally be performed by the JCSA Special Projects Coordinator or designee. Assessments may not necessarily require an on-site inspection. On-site inspections, interviews, or questionnaires may be conducted for new and/or existing facilities. Should any devices or plumbing changes be necessary, a follow-up inspection will be made at an agreed upon date.

SECTION 4 CROSS CONNECTION HAZARD AND REQUIRED PROTECTION

4.1 Containment Policy, Service Line Protection, Special Conditions

Effective October 1, 2008 all new commercial facilities being constructed within the JCSA service area will be required to install an approved service line connected Reduced Pressure Principle (RP) backflow prevention assembly at each domestic water service connection. Commercial buildings undergoing refurbishments and/or renovations that require permitting and approval shall also be required to install a service line protection assembly as directed by this section. Approved backflow prevention assemblies are those that meet AWWA standards, and are approved by ASSE and the USC-FCCC (University of Southern California Foundation for Cross Connection Control and Hydraulic Research). When the backflow prevention device cannot be installed at the service connection, the device shall be located downstream of the service connection but *shall be prior* to any unprotected takeoff. This exception is subject to approval by the JCSA.

4.2 Existing Facilities

Existing facilities are those that were constructed prior to October 1, 2008. An approved backflow prevention assembly of the type designated below shall be installed on each water service connection to the following types of facilities. This list is presented as a reference and shall not be considered complete.

Abbreviations used are as follows:

AG	Air Gap
RP	Reduced Pressure Principle Backflow Preventer
DCVA	Double Check Valve Assembly
PVB	Pressure Vacuum Breaker
AVB	Atmospheric Vacuum Breaker
ASSE	American Society of Sanitary Engineering
AWWA	American Water Works Association
VDH	Virginia Department of Health
USC-FCCC	University of Southern California Foundation for Cross Connection Control & Hydraulic Research

TYPE OF FACILITY**MINIMUM TYPE OF PROTECTION**

Breweries, Distilleries, Bottling Plants	RP
Car Wash with recycling system and/or Wax Educator	RP
Chemical Plants	RP
Dentist Office	RP
Fertilizer Plants	RP
Film Laboratory or Processing Plant	RP
Food or Beverage Plant	RP
Hospitals, Clinics, and all Medical Buildings	RP
Irrigation Systems (if chemical additives are used, an RP must be used)	PVB / RP
Laboratories	RP
Laundries & Dry Cleaning Plants	RP
Machine Tool Plants (Health or System Hazard)	RP
Metal Processing Plant (Health or System Hazard)	RP
Metal Processing Plant	RP
Mortuaries	RP
Nursing Homes	RP
Packing Houses or Rendering Plants	RP
Paper Products Plant	RP
Pesticides (Exterminating Companies)	RP
Petroleum Processing Plant	RP
Petroleum Storage Yard (Health or System Hazard)	RP
Pharmaceutical or Cosmetic Plant	RP
Piers, Docks, or Waterfront Facilities	RP
Power Plants	RP
Radioactive Material Plants	RP
Reclaimed Water Site	AG / RP
Restaurants and Food Service Establishments	RP
Sand and Gravel Plants (If high hazard exist an RP must be used)	RP
Schools with Laboratories	AVB
Swimming Pools with Piped Fill Line	AG at pool
Swimming Pool Treatment Plant uptake	RP
Sewage Treatment Plants	RP
Sewage Pumping Stations	AG / RP
Tall Buildings over 3 stories (If high hazard exist an RP must be used)	RP
Veterinary Establishments	RP
Water Closets	AG

In addition to the types of facilities listed above, an approved backflow prevention device of the type designated shall be installed on each domestic water service connection to any premises containing the following real or potential hazards.

MINIMUM TYPE OF PROTECTION

Premises having an auxiliary water system connected to public water systems (booster pumps qualify).	RP
Premises having a water storage tank, reservoir pond, or similar appurtenance.	RP
Premises having a steam boiler, cooling system, or hot water heating system where chemical water conditions are used.	RP
Premises having submerged inlets to equipment.	RP
Premises having self-draining yard hydrants, fountains, hose boxes or similar devices presenting a health or system hazard (i.e. chemical storage plants, tank farms, bulk storage yards).	RP
Premises having self-draining yard hydrants, fountains, hose boxes or similar devices presenting a pollution hazard (i.e. parks, play fields, cemeteries).	RP
Premises where, because of security requirements or other prohibitions or restrictions, it is impossible or impractical to make a complete cross connection survey.	RP
Others as specified by the James City Service Authority.	RP

Note: When an existing backflow assembly is to be relocated or fails and replacement becomes necessary, customers shall replace the existing device with an approved RP assembly, to meet the current backflow prevention requirements of the JCSA. Proper installation guidelines shall be adhered to and an existing backflow assembly should not be replaced by a RP assembly if the installation would not meet USC-FCCC and the approved manufacturer's installation instructions (example, a DCVA in a vault or pit should not be replaced by a RP assembly installed inappropriately below grade). See section 2.4 for additional installation requirements.

