Appendix 12-2

Cross Connection Control Procedures Manual
CITY OF OLYMPIA

Cross Connection Control
Procedures Manual
Program Administration, Requirements and Implementation

August 2009

This document contains the minimum elements required under WAC 246-290-490 and provides the details supportive of Olympia Municipal Code 13.04.110.
Appendix A – Extracts from chapter 246-290 WAC Group A Drinking Water Rules
Appendix B – Procedure for Issuing a Civil Infraction
Appendix C – Standard Operating Procedures Associated Cross Connection Control
Appendix D – City of Olympia Test Report Form
Appendix E – City of Olympia Backflow Incident Form
Foreword

This Cross Connection Control Procedures Manual, used in conjunction with Olympia Municipal Code 13.04 and state regulations WAC 246-290-490, outlines the framework for implementing cross connection control requirements at the City of Olympia. This manual reflects years of implementation practices in protecting the City's drinking water supply from cross connections and backflow incidents using industry standards and good engineering practices.

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Public Works Department
Chapter 1 – Introduction

PURPOSE AND SCOPE

This document contains the Cross Connection Control Plan (Plan) for the City of Olympia. The purpose of the Plan is to meet the cross connection control requirements of Group A Public Water Supplies, WAC 246-290-490, provide a clear direction for program implementation activities, describe policies and procedures, and summarize current City, state, and federal requirements regarding cross connection control. The Plan is structured such that it may be supplemented with published documents and materials developed by Public Works, Water Resources for its specific use. The authority to enforce these practices and policies is established in City Municipal Code 13.04.110 and Ordinance 6312.

Cross connection control is an integral part of the multiple-barrier approach to ensuring safe drinking water. The mission of Water Resources is to provide and protect nature’s water for a healthy community. Implementation of the Plan results in protecting the City’s water system from contamination from the customer’s plumbing supply/system through proper installation of the right backflow prevention assembly and annual testing of these assemblies by Washington State Department of Health (DOH) certified Backflow Assembly Testers (BAT).

DEFINITIONS

The following words are frequently used throughout the Plan and their definitions are as follows:

“Approved air gap (AG)” means a physical separation between the free flowing end of a potable water supply pipeline and the overflow rim of an open or non-pressurized receiving vessel. This separation must be at least:

- Twice the diameter of the supply piping measured vertically from the overflow rim of the receiving vessel, and in no case be less than one inch, when unaffected by vertical surfaces (sidewalls); and:
- Three times the diameter of the supply piping if the horizontal distance between the supply pipe and a vertical surface (sidewall) is less than or equal to three times the diameter of the supply pipe, or if the horizontal distance between the supply pipe and intersecting vertical surfaces (sidewalls) is less than or equal to four times the diameter of the supply pipe and in no case less than one and one-half inches.

“Approved atmospheric vacuum breaker (AVB)” means an AVB or make, model, and size that is approved by the DOH. AVBs that appear on the current approved backflow prevention assemblies list developed by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research or that are listed or approved by other nationally recognized testing agencies (such as IAPMO, ANSI, or UL) acceptable to the authority having jurisdiction are considered approved by the DOH.
“Approved backflow prevention assembly” means a reduced pressure backflow assembly (RPBA), a reduced pressure detector assembly (RPDA), a double check valve assembly (DCVA), a double check detector assembly (DCDA), a pressure vacuum breaker assembly (PVBA), or a spill resistant vacuum breaker (SVBA) of make, model, and size that is approved by DOH. Assemblies that appear on the current approved backflow prevention assemblies list developed by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research or other entity acceptable to the DOH are considered approved by the DOH.

“Authority having jurisdiction” (formerly known as local administrative authority) means the local official, board, department, or agency authorized to administer and enforce the provisions of the Uniform Plumbing Code as adopted under chapter 19.27 RCW.

“Backflow” means the undesirable reversal of flow of water or other substances through a cross connection into the public water system or consumer’s potable water system.

“Cross connection” means any actual or potential physical connection between a public water system or the consumer’s water system and any source of nonpotable liquid, solid, or gas that could contaminant the potable water supply by backflow.

“Category of contaminant” means a communicable disease, chemical, or physical hazard. Communicable diseases and chemical hazards can cause illness and in some cases death and are high health hazards. Physical hazards such as gasoline, propane, hot water and steam are examples of both low and high health hazards.

“Degree of hazard” means either a low cross connection hazard or a high health cross connection hazard.

“High health cross connection hazard” means a cross connection involving any substance that could impair the quality of potable water and create and actual public health hazard through injury, poisoning, or spread of disease. WAC 246-290-490 refers to these types of hazards as Table 9 hazards.

“In-premises protection” means a method of protecting the health of consumers served by the consumer’s potable water system, located within the property lines of the consumer’s premises by the installation of approved air gap or backflow prevention assembly at the point of hazard, which is generally a plumbing fixture.

“Low cross connection hazard” means a cross connection that could impair the quality of potable water to a degree that does not create a hazard to the public health, but does adversely and unreasonably affect the aesthetic qualities of potable waters for domestic use.

“Premises isolation” means a method of protecting a public water system by installation of approved air gaps or approved backflow prevention assemblies at or near the service connection or alternative location acceptable to the purveyor to isolate the consumer’s water system from the purveyor’s distribution system.
"Purveyor" means an agency, subdivisions of the state, municipal corporation, firm, company, mutual or cooperative association, institution, partnership, or person or other entity owning or operating a public water system. Purveyor also means the authorized agents or these entities.

See Appendix A for a copy of DOH’s publication which contains extracts of chapter 246-290 WAC, which covers minimum cross connection control requirements as well as additional definitions.