Note: Fire suppression systems being retrofitted with an RP assembly will generally reduce the available fire flow. Customers must ensure that a complete and thorough hydraulic and engineering analysis is performed to ensure proper system performance prior to the exchange and/or replacement of any fire sprinkler or fire suppression system backflow device. Any retrofitted fire sprinkler or fire suppression system will require recertification to verify adequate capacity and/or code compliance.

4.3 Commercial Fire Sprinkler Systems

Fire Protection systems, because of their varying degree of hazard, must be separated from the JCSA potable water supply by a backflow prevention device. Because of this necessity, the JCSA shall be the approving authority for the type and installation of the backflow device. Some hazards relating to fire systems are:

1. The growth of offensive microorganisms that can cause taste and odor problems.
2. The leaching of heavy metals from pipes and fittings such as zinc, cadmium, iron, or lead into water that stands in pipelines for long periods of time.
3. The additions of corrosion inhibitors or antifreeze compounds to protect the piping systems.
4. Dry systems containing compressed air.
5. A loss of pressure (backsiphonage) on the public water supply main or an increase in pressure (backpressure) on the consumer's system which would allow water from these systems to enter the JCSA potable water supply.

If a backflow event occurs from these systems, the hazard could vary from a non-health to a high health hazard.

TYPE OF BACKFLOW PROTECTION REQUIRED – COMMERCIAL FIRE SPRINKLER SYSTEMS

Effective October 1, 2008 a properly installed Reduced Pressure Principle (RP) backflow preventer is required for all commercial fire sprinkler systems.

Existing systems (installed prior to October 1, 2008) that have a high hazard, such as the addition of nontoxic antifreeze or a connection to the JCSA potable water system from a non-JCSA auxiliary water supply, are also required to have a properly installed Reduced Pressure Principle (RP) backflow preventer. If a existing system fire sprinkler system does not have any additives, and no chance for a non-JCSA auxiliary water supply to be connected to the JCSA potable water system exist, then the system may continue to utilize a previously installed Double Check Valve Assembly (DCVA).

Note: When an existing backflow assembly is to be relocated or fails and replacement becomes necessary, customers should replace any existing device or assembly that is not currently a RP assembly with an approved RP assembly. This would be done in order to meet the current backflow prevention requirements of the JCSA. Proper installation guidelines shall be adhered to and an existing backflow assembly shall not be replaced by a RP assembly if the installation would not meet USC-FCCC and the approved manufacturer's installation instructions (example, a DCVA in a vault or pit should not be replaced by a RP assembly installed inappropriately below grade). See section 2.4 for additional installation requirements.

Note: Fire suppression systems being retrofitted with an RP assembly will generally reduce the available fire flow. Customers must consult a fire protection engineer to ensure that a complete and thorough engineering analysis and hydraulic recalculation is performed to ensure proper system performance prior to the installation, exchange and/or replacement of any fire sprinkler or fire suppression system backflow device. Any retrofitted fire sprinkler or fire suppression system will require recertification to verify adequate capacity and/or code compliance.

Note: Through meetings and discussions with the JCC Fire Marshall's Office, it was determined that when they connect to a Fire Department Connection (FDC) with a fire pumper truck, it is the normal routine to only use JCSA potable water. A flushing/disinfection program has also been implemented for use in fire pumper trucks in the event that a non-potable water source is introduced to the pumper trucks. Therefore, for definition, connections of this type will not be considered to be a non-JCSA auxiliary water source.

In addition, the following conditions and circumstances shall also be adhered to:

- 1) Where non-JCSA systems contain chemical additives or antifreeze, the JCSA potable water system shall be protected by a RP backflow preventer. If chemical additives or antifreeze are added to only a portion of the automatic fire sprinkler or standpipe system, the RP backflow preventer shall be located so as to isolate that portion of the system. At a minimum, a DCVA should be installed on the remaining portion of the sprinkler system that contains no additives. This applies only to existing systems, as any system installed after October 1, 2008 will require a properly installed RP assembly to protect the entire system. All antifreeze additives utilized in any system, new or existing, must be nontoxic and meet the requirements of the National Fire Protection Association if the fire protection system is connected to the JCSA potable water supply (see NFPA-13 for more information on chemical additives). JCSA does not allow any toxic chemicals such as ethylene glycol (automotive antifreeze) to be connected to the JCSA potable water supply.
- 2) All backflow assemblies shall be an approved assembly and shall be tested and inspected annually by a State of Virginia certified tester. Approved backflow prevention assemblies are those that meet AWWA standards, and are approved by ASSE and the USC-FCCC (University of Southern California Foundation for Cross Connection Control and Hydraulic Research). Results of the test shall be sent to:

James City Service Authority
ATTN: Special Projects Coordinator
119 Tewning Road
Williamsburg, VA 23188
- 3) Fire protection systems shall not be operated in a manner other than for which the manufacturer originally designed it. (Examples include but are not limited to: operating a dry pipe system inappropriately as a wet system or adding antifreeze to a wet system designed to operate without added chemicals).

4.4 Irrigation Systems

Irrigation systems include but are not limited to agricultural, residential, and commercial applications. The Virginia Department of Health classifies lawn sprinkler systems and irrigation systems as a high hazard for several reasons. Sprinklers, bubbler outlets, emitters, and other equipment are exposed to substances such as fertilizers, fecal material from pets or other animals, pesticides, and other chemical and biological contaminants. Sprinklers may remain submerged under water after use or storms, and can also have various design and operational configurations. They may be subject to various onsite conditions such as additional water supplies, chemical injection, booster pumps, and elevation changes. All of these conditions must be considered when determining backflow protection. Some hazards relating to irrigation systems are:

- 1) Fertilizers: Ammonia salts, ammonia gas, phosphates, potassium salts.
- 2) Herbicides: 2,4-D, dinitrophenol, 2,4,5-T, T-pentachlorophenol, sodium chlorate, borax, sodium arsenate, methyl bromide.
- 3) Pesticides: TDE, BHC, lindane, TEPP, parathion, malathion, nicotine, MH, and others.
- 4) Fecal matter: Animal (domestic and non-domestic).

TYPE OF PROTECTION REQUIRED – IRRIGATION SYSTEMS

For those irrigation systems connected to the JCSA potable water system, the appropriate protection is a Reduced Pressure Principle (RP) backflow prevention assembly. A Pressure Vacuum Breaker (PVB) may be used for service protection if the JCSA potable water service is the sole source of supply to the premises or property, if it is used strictly for irrigation, and there is no means or potential for backpressure (IE: PVB's protect against backsiphonage only). Any irrigation system that has a means to introduce chemicals into the JCSA potable water system shall always be protected against backflow by a RP backflow preventer.

All irrigation systems shall be installed and tested in accordance with Section 2.4 of this Backflow and Cross Connection Control Program. A copy of the JCSA Backflow Assembly Test Report and a list of certified testers (not all inclusive of certified testers in the tidewater region) can be found at the end of this document. Customers shall inquire of the proper State approved backflow inspection credentials of these testers, as certifications are subject to suspension and expiration. The results of the test shall be sent to:

James City Service Authority
ATTN: Special Projects Coordinator
119 Tewning Road
Williamsburg, VA 23188

4.5 Other Cross Connection Hazards

- 1) Fixture Inlets or Valve Outlets – with hose attachments, which may constitute a cross connection, shall be protected by the proper approved vacuum breaker (AVB, HBVB, etc.) installed at least 6 inches above the highest point of usage and located in the discharge side of the last valve. Fixtures with integral vacuum breaker manufactured as a unit may be installed in accordance with their approved requirements.
- 2) Air Conditioning Cooling Towers – Potable water inlet shall have an air gap separation of twice the inside diameter of the inlet line or a minimum of two inches above the flood rim.
- 3) Aspirators and Ejectors – Shall have an AVB or PVB, depending upon the degree of Hazard, on the faucet from which these devices are attached or operated.
- 4) Booster Pumps – All booster pumps shall be provided with a low suction pressure cut-off in accordance with 12 VAC 5-590-610D and 12 VAC 5-590-1050A3, unless other acceptable provisions are made to prevent the creation of low or negative pressures in the piping system.
- 5) Private Wells or Irrigation Wells – Shall not be interconnected with the JCSA potable water system.
- 6) Portable Spray and Cleaning Equipment – Any portable pressure spray or cleaning units that have the capability of connecting to any potable water system, and do not have a built-in approved air gap, shall be fitted with an RP or DCVA depending upon the degree of health hazard. Under no circumstances shall a hose connected to a domestic line be utilized without having at least the minimal protection provided by a functional hose bibb vacuum breaker.
- 7) Miscellaneous Use of Water from Fire Hydrants – The operation of a fire hydrant by anyone other than those authorized by the JCSA is prohibited. The JCSA may permit the use of water from a fire hydrant for construction or other purposes provided the applicant properly applies for, and adheres to backflow prevention requirements on hydrant permits. See JCSA regulations section 21 for more information on hydrant meter usage requirements. The applicant must apply for, and adhere to the backflow requirements of the permit.
- 8) Irrigation Systems – All irrigation systems must be separated from the JCSA potable water supply by a backflow prevention assembly. Due to their high health hazard nature, they must have either a properly installed Pressure Vacuum Break device, correctly installed 12" above the highest system water outlet, or a properly installed Reduced Pressure device (RP) located between system and the JCSA potable supply. AVB's hose bib connections, and Dual Check devices are unacceptable for use in this situation. This is a high health risk, private water system, and must be adequately/appropriately protected.