CITY, STATE, AND FEDERAL PROGRAM HISTORY

The requirement for the City to have a Cross Connection Control Program (Program) is not something new. State regulations administered by DOH, dating back to 1970 require the City’s water system be protected from backflow and cross connection contamination. Though the federal Safe Drinking Water Act (SDWA) passed by Congress in 1974 does not specifically address the topic of cross connection control, it does state water purveyors are responsible for the water quality delivered to the customer’s meter. The Environmental Protection Agency, which administers the SDWA, developed a series of nine “white papers” on distribution system issues of potentially significant public health concern. One was on the potential of contamination due to cross connections and backflow and the associated health risks. Water industry experts expect future federal rule making will require water purveyors develop and implement a cross connection control program.

The City’s Program was developed in the mid-1990s and included not only the requirement of installing approved assemblies and testing of these assemblies but also a Tester Approval Process certification. The development of this certification program was in response to concerns and deficiencies identified with testers performing work within the City. This certification required private testers testing assemblies on the City’s water system to take a written and hands-on proficiency test dealing with troubleshooting and repair of backflow assemblies. Due to concerns of duplicating DOH certification efforts of testers, the City’s certification process ended in 2004 and the City relies solely on DOH’s certification program.

BACKFLOW PREVENTION ASSEMBLIES

Approved backflow prevention assemblies are those which appear on the current approved backflow prevention assemblies list developed by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research. This institute is currently the only one which the DOH recognizes as having the authority to approve backflow prevention assemblies. The backflow prevention assemblies include:

1. Atmospheric Vacuum Breakers (AVB)
2. Reduced Pressure Principle Backflow Assembly (RPBA)
Chapter 2 – Program Implementation and Administration

RESPONSIBILITIES

The Water Resources Line of Business, within the City’s Public Works Department, carries out the functions of the City’s public water supply. All public water systems have a person who is the primary operator in responsible charge of operating the water system. The purveyor position resides in the Pump Stations Program within the Water Resources Line of Business. WAC 246-290-490, states the water purveyor has the responsibility for cross connection control and it shall begin at the water supply source, include all the public water treatment, storage, and distribution facilities, and end at the point of delivery to the consumer’s water system, which begins at the downstream end of the service connection or water meter (e.g. premises isolation). The regulation further requires the water purveyor ensure at least one individual is certified as a Cross Connection Specialist (CCS) in order to develop and implement the Program. The City’s Cross Connection Control Specialist (CCCS) position resides in the Water Resources Line of Business and is in the Water Quality Program.

The water purveyor has the responsibility of premises isolation. The practice of premises isolation is used to protect against cross connections on the customer’s premise where actual or potential hazards exist. Under this philosophy, the customers’ premise is separated from the City’s water system by means of a backflow prevention assembly installed at the service connection, immediately downstream of the water meter.

The City’s Community Planning and Development (CP&D) has the authority and jurisdiction for any issues within the consumer’s water system, per chapter 19.27 RCW. This type of protection is often referred to as “in-premise” isolation. In-premise isolation protects the health of the consumers served by their water/plumbing system by the installation of an approved air gap or approved backflow prevention assembly at the point of hazard.

The water customer is responsible for identifying and eliminating cross connections or controlling them through the installation, regular testing, and maintenance of approved backflow prevention assemblies. The water customer is responsible for providing the necessary information, scheduling, and providing access for inspection of cross connection potential and the necessary control methods. The water customer is responsible for notifying Public Works, Water Resources of any assembly the customer believes is no longer required. Finally, the water customer is responsible for all costs associated with the inspection, testing, repair, and replacement of backflow prevention assemblies.
The City’s Program is a combination program because it relies on both premises and in-premises isolation to protect the City’s water system from contamination.

ENFORCEMENT AUTHORITY

The control or elimination of cross connections shall be done according to the most current revisions of state and local rules and regulations. State regulations include:

- RCW 19.27, Washington State Building Code
- RCW 43.20.050, Washington State Powers and Duties of the State Board of Health
- RCW 70.119A.060, Washington State Public Water Systems Mandate
- WAC 246-290-490, Cross Connection Control

Local rules and regulations include Olympia Municipal Code (OMC) chapter 13.04, which is the authority for the Drinking Water Utility to enforce the City’s Program. Section 13.04.110, states cross connections are prohibited and gives the City authority to discontinue water service until correction is made. Where cross connections cannot be eliminated, they are controlled by installation of an approved backflow assembly preventer(s) which are appropriate to the degree of hazard it is protecting against. Section 13.04.440, details the penalties for non-compliance, which are a misdemeanor and/or civil penalty. Each day is a separate violation with the first offense penalty of $103, second offense of $257 and the third offense is $513. See Appendix B for a copy of the procedure for issuing civil penalties under the OMC.

Ordinance 6312, the City’s Development Guidelines and Construction Standards (EDDS), contains the requirements for civil engineering infrastructure as adopted by the Olympia City Council. The EDDS is comprised of both written text and standard details that specify how infrastructure is constructed. These improvements include streets, driveways, sidewalks, curbs, street lighting, street trees, water, sewer, storm drainage, and solid waste. Chapter 6 contains the requirements for cross connection control associated with all new construction and remodels and can be found online at

ADMINISTRATION

The functions of the Program are primarily carried out by the CCCS and include survey, inspection, testing, notification, enforcement, and record keeping. The minimum City certification requirements for the position include DOH certifications as a CCS and BAT.