Note: any device, equipment, or situation not covered by this cross connection policy, which may constitute a potential health hazard, will be examined for appropriate disposition by the JCSA.

SECTION 5 TESTING OF BACKFLOW PREVENTERS

At any premises where reduced pressure backflow prevention assemblies, double check valve assemblies, and pressure vacuum breakers are installed, it is the responsibility of the user to have thorough inspections and operational tests made once a year, or more often in those instances where it is deemed necessary. These inspections shall be at the expense of the consumer and be performed by a manufacturer's representative or by a Commonwealth of Virginia certified backflow tester. The JCSA will send an annual notification to the customer when tests are required and supply the necessary forms. The lack of a notification letter will not void the need to have the annual test and inspection performed as required. Each annual test and inspection date shall not exceed more than 12 months from the date of installation or previous test date. The forms can also be found at www.jamescitycountyva.gov/632/Backflow-Cross-Connection-Control and shall be completed and returned to the JCSA as required.

SECTION 6 PENALTIES FOR NON COMPLIANCE

Any person who is found to be in violation of JCSA Utility Regulations shall be guilty of a misdemeanor, and on conviction thereof, shall be fined in an amount not exceeding one thousand dollars (\$1,000) or sentenced to thirty (30) days in jail, either or both at the discretion of the court for each violation. Each day in which any such violation shall continue shall be deemed a separate offense. Additional violation types and associated fines can be found in the JCSA Regulations Governing Utility Service at www.jamescitycountyva.gov/1375/Regulations-Governing-Utility-Service.

SECTION 7 APPENDIXES OF BACKFLOW TERMS AND REFERENCES

Terms and references utilized in this document by the JCSA for the purpose of defining the scope and nature of backflow prevention were derived from: The American Waterworks Association text, *Recommended Practice for Backflow Prevention and Cross-Connection Control, Manual of Water Supply Practices, M-14, 3rd Edition*; the 2006 International Plumbing Code; the University of Florida TREEO Center text, *Backflow Prevention Theory and Practice Manual, 2nd edition*; and the University of Southern California text, *Manual of Cross-Connection Control, 9th edition*. (All updated or newer editions of these stated reference materials will supersede and replace the editions previously listed). All material meets with EPA and the Commonwealth of Virginia Department of Health requirements.

The definitions listed below supersede all other terms and/or definitions to be found in JCSA literature. Those interested in further research can access the AWWA website at <http://www.awwa.org/>, the Environmental Protection Agency's website at <http://www.epa.gov/dwsixyearreview/drinking-water-distribution-systems> to access and download their cross-connection control manual, or the Commonwealth of Virginia Department of Health's Office of Drinking Water homepage at <http://www.vdh.virginia.gov/odw/>.

AIR-GAP SEPARATION (AG): The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet conveying water to a tank, plumbing fixture, receptor, or other assembly and the flood level rim of the receptacle. An approved air-gap separation shall be a distance of at least two (2) times the diameter of the supply pipe measured vertically above the top rim of the vessel – with a minimum distance of one (1) inch, using whichever measurement is greater.

APPROVED: Accepted as meeting the applicable specification of the James City Service Authority and approved by the Commonwealth of Virginia Waterworks Regulations, Uniform Statewide Building Code, and the International Plumbing Code.

ATMOSPHERIC VACUUM BREAKER (AVB): An approved device consisting of a check valve and an air inlet to relieve a vacuum. It shall effectively shut off the reverse flow of water when a negative pressure exists on the supply side of the device. (Note* The JCSA does not approve of the use of AVB's on irrigation systems under any circumstances.)

AUXILIARY WATER SUPPLY: Any water supply on or available to the premises other than the purveyor's approved public potable water supply. These auxiliary waters may include water from a private nonpotable water supply or any natural source(s) such as a well, spring, river, stream, harbor, etc., or "used waters" or "industrial fluids". These waters may be contaminated or they may be objectionable, and constitute an unacceptable water source over which the water purveyor does not have sanitary control.