This position works closely with CP&D inspectors regarding new and remodeled properties; Technical Services engineers on capital improvement projects; Washington State Department of Health, Office of Drinking Water on high health hazard premises and backflow incidents; Thurston County Environmental Health on backflow incidents; contractors and BATs. The inspection, repair, and annual testing of backflow prevention assemblies for City sewer pump stations is done by DOH certified staff in the Water Resources' Pump Stations Program. This same work for City parks is done by state certified staff in the City's Parks, Arts and Recreation Program. Inspection, repair, and annual testing of backflow prevention assemblies for other City facilities is done by DOH certified Water Resource staff.

GUIDANCE, POLICIES, AND PROCEDURES

Several guidance, policies, and procedures exist for determining the appropriate level of protection. The evaluation for the appropriate level of protection shall be in accordance with the most current editions of the following:

- *Cross Connection Control Manual, Accepted Procedure and Practice* published by the Cross Connection Control Committee of the Pacific Northwest Section of the American Water Works Association
- *Manual of Cross Connection Control* published by the Foundation for Cross Connection Control and Hydraulic Research, University of Southern California
- *Recommended Practice for Backflow Prevention and Cross Connection Control, AWWA M14*, published by the American Water Works Association
- *Chapter 6, Development Guidelines and Construction Standards, City of Olympia*
- *Group A Design Standards*, Washington State Department of Health

The City also enacted various policies to ensure the safety and quality of drinking water for all its customers. Many of these policies are referenced in the proposed 2009 – 2014 Water System Plan. As previously mentioned, the EDDS contains the requirements and policies for new connection or remodels. Existing premises which require backflow protection, but currently do not have them installed, are addressed during remodels, when there is a change in building occupancy, or when program staff becomes aware of them.

The Program also developed several standard operating procedures (SOPs), which are associated with determining the level of protection needed based on the degree of hazard plus several other SOPs associated with connections which receive both potable water and reclaimed water. These SOPs include determining...
unauthorized connection to reclaimed water, inspection and testing of backflow assemblies of water services with reclaimed water, and inspection of potential sites for reclaimed water service. See Appendix C for copies of these documents.

PUBLIC EDUCATION

In 2008, the Cross Connection Control Program developed and distributed a brochure to larger home improvement businesses on the need for backflow protection on home irrigation systems. A utility bill insert also was developed and mailed during this same time. The utility bill insert will become a common item for the spring utility insert. In addition, the City’s website continues to be a valuable source for communicating cross connection control information as well as the annual Drinking Water Report (e.g. Consumer Confidence Report).

Chapter 3 – Assembly Requirements, Notification, Testing, Record Keeping and Reporting

BACKFLOW PREVENTION ASSEMBLY REQUIREMENTS FOR NEW AND EXISTING SERVICES

The City prioritizes its backflow prevention efforts based on acceptable risk (probability of occurrence), category of contaminant, degree of hazard and the reliability of the backflow preventer. Efforts over the last few years have been focused on severe and high health risk premises (commonly referred to as Table 9 hazards) listed in WAC 246-290-490(4). See Appendix A for a copy of DOH’s publication which contains extracts from chapter 246-290-490 pertaining to cross connection control. City resources are being focused on these Table 9 hazards due to the inherent potential contamination these types of cross connection hazards can cause.

For customers requesting new service connections, an initial evaluation of the premises’ planned or future water service is done by the CCCS. Proper selection and installation of a backflow prevention assembly, as determined by the CCCS, shall be a condition of allowing new water service connection. All backflow assemblies installed must be tested immediately upon installation by the CCCS or if he is unavailable, by a Washington State certified backflow assembly tester (BAT). If the initial test fails, it is the responsibility of the applicant/contractor/customer to immediate have the assembly repaired and retested by a Washington State certified BAT. All assemblies must be tested at least annually thereafter by a Washington State certified BAT.
For existing service connections, periodic reevaluations are done by the CCCS in response to remodels, notification by city inspectors, fire department personnel, water quality complaints or concerns with reclaimed water. An emphasis is placed on high health premises (Table 9) followed by low hazard premises.

Below is a summary of requirements based on the evaluation of acceptable risk, degree of hazard, and the reliability of the backflow preventer:

**Commercial/Industrial Service**
The degree of hazard for these types of services is a high health cross connection hazard. An approved premise isolation cross connection control assembly of a RPBA, RPDA or approved AG is required.

**Multi-Family Service**
The degree of hazard for this type of service is a high health cross connection hazard. A residential development having one or more metered connections serving more than two living units per meter will be treated as a commercial service.

**Fire Service**
The degree of hazard for this type of service may be high or low, depending on the type of system installed. For example, backflow protection is not required for residential flow through or combination fire protection systems. However, dry fire suppression systems require a DCDA while a fire suppression system using chemicals requires an RPDA.

**Single-Family Residential Service**
The degree of hazard for this type of service is generally low. However, premises isolation with a RPBA is required if high health hazards exists.

**Irrigation Only Service**
The degree of hazard for this type of service is generally low. An approved DCVA is required as long as no chemicals are involved, otherwise an RPBA is required.

**Reclaimed Water**
The degree of hazard for this type of service is high. A RPBA will be required on the water service to properties which have both potable and reclaimed water.

Installation of a backflow prevention assembly is to be installed as close to the meter as possible. Any deviation from this must be pre-approved by the CCCS. Detailed information pertaining to the backflow prevention assembly installation requirements, can be found online in Chapter 6 of the City’s EDDS at http://www.olympiawa.gov/documents/EngineeringStandardsNew/Chapter6_complete.pdf
NOTIFICATION, TESTING AND BAT REPORTING

There are about 2,000 backflow assemblies installed in the City’s service area which require annual testing. The due date for testing is based on the installation date of the assembly, not when the assembly was last tested. Annual testing shall be done within 30 days of the original test due date. The Drinking Water Utility uses Tokay software to maintain an inventory of all these devices. This database also generates custom reports (e.g., DOH Annual Summary Report statistics), annual testing notifications, and follow-up letters to customers.

Backflow prevention assemblies shall be inspected and tested at the time of:

- Initial installation
- After the assembly is repaired or moved
- Immediately after a backflow incident occurs
- Annually after the initial installation
- As required by the CCCS, if testing indicates repeated failures

The CCCS may require more frequent testing of certain facilities such as a severe health hazard premise (e.g., LOTT wastewater treatment plant) or with premises with repeated annual failures. All testing procedures shall be in accordance with requirements of the Washington State Department of Health.

A water customer will receive up to three notification letters when annual testing is due. The first and second letters give customers approximately 30 days from the receipt of the letter to submit passing test results. The third and final letter gives the customer 15 days before water service is terminated. If the premises involve a separate irrigation line, the meter shall be locked or the hazard eliminated by removing piping so a connection is not possible.

No appeals process is necessary prior to turning off water service because customers are given adequate notification of testing requirements and staff is flexible in working out schedules with them.

BATs can use their own test report form provided it includes the minimum test reporting elements found in Appendix D. Test results are to be emailed, mailed or faxed to the Drinking Water Utility within five working days and contain the signature and printed name of the BAT. The results are then hand entered into the Tokay database. When the field test report shows an assembly has failed its test, the City requires the customer to repair the assembly and return it to proper working condition in an amount of time to be determined on a case-by-case basis, depending on the hazard.

Failure to provide the minimum backflow prevention assembly test report information located in Appendix D will result in the test report being denied and may require the re-testing of the assembly in the presence of the City of Olympia CCCS.
Multiple assembly failures of an assembly will result in the property owner having the assembly repaired or replaced by a certified BAT with an assembly appropriate for the degree of hazard.

The City will notify the Washington State Department of Health, Office of Drinking Water when it suspects a test report is falsified in order for their follow-up.

Retesting may be required, at the City’s discretion, on backflow assemblies which have questionable test results or on assemblies which have test report information which has changed (e.g., the serial number, model number, location, or other information does not match information provided at the time of installation) and no prior notice was given.

**RECORD KEEPING AND REPORTING**

Records are kept both in paper and electronic format. As mentioned previously, annual test results are mailed or faxed and results entered into the Tokay database. The City’s work order system is also used to track time spent testing, repairing, or installing an assembly associated with City facilities. Notification and violation letters along with emails are records which are also kept. These records will form the basis of any enforcement action or legal defense by the City. The master list, inventory information, list of approved AVBs, and ASR records are available to DOH upon request.

**Documentation of a BAT Quality Control Assurance Program**
The City requires BATs to submit current copies of their DOH certification (or renewal) and test kit verification of accuracy every January. The City also requires minimum test report content, which can be found in **Appendix D**.

**DOH Annual Summary Report Reporting (ASR)**
2001 was the first reporting year of ASR data to DOH. DOH efforts are focused on larger utilities reporting this information (greater than 1,000 connections) and compliance with Table 9 high health hazards (primarily sewage treatment facilities, sewer lift stations, radioactive plants and medical facilities). The City made great strides in isolating these high health hazards and by end of 2009; all will have premises isolation.

**Master List**
The Tokay database maintains a master list of service connections of high and low hazards for as long as the hazard exists. It is from this database the annual notification letters are generated and sent.

**Inventory of Backflow Prevention Assemblies**
The Tokay database maintains the inventory of active assemblies including the exact assembly location, assembly description (type, manufacturer, model, size and serial number), the assessed degree of hazard, the installation date, history or inspection, tests and repairs, test results and the person performing the inspection. Approved air gaps installed in lieu of approved assemblies and approved AVBs used for irrigation will include the same information as that of mechanical backflow prevention assemblies.
Annual Test Report Results
Though state regulations require retention of all test results for five years, currently, all hard copies and electronic test reports are being kept indefinitely because the City currently has the capacity to store these records.

Responding to Backflow Incidents
In the event of a cross connection incident which contaminates the City’s water supply, or occurs within the premises of a consumer served by the City, the City will notify DOH, CP&D, and the Thurston County Health Department as soon as possible after the incident, but no later than the end of the next business day. If the incident occurs after hours, staff will contact DOH using their emergency after hours phone number (1-877-481-4901). The City will document the details of the backflow incident using the Backflow Incident Report Form found in Appendix E. The City will include all backflow incident report(s) as part of the ASR.

Legal Actions
Letters, emails, summary reports, civil infractions, etc., are elements used to document non-compliance actions when a customer fails to eliminate or control a high health hazard. These documents become permanent records and are kept in accordance with standard retention schedules.
Cross-connection control rules and definitions

Extracts from chapter 246-290 WAC, Group A Drinking Water Rules

WAC 246-290-010 Definitions.

"Approved air gap" means a physical separation between the free-flowing end of a potable water supply pipeline and the overflow rim of an open or non-pressurized receiving vessel. To be an air gap approved by the department, the separation must be at least:

- Twice the diameter of the supply piping measured vertically from the overflow rim of the receiving vessel, and in no case be less than one inch, when unaffected by vertical surfaces (sidewalls); and:

- Three times the diameter of the supply piping, if the horizontal distance between the supply pipe and a vertical surface (sidewall) is less than or equal to three times the diameter of the supply pipe, or if the horizontal distance between the supply pipe and intersecting vertical surfaces (sidewalls) is less than or equal to four times the diameter of the supply pipe and in no case less than one and one-half inches.