BACKFLOW: The undesirable reversal of flow of water or other liquids, mixtures, or substances under pressure into the distribution pipes of a potable water supply system, as the result of a cross-connection, from any source or sources other than its intended source.

BACKFLOW PREVENTION DEVICE: A backflow prevention device shall mean any effective device, method, or construction used to prevent backflow into a potable water system. The type of device used should depend on the degree of hazard, either existing or potential.

BACKFLOW PREVENTION ASSEMBLY/DEVICE – APPROVED: The term "approved backflow prevention assembly or device" are those that meet AWWA standards, and are approved by ASSE and the USC-FCCC (University of Southern California Foundation for Cross Connection Control and Hydraulic Research). NOTE: USC approval is specific to orientation, horizontal or vertical, device model number and size. Approvals are continuously verified and can be rescinded.

BACKSIPHONAGE: The backflow of a fluid or other liquids, mixtures, or substances into the distributing pipes of a potable water supply system by negative or reduced pressure from any source other than its intended source.

BACKPRESSURE: Any elevation of pressure in the downstream piping system (by pump, elevation of piping, or steam and/or air pressure) above the supply pressure at the point of consideration which may cause or tend to cause, reversal of the normal flow.

CROSS CONNECTION CONTROL MANAGER: The James City Service Authority Special Projects Coordinator or as designated by the General Manager, JCSA.

CONTAMINATION: An impairment of the quality of the potable water by the introduction of any solid, liquid, or gaseous compounds or mixtures to a degree which would create an imminent danger to the public health, degrade the water quality and create a health hazard.

CROSS-CONNECTION: Any physical or potential connection or arrangement of piping or fixtures between two otherwise separate piping systems, one of which contains potable water, and the other non-potable water or industrial fluids of questionable safety, through which, or because of which, backflow or backsiphonage may occur into the potable water system. A water service connection between a public potable water distribution system and a customer's water distribution system, which is cross-connected to a contaminated fixture, industrial fluid system or with potentially contaminated supply or auxiliary water system, constitutes one type of cross connection. Other substances may be gases, liquids, or solids, such as chemicals, wastes products, steam, water from sources (potable or nonpotable), or any matter that may change the color or add odor to the water.

CROSS-CONNECTION – CONTROLLED: A connection between a potable water system and a nonpotable water system with an approved backflow prevention assembly properly installed and maintained so that it will continuously afford the protection commensurate with the degree of hazard.

DOUBLE CHECK VALVE ASSEMBLY (DCVA): An assembly composed of two single, internally loaded, independently acting, check valves, installed as a unit between two tightly closing resilient seated shutoff valves and fittings with properly located resilient seated test cocks. The check valve shall permit no leakage in a direction reverse to the normal flow. This assembly shall only be used to protect against a non-health hazard (that is, a pollutant).

HAZARD-DEGREE OF: The term "degree of hazard" is a qualification of what potential and actual harm may result from cross-connection within a water using facility. Establishing the degree of hazard is directly related to the type and toxicity of contaminants that could feasibly enter the public water supply system and is determined by the James City Service Authority Special Projects Coordinator.

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

HAZARD –PLUMBING. A plumbing-type cross connection in a consumer's potable water system that has not been properly protected by an approved air gap or an approved backflow prevention assembly.

HAZARD–NON-SYSTEM. A cross connection or potential cross connection involving any substance that generally would not be a health hazard but would constitute a nuisance or be aesthetically objectionable, if introduced into the potable water supply.

HAZARD-SYSTEM. An actual or potential threat of severe damage to the physical properties of the public potable water system or the consumer's potable water system or of a pollution or contamination that would have a protracted effect on the quality of the potable water in the system.

INDUSTRIAL FLUIDS SYSTEM: Any system containing a fluid or solution that may be biologically, chemically, or otherwise contaminated or polluted in a form or concentration, such as would constitute a health, system, pollution, or plumbing hazard, if introduced into an approved water supply. This may include, but not limited to, polluted or contaminated waters; all types of process waters and used waters originating from the public water system that may have deteriorated in sanitary quality; chemicals in fluid form; plating acids and alkalis; circulating cooling towers connected to an open cooling tower; and/or cooling towers that are chemically or biologically treated or stabilized with toxic substances; contaminated

natural waters; such as wells, springs, streams, rivers, bays, harbors, irrigation systems, and so forth; oils, gases, glycerin, paraffin, caustic or acid solutions, and other liquid and gaseous solutions used in industrial or other purposes for fire-fighting purposes

REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY (RP): The approved reduced pressure principle backflow prevention assembly consists of two independently acting, approved check valves, together with a hydraulically operating pressure differential relief valve located between the two check valves, and below the first valve. The first check valve reduces the supply pressure a predetermined amount so that during normal flow and at cessation of normal flow the pressure between the check valves shall be less than the supply 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 check valves less than the supply pressure. The unit shall include tightly closed shut-off valves located at each end of the device, and each device shall be fitted with properly located test clocks.