"Approved atmospheric vacuum breaker (AVB)" means an AVB of make, model, and size that is approved by the department. AVBs that appear on the current approved backflow prevention assemblies list developed by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research or that are listed or approved by other nationally recognized testing agencies (such as IAPMO, ANSI, or UL) acceptable to the authority having jurisdiction are considered approved by the department.

"Approved backflow preventer" means an approved air gap, an approved backflow prevention assembly, or an approved AVB. The terms "approved backflow preventer," "approved air gap," or "approved backflow prevention assembly" refer only to those approved backflow preventers relied upon by the purveyor for the protection of the public water system. The requirements of WAC 246-290-490 do not apply to backflow preventers installed for other purposes.

Acronyms

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<th>Acronym</th>
<th>Definition</th>
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<tr>
<td>AG</td>
<td>air gap</td>
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<td>AVB</td>
<td>atmospheric vacuum breaker</td>
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<td>AWWA</td>
<td>American Water Works Association</td>
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<td>BAT</td>
<td>backflow assembly tester</td>
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<td>CCS</td>
<td>cross-connection control specialist</td>
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<tr>
<td>DCDA</td>
<td>double check detector assembly</td>
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<tr>
<td>DCVA</td>
<td>double check valve assembly</td>
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<tr>
<td>EPA</td>
<td>U.S. Environmental Protection Agency</td>
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<tr>
<td>IAPMO</td>
<td>International Association of Plumbing and Mechanical Officials</td>
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<tr>
<td>PVBA</td>
<td>pressure vacuum breaker assembly</td>
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<td>RPBA</td>
<td>reduced pressure backflow assembly</td>
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<td>RPDA</td>
<td>reduced pressure detector assembly</td>
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<td>SVBA</td>
<td>spill resistant vacuum breaker assembly</td>
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<td>UPC</td>
<td>Uniform Plumbing Code</td>
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<td>WAC</td>
<td>Washington Administrative Code</td>
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"Approved backflow prevention assembly" means an RPBA, RPDA, DCVA, DCDA, PVBA, or SVBA of make, model, and size that is approved by the department. Assemblies that appear on the current approved backflow prevention assemblies list developed by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research or other entity acceptable to the department are considered approved by the department.

"Authority having jurisdiction" (formerly known as local administrative authority) means the local official, board, department, or agency authorized to administer and enforce the provisions of the Uniform Plumbing Code as adopted under chapter 19.27 RCW.

"Backflow" means the undesirable reversal of flow of water or other substances through a cross-connection into the public water system or consumer's potable water system.

"Backflow assembly tester" means a person holding a valid BAT certificate issued under chapter 246-292 WAC.

"Backpressure" means a pressure (caused by a pump, elevated tank or piping, boiler, or other means) on the consumer's side of the service connection that is greater than the pressure provided by the public water system and which may cause backflow.

"Backsiphonage" means backflow due to a reduction in system pressure in the purveyor's distribution system and/or consumer's water system.

"Combination fire protection system" means a fire sprinkler system that:

- Is supplied only by the purveyor's water;
- Does not have a fire department pumper connection; and
- Is constructed of approved potable water piping and materials that serve both the fire sprinkler system and the consumer's potable water system.

"Consumer" means any person receiving water from a public water system from either the meter, or the point where the service line connects with the distribution system if no meter is present. For purposes of cross-connection control, "consumer" means the owner or operator of a water system connected to a public water system through a service connection.

"Consumer's water system" as used in WAC 246-290-490, means any potable and/or industrial water system that begins at the point of delivery from the public water system and is located on the consumer's premises. The consumer's water system includes all auxiliary sources of supply, storage, treatment, and distribution facilities, piping, plumbing, and fixtures under the control of the consumer.

"Contaminant" means a substance present in drinking water that may adversely affect the health of the consumer or the aesthetic qualities of the water.

"Council" means the Washington state building code council under WAC 51-04-015(2).

"Cross-connection" means any actual or potential physical connection between a public water system or the consumer's water system and any source of nonpotable liquid, solid, or gas that could contaminate the potable water supply by backflow.

"Cross-connection control program" means the administrative and technical procedures the purveyor implements to protect the public water system from contamination via cross-connections as required in WAC 246-290-490.
"Cross-connection control specialist" means a person holding a valid CCS certificate issued under chapter 246-292 WAC.

"Cross-connection control summary report" means the annual report that describes the status of the purveyor's cross-connection control program.

"Department" means the Washington state department of health or health officer as identified in a joint plan of operation under WAC 246-290-030(1).

"Distribution system" means all piping components of a public water system that serve to convey water from transmission mains linked to source, storage and treatment facilities to the consumer excluding individual services.

"Emergency" means an unforeseen event that causes damage or disrupts normal operations and requires immediate action to prevent public health and safety.

"Flow-through fire protection system" means a fire sprinkler system that:

- Is supplied only by the purveyor's water;
- Does not have a fire department pumper connection;
- Is constructed of approved potable water piping and materials to which sprinkler heads are attached; and
- Terminates at a connection to a toilet or other plumbing fixture to prevent stagnant water.

"High health cross-connection hazard" means a cross-connection involving any substance that could impair the quality of potable water and create an actual public health hazard through injury, poisoning, or spread of disease.

"In-premises protection" means a method of protecting the health of consumers served by the consumer's potable water system, located within the property lines of the consumer's premises by the installation of an approved air gap or backflow prevention assembly at the point of hazard, which is generally a plumbing fixture.

"Low cross-connection hazard" means a cross-connection that could impair the quality of potable water to a degree that does not create a hazard to the public health, but does adversely and unreasonably affect the aesthetic qualities of potable waters for domestic use.