PRESSURE VACUUM BREAKER ASSEMBLY (PVB): A pressure vacuum breaker is similar to an atmospheric vacuum breaker except that the checking unit "poppet valve" is activated by a spring. This type of vacuum breaker does not require a negative pressure to react and can be used on a pressure side of a valve.

WATER PURVEYOR: The James City Service Authority. As used herein the terms water purveyor and James City Service Authority may be used synonymously.

WATER SYSTEM – CUSTOMER’S: The term "customer's water system" shall include any water system located on the customer's premises, whether supplied by a public potable water system or an auxiliary water supply. The system or systems may be either a potable water system or an industrial piping system.

WATER-USED: Any water supplied by the James City Service Authority water system to a customer's water system after it has passed through the point of delivery and is no longer under the sanitary control of the Service Authority.

JCSA offers the following list and information to our customers only as a convenient reference list and it is not all inclusive of certified testers in the local region.

The JCSA highly recommends that whenever customers prepare to hire someone to test their devices they should inquire of the proper State approved backflow inspection credentials of those being considered, because certifications are subject to suspension and expiration. Customers may also check the current status of the contractor's license at the Commonwealth's Department of Professional and Occupational website (click on "License Lookup" at www.dpor.virginia.gov) or by calling (804) 367-8511. The JCSA does not endorse, guarantee or warrant any work performed by contractors listed here. All interactions between customers and contractors are private business transactions between these two entities.

Virginia licensed backflow testers, with the credentials for testing backflow devices, and interested in being listed here should contact the Special Projects Coordinator for the JCSA, at (757) 259-4138.

List for Testing Backflow Preventers

JCSA offers the following list and information to our customers only as a convenient reference list and may not be all inclusive of DPOR certified testers in the local region.

The JCSA does not endorse, guarantee or warrant any work performed by contractors listed here. All interactions between customers and contractors are private business transactions between these two entities.