"Potable" means water suitable for drinking by the public.

"Premises isolation" means a method of protecting a public water system by installation of approved air gaps or approved backflow prevention assemblies at or near the service connection or alternative location acceptable to the purveyor to isolate the consumer's water system from the purveyor's distribution system.

"Public water system" is defined and referenced under WAC 246-290-020.

"Purveyor" means an agency, subdivision of the state, municipal corporation, firm, company, mutual or cooperative association, institution, partnership, or person or other entity owning or operating a public water system. Purveyor also means the authorized agents of these entities.
Appendix A - Extracts from chapter 246-290 WAC Group A Drinking Water Rules

"Reclaimed water" means effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated, so that as a result of that treatment, it is suitable for beneficial use or a controlled use that would not otherwise occur, and it is no longer considered wastewater.

"Severe health cross-connection hazard" means a cross-connection which could impair the quality of potable water and create an immediate, severe public health hazard through poisoning or spread of disease by contaminants from radioactive material processing plants, nuclear reactors, or wastewater treatment plants.

"State building code" means the codes adopted by and referenced in chapter 19.27 RCW; the state energy code; and any other codes so designated by the Washington state legislature as adopted and amended by the council.

"Unapproved auxiliary water supply" means a water supply (other than the purveyor's water supply) on or available to the consumer's premises that is either not approved for human consumption by the health agency having jurisdiction or is not otherwise acceptable to the purveyor.

"Uniform Plumbing Code" means the code adopted under RCW 19.27.031(4) and implemented under chapter 51-56 WAC. This code establishes statewide minimum plumbing standards applicable within the property lines of the consumer's premises.

"Used water" means water which has left the control of the purveyor.

WAC 246-290-490 Cross-connection control.

(1) Applicability, purpose, and responsibility.

(a) All community water systems shall comply with the cross-connection control requirements specified in this section.

(b) All non-community water systems shall apply the principles and provisions of this section, including subsection (4)(b) of this section, as applicable to protect the public water system from contamination via cross-connections. Noncommunity systems that comply with subsection (4)(b) of this section and the provisions of WAC 51-56-0600 of the UPC (which addresses the installation of backflow preventers at points of water use within the potable water system) shall be considered in compliance with the requirements of this section.

(c) The purpose of the purveyor's cross-connection control program shall be to protect the public water system, as defined in WAC 246-290-010, from contamination via cross-connections.

(d) The purveyor's responsibility for cross-connection control shall begin at the water supply source, include all the public water treatment, storage, and distribution facilities, and end at the point of delivery to the consumer's water system, which begins at the downstream end of the service connection or water meter located on the public right of way or utility-held easement.

(e) Under this section, purveyors are not responsible for eliminating or controlling cross-connections within the consumer's water system. Under chapter 19.27 RCW, the responsibility for cross-connection control within the consumer's water system, i.e., within the property lines of the consumer's premises, lies with the authority having jurisdiction.
(2) General program requirements.

(a) The purveyor shall develop and implement a cross-connection control program that meets the requirements of this section, but may establish a more stringent program through local ordinances, resolutions, codes, bylaws, or operating rules.

(b) Purveyors shall ensure that good engineering and public health protection practices are used in the development and implementation of cross-connection control programs. Department publications and the most recently published editions of references, such as, but not limited to, those listed below, may be used as guidance for cross-connection program development and implementation:

(i) Manual of Cross-Connection Control published by the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California (USC Manual);

(ii) Cross-Connection Control Manual, Accepted Procedure and Practice published by the Pacific Northwest Section of the American Water Works Association (PNWS-AWWA Manual); or


(c) The purveyor may implement the cross-connection control program, or any portion thereof, directly or by means of a contract with another agency or party acceptable to the department.

(d) The purveyor shall coordinate with the authority having jurisdiction in all matters concerning cross-connection control. The purveyor shall document and describe the coordination, including delineation of responsibilities, in the written cross-connection control program required in (e) of this subsection.

(e) The purveyor shall include a written description of the cross-connection control program in the water system plan required under WAC 246-290-100 or the small water system management program required under WAC 246-290-105. The cross-connection control program shall include the minimum program elements described in subsection (3) of this section.

(f) The purveyor shall ensure that cross-connections between the distribution system and a consumer's water system are eliminated or controlled by the installation of an approved backflow preventer commensurate with the degree of hazard. This can be accomplished by implementation of a cross-connection program that relies on:

(i) Premises isolation as defined in WAC 246-290-010; or

(ii) Premises isolation and in-premises protection as defined in WAC 246-290-010.

(g) Purveyors with cross-connection control programs that rely both on premises isolation and in-premises protection:

(i) Shall comply with the premises isolation requirements specified in subsection (4)(b) of this section; and

(ii) May reduce premises isolation requirements and rely on in-premises protection for premises other than the type addressed in subsection (4)(b) of this section, only if the following conditions are met:

(A) The in-premises backflow preventers provide a level of protection commensurate with the purveyor's assessed degree of hazard;

(B) Backflow preventers which provide the in-premises backflow protection meet the definition of approved backflow preventers as described in WAC 246-290-010;
(C) The approved backflow preventers are installed, inspected, tested (if applicable), maintained, and repaired in accordance with subsections (6) and (7) of this section;

(D) Records of the backflow preventers are maintained in accordance with subsections (3)(j) and (8) of this section; and

(E) The purveyor has reasonable access to the consumer's premises to conduct an initial hazard evaluation and periodic reevaluations to determine whether the in-premises protection is adequate to protect the purveyor's distribution system.

(h) The purveyor shall take appropriate corrective action as authorized by the legal instrument required by subsection (3)(b) of this section, when:

(i) A cross-connection exists that is not controlled commensurate to the degree of hazard assessed by the purveyor; or

(ii) A consumer fails to comply with the purveyor's requirements regarding the installation, inspection, testing, maintenance or repair of approved backflow preventers required by this chapter.

(i) The purveyor's corrective action may include, but is not limited to:

(i) Denying or discontinuing water service to a consumer's premises until the cross-connection hazard is eliminated or controlled to the satisfaction of the purveyor;

(ii) Requiring the consumer to install an approved backflow preventer for premises isolation commensurate with the degree of hazard; or

(iii) The purveyor installing an approved backflow preventer for premises isolation commensurate with the degree of hazard.

(j) Except in the event of an emergency, purveyors shall notify the authority having jurisdiction prior to denying or discontinuing water service to a consumer's premises for one or more of the reasons listed in (h) of this subsection.

(k) The purveyor shall prohibit the intentional return of used water to the purveyor's distribution system. Used water includes, but is not limited to, water used for heating, cooling, or other purposes within the consumer's water system.

(3) Minimum elements of a cross-connection control program.

(a) To be acceptable to the department, the purveyor's cross-connection control program shall include the minimum elements identified in this subsection.

(b) **Element 1:** The purveyor shall adopt a local ordinance, resolution, code, bylaw, or other written legal instrument that:

(i) Establishes the purveyor's legal authority to implement a cross-connection control program;

(ii) Describes the operating policies and technical provisions of the purveyor's cross-connection control program; and

(iii) Describes the corrective actions used to ensure that consumers comply with the purveyor's cross-connection control requirements.

(c) **Element 2:** The purveyor shall develop and implement procedures and schedules for evaluating new and existing service connections to assess the degree of hazard posed by the consumer's premises to the purveyor's distribution system and notifying the consumer within a reasonable time frame of the hazard evaluation results. At a minimum, the program shall meet the following:
(i) For connections made on or after April 9, 1999, procedures shall ensure that an initial evaluation is conducted before water service is provided;

(ii) For all other connections, procedures shall ensure that an initial evaluation is conducted in accordance with a schedule acceptable to the department; and

(iii) For all service connections, once an initial evaluation has been conducted, procedures shall ensure that periodic reevaluations are conducted in accordance with a schedule acceptable to the department and whenever there is a change in the use of the premises.

(d) **Element 3**: The purveyor shall develop and implement procedures and schedules for ensuring that:

(i) Cross-connections are eliminated whenever possible;

(ii) When cross-connections cannot be eliminated, they are controlled by installation of approved backflow preventers commensurate with the degree of hazard; and

(iii) Approved backflow preventers are installed in accordance with the requirements of subsection (6) of this section.

(e) **Element 4**: The purveyor shall ensure that personnel, including at least one person certified as a CCS, are provided to develop and implement the cross-connection control program.

(f) **Element 5**: The purveyor shall develop and implement procedures to ensure that approved backflow preventers relied upon to protect the public water system are inspected and/or tested (as applicable) under subsection (7) of this section.

(g) **Element 6**: The purveyor shall develop and implement a backflow prevention assembly testing quality control assurance program, including, but not limited to, documentation of BAT certification and test kit calibration, test report contents, and time frames for submitting completed test reports.

(h) **Element 7**: The purveyor shall develop and implement (when appropriate) procedures for responding to backflow incidents.

(i) **Element 8**: The purveyor shall include information on cross-connection control in the purveyor's existing program for educating consumers about water system operation. The public education program may include periodic bill inserts, public service announcements, pamphlet distribution, notification of new consumers and consumer confidence reports.

(j) **Element 9**: The purveyor shall develop and maintain cross-connection control records including, but not limited to, the following:

(i) A master list of service connections and/or consumer's premises where the purveyor relies upon approved backflow preventers to protect the public water system from contamination, the assessed hazard level of each, and the required backflow preventer(s);

(ii) Inventory information on backflow preventers that protect the public water system including:

(A) Approved air gaps installed in lieu of approved assemblies including exact air gap location, assessed degree of hazard, installation date, history of inspections, inspection results, and person conducting inspections;

(B) Approved backflow assemblies including exact assembly location, assembly description (type, manufacturer, model, size, and serial number), assessed degree of hazard, installation date, history of inspections, tests and repairs, test results, and person performing tests; and
Appendix A - Extracts from chapter 246-290 WAC Group A Drinking Water Rules

(C) Approved AVBs used for irrigation system applications including location, description (manufacturer, model and size), installation date, history of inspection(s), and person performing inspection(s).

(iii) Cross-connection program summary reports and backflow incident reports required under subsection (8) of this section.

(k) Element 10: Purveyors who distribute and/or have facilities that receive reclaimed water within their water service area shall meet any additional cross-connection control requirements imposed by the department in a permit issued under chapter 90.46 RCW.

(4) Approved backflow preventer selection.

(a) The purveyor shall ensure that a CCS:

(i) Assesses the degree of hazard posed by the consumer's water system upon the purveyor's distribution system; and

(ii) Determines the appropriate method of backflow protection for premises isolation as described in Table 8.

<table>
<thead>
<tr>
<th>Degree of Hazard</th>
<th>Application Condition</th>
<th>Appropriate Approved Backflow Preventer</th>
</tr>
</thead>
<tbody>
<tr>
<td>High health cross-connection hazard</td>
<td>Backsiphonage or backpressure backflow</td>
<td>AG, RPBA, or RPDA</td>
</tr>
<tr>
<td>Low cross-connection hazard</td>
<td>Backsiphonage or backpressure backflow</td>
<td>AG, RPBA, RPDA, DCVA, or DCDA</td>
</tr>
</tbody>
</table>

(b) Premises isolation requirements.