PLEASE SEE ADDITIONAL INFORMATION ON PAGE 2

<u>NAME</u>	<u>PHONE</u>	<u>ADDRESS</u>	<u>CITY & STATE</u>	<u>ZIP</u>
Free Backflow Inspection	645-5609	3450 Westham Lane	Toano, Virginia	23168
Kirby's Irrigation & Landscape	342-0266	P.O. Box 575	Lightfoot, Virginia	23090
Williamsburg Irrigation	291-9892	1221 Colony Trail	Lanexa, Virginia	23089
World Wynne Plumbing, LLC	358-8867	2915 Snuggles Court	Toano, Virginia	23168
Colonial Backflow Preventers, Inc	603-1244	115 Colonial Ave.	Williamsburg, Virginia	23185
Cookes Gardens	220-0099	1826 Jamestown Road	Williamsburg, Virginia	23185
Delightful Gardens Landscape Co.	253-1933	7242 Merrimac Trail	Williamsburg, Virginia	23188
Irrigation & Backflow Doctor	585-5879	P.O. Box 6181	Williamsburg, Virginia	23188
Schmidt Landscaping (T.P.S. Inc.)	N/A	2961 Jolly Pond Road	Williamsburg, Virginia	23188
Total Landscapes, LLC	N/A	4 Croaker Circle	Williamsburg, Virginia	23188
Water-Fall Irrigation	291-1420	P.O. Box 5111	Williamsburg, Virginia	23188
Colonial Webb Contractors	855-3006	740C Blue Crab Road	Newport News, Virginia	23606
Kenny's Plumbing & Mechanical, Inc	342-3012	102 Hull Street	Newport News, Virginia	23601
Knight-Scapes LLC	898-3053	143 Herman Melville Ave	Newport News, Virginia	23606
Mason & Son Plumbing & Heating	596-5166	13646 Warwick Blvd.	Newport News, Virginia	23602
National Turf Irrigation	873-2424	11843 Tugboat Lane	Newport News, Virginia	23606
Scott Plumbing	887-8700	18 Yorktown Road	Newport News, Virginia	23603
Ziegler Plumbing	877-2054	15324 A Warwick Blvd.	Newport News, Virginia	23602
April Showers, Inc.	875-0105	P.O. Box 1068	Yorktown, Virginia	23692
Hampton Roads Irrigation & Landscape	877-3748	2413 Wolf Trap Road, Suite I	Yorktown, Virginia	23692
Just Plumbing	877-8540	P.O. Box 1548	Yorktown, Virginia	23692
Amigo Plumbing & Drain Service	874-1963	P.O. Box 2188	Grafton Virginia	23692
Parkin Plumbing	871-9207	9601 Ruthville Road	Charles City, Virginia	23030
Aqua Pro Irrigation	739-3228	P.O. Box 1400	Gloucester Point, Virginia	23062
Preferred Plumbing Services, Inc	870-4202	5369 Old Dogwood Lane	Gloucester, Virginia	23061
Thomas & Son's Plumbing, LLC	(804)694-0903	6562 Lake View Drive	Gloucester, Virginia	23061
Backflow Services	565-3648	7992 Sunset Drive	Hayes, Virginia	23072
Chris Plumbing & Backflow Co.	325-7191	760 E. Little Back River Rd.	Hampton, Virginia	23669
Duda's Plumbing	838-2931	300 Pacer's Point	Hampton, Virginia	23669
Parker Mechanical Contractor	851-5195	5 Log Cabin Lane	Hampton, Virginia	23669
Steve Claflin Plumbing	851-6632	232 Chickamauga Pike	Hampton, Virginia	23669
Wythe Plumbing & Heating Co.	771-8566	230 Cherry Ave.	Hampton, Virginia	23661
S & M Pump and Well	986-2213	5151 Carolina Road	Suffolk, Virginia	23434
A. B. Parker & Son	587-0316	814 Norman Avenue	Norfolk, Virginia	23518
Beasley Backflow Service	583-5434	412 Dune Street	Norfolk, Virginia	23503
McCoy Plumbing & Heating, Inc.	461-3550	5121 E. Virginia Beach Blvd., #C-1	Norfolk, Virginia	23502
Myers Plumbing & Heating, Inc.	640-8891	2120 Grandy Ave	Norfolk, Virginia	23504
SimplexGrinnell	853-6611	3750 Progress Rd	Norfolk, Virginia	23502
Chamberlain Mechanical Service	(804)559-8980	6368 Mary Esther Lane	Mechanicsville, Virginia	23111
Eagle Fire Inc.	(804)743-2500	7459 White Pine Road	Richmond, Virginia	23237
Richmond Sprinkler Company	(804)275-6800	2540 Norcliff Road	Richmond, Virginia	23237
Stemmle Plumbing Repair, Inc	(804)744-6401	P.O. Box 35680	Richmond, Virginia	23235
Carolina Fire Control	391-0050	600 Port Centre Pkwy	Portsmouth, Virginia	23704
Tidewater Leak Detection	675-9143	P.O. Box 6733	Portsmouth, Virginia	23703
Lanthorn Const & Plumbing LLC	729-4775	1708 Pitchkettle Rd	Suffolk, Virginia	23434
A A A Backflow Prevention	560-6726	509 Bonsack Court	Chesapeake, Virginia	23322
AJ Land & Lawn	546-1009	1225 Fentress Rd	Chesapeake, Virginia	23322
Coastal Fire Protection	488-8471	921 Corporate Lane, Ste. A	Chesapeake, Virginia	23320
Fire & Life Safety America	485-7486	1113 Cavalier Boulevard	Chesapeake, Virginia	23323
Fire Tech Services, Inc.	523-7330	820 Greenbrier Circle, Suite 9	Chesapeake, Virginia	23320
Hampton Roads Mechanical of VA	436-1120	932 Corporate Lane	Chesapeake, Virginia	23320
Heads Up Sprinkler Systems	485-7353	3716 Cook Boulevard	Chesapeake, Virginia	23323
Hiller Systems	549-9123	1242 Executive Blvd.	Chesapeake, Virginia	23320
John D. Lucey & Son Plbg. & Htg.	543-9441	3203 Bainbridge Blvd.	Chesapeake, Virginia	23324

Patterson Plumbing Service, Inc.	(804)275-1067	P.O. Box 1406	Chesterfield, Virginia	23832
A-1 Sewer & Drain, Inc.	467-0000	516 S. Military Highway	Virginia Beach, Virginia	23464
Atlantic Heating & Cooling	460-6100	553 Central Drive	Virginia Beach, Virginia	23454
Atomic Plumbing & Drain	464-2934	1377 London Bridge Road	Virginia Beach, Virginia	23453
Mid Atlantic Fire Protection Inc.	455-8888	5596 Greenwich Road	Virginia Beach, Virginia	23462
Virginia Backflow Service	635-3001	P. O. Box 62751	Virginia Beach, Virginia	23466
Virginia Sprinkler Company, Inc.	213-3660	1417 Miller Store Road, Suite C	Virginia Beach, Virginia	23455
Virginia Sprinkler Company	(804)459-2200	510343-A Kings Acres Road	Ashland, Virginia	23005
Mid Atlantic Cross Connection Control	(804)526-5996	203 Walkers Cove Drive	Colonial Heights, Virginia	23466
Walker Distribution & Service, Inc.	(804)590-2562	100001River Road	Matoaca, Virginia	23803
Riley Fire Protection, LLC	(804)335-8257	13200 Dawnwood Ct	Midlothian, Virginia	23114
C.P. Mayhew Inc	(804)366-2094	2543 Georges Road	Powhatan, Virginia	23139
Collier Companies	(804)378-1414	1500 Oakbridge Terrace	Powhatan, Virginia	23139
Dominion Backflow Service	(804)901-3239	1257 Schroeder Rd	Powhatan, Virginia	23139
Irrigation Concepts LLC	(804)822-0083	3320 John Tree Hill Road	Powhatan, Virginia	23139
Residential Fire Protection	(804)749-8788	11501 Primrose Lane	Rockville, Virginia	23146
Water and Power Technologies	(434)864-9420	10521 Judicial Dr. Suite 205	Fairfax, Virginia	22030
Cross Connection Services	(540)400-6080	3799 Sandlewood Road	Roanoke, Virginia	24018
VFP Fire Systems	(800)244-6840	41 3 rd Avenue West, PO Box 9388	Huntington, West Virginia	25701

- **Only Commonwealth of Virginia Department of Professional & Occupational Regulation (DPOR) certified backflow device workers may test backflow preventers in the JCSA Service Area.** Other licensed backflow contractors, not listed, may also test backflow preventers provided they are Virginia DPOR certified. The JCSA does not accept backflow testing certifications issued by local municipalities.
- **Backflow Preventer test are required annually and the test results are to be recorded on the JCSA test form(s) and original is to be returned to the address supplied on the test form.** JCSA Backflow Prevention Assembly Test Forms and the most current list of certified testers are also available on the Internet at: www.jamescitycountyva.gov/jcsa (utilizing the links below the "Program Summary").
- Please include the **customer's address and phone number** on each test form.
- The JCSA highly recommends that whenever customers prepare to hire someone to test their assemblies they should inquire of the proper State DPOR approved backflow inspection credentials of those being considered as certifications are subject to suspension, revocation and expiration. Customers may also check the current status of the contractor's license at the Commonwealth's DPOR website (click on "License Lookup" at www.dpor.virginia.gov) or by calling (804) 367-8511.
- Virginia licensed backflow testers, with the appropriate credentials for testing backflow devices, and interested in being listed here should contact the Cross Connection Control Coordinator for the JCSA, at (757) 259-4138.

IF THIS IS A NEW INSTALLATION PLEASE ENTER PLUMBING PERMIT# _____



Backflow Assembly Test Report

Mail original completed form, one for each assembly, to:
JAMES CITY SERVICE AUTHORITY
Utility Operations Division
Attention: Cross Connection Control Coordinator
119 Tewning Road, Williamsburg, Virginia 23188-2639 (757) 259-4138

Name of Homeowner or Premises: _____
Service Address: _____
Mailing Address: (if different) _____

Use and location of the assembly: _____
Manufacturer: _____ Model: _____
Serial #: _____ Size: _____
Line pressure at time of test: _____

New Installation Replacement Assembly Existing Assembly Retest?
RP DCVA PVB SVB

Check Valve #1	Check Valve #2	Differential Pressure Relief Valve	Pressure Vacuum Breaker
<input type="checkbox"/> Leaked <input type="checkbox"/> Closed Tight	<input type="checkbox"/> Leaked <input type="checkbox"/> Closed Tight	Opened at _____ PSI <input type="checkbox"/> Did Not Open	Air Inlet opened at _____ PSI <input type="checkbox"/> Did Not Open
Drop Across CV #1 _____ PSI	Drop Across CV #2 _____ PSI	Buffer _____ PSI	Check Valve _____ PSI <input type="checkbox"/> Leaked

Condition of outlet control valve: Closed Tight Leaking
Remarks: _____

CERTIFICATION: I have completed the above test and hereby certify that this backflow device performed satisfactorily and meets all Federal, State, and local codes and regulations as required.

Date: _____ Time: _____ Tester Certification #: _____

Name of Tester (Print): _____

Company Name: _____ Company Telephone: _____

Signature of Tester: _____

Gauge Manufacturer and Model: _____ Serial #: _____

Date of Last Calibration of Test Gauges: _____

THIS ASSEMBLY: PASSED FAILED

JCSA Office Use Only: Inspection _____ W/O _____