(i) The purveyor shall ensure that an approved air gap, RPBA, or RPDA is installed for premises isolation for service connections to premises posing a high health cross-connection hazard including, but not limited to, those premises listed in Table 9, except those premises identified as severe in (b)(ii) of this subsection.

(ii) For service connections to premises posing a severe health cross-connection hazard including wastewater treatment plants, radioactive material processing plants, and nuclear reactors, the purveyor shall ensure that either an:

(A) Approved air gap is installed for premises isolation; or

(B) Approved RPBA or RPDA is installed for premises isolation in combination with an in-plant approved air gap.

(iii) If the purveyor's CCS determines that no hazard exists for a connection serving premises of the type listed in Table 9, the purveyor may grant an exception to the premises isolation requirements of (b)(i) of this subsection.

(iv) The purveyor shall document, on a case-by-case basis, the reasons for granting an exception under (b)(i) of this subsection and include the documentation in the cross-connection control program annual summary report required in subsection (8) of this section.

WA State CCC Rules Effective February 14, 2008
### TABLE 9

SEVERE* AND HIGH HEALTH CROSS-CONNECTION HAZARD PREMISES REQUIRING PREMISES ISOLATION BY AG OR RPBA

<table>
<thead>
<tr>
<th>Premises</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural (farms and dairies)</td>
</tr>
<tr>
<td>Beverage bottling plants</td>
</tr>
<tr>
<td>Car washes</td>
</tr>
<tr>
<td>Chemical plants</td>
</tr>
<tr>
<td>Commercial laundries and dry cleaners</td>
</tr>
<tr>
<td>Premises where both reclaimed water and potable water are provided</td>
</tr>
<tr>
<td>Film processing facilities</td>
</tr>
<tr>
<td>Food processing plants</td>
</tr>
<tr>
<td>Hospitals, medical centers, nursing homes, veterinary, medical and dental clinics, and blood plasma centers</td>
</tr>
<tr>
<td>Premises with separate irrigation systems using the purveyor's water supply and with chemical addition*</td>
</tr>
<tr>
<td>Laboratories</td>
</tr>
<tr>
<td>Metal plating industries</td>
</tr>
<tr>
<td>Mortuaries</td>
</tr>
<tr>
<td>Petroleum processing or storage plants</td>
</tr>
<tr>
<td>Piers and docks</td>
</tr>
<tr>
<td>Radioactive material processing plants or nuclear reactors*</td>
</tr>
<tr>
<td>Survey access denied or restricted</td>
</tr>
<tr>
<td>Wastewater lift stations and pumping stations</td>
</tr>
<tr>
<td>Wastewater treatment plants*</td>
</tr>
<tr>
<td>Premises with an unapproved auxiliary water supply interconnected with the potable water supply</td>
</tr>
</tbody>
</table>

* For example, parks, playgrounds, golf courses, cemeteries, estates, etc.

* RPBAs for connections serving these premises are acceptable only when used in combination with an in-plant approved air gap; otherwise, the purveyor shall require an approved air gap at the service connection.
Appendix A - Extracts from chapter 246-290 WAC Group A Drinking Water Rules

(c) Backflow protection for single-family residences.
   (i) For single-family residential service connections, the purveyor shall comply with the
   premises isolation requirements of (b) of this subsection when applicable.
   (ii) If the requirements of (b) of this subsection do not apply and the requirements specified in
   subsection (2) (g)(ii) of this section are met, the purveyor may rely on backflow protection
   provided at the point of hazard in accordance with WAC 51-56-0600 of the UPC for hazards
   such as, but not limited to:
   (A) Irrigation systems;
   (B) Swimming pools or spas;
   (C) Ponds; and
   (D) Boilers.
   For example, the purveyor may accept an approved AVB on a residential irrigation system, if
   the AVB is properly installed under the UPC.

(d) Backflow protection for fire protection systems.
   (i) Backflow protection is not required for residential flow-through or combination fire
   protection systems constructed of potable water piping and materials.
   (ii) For service connections with fire protection systems other than flow-through or combination
   systems, the purveyor shall ensure that backflow protection consistent with WAC 51-56-0600
   of the UPC is installed. The UPC requires minimum protection as follows:
   (A) An RPBA or RPDA for fire protection systems with chemical addition or using
   unapproved auxiliary water supply; and
   (B) A DCVA or DCDA for all other fire protection systems.
   (iii) For connections made on or after April 9, 1999, the purveyor shall ensure that backflow
   protection is installed before water service is provided.
   (iv) For existing fire protection systems:
   (A) With chemical addition or using unapproved auxiliary supplies, the purveyor shall ensure
   that backflow protection is installed within ninety days of the purveyor notifying the
   consumer of the high health cross-connection hazard or in accordance with an alternate
   schedule acceptable to the purveyor.
   (B) Without chemical addition, without on-site storage, and using only the purveyor's water
   (i.e., no unapproved auxiliary supplies on or available to the premises), the purveyor shall
   ensure that backflow protection is installed in accordance with a schedule acceptable to
   the purveyor or at an earlier date if required by the code official administering the State
   Building Code as defined in chapter 51-04 WAC.
   (C) When establishing backflow protection retrofitting schedules for fire protection systems
   that have the characteristics listed in (d)(iv)(B) of this subsection, the purveyor may
   consider factors such as, but not limited to, impacts of assembly installation on sprinkler
   performance, costs of retrofitting, and difficulty of assembly installation.
Appendix A - Extracts from chapter 246-290 WAC Group A Drinking Water Rules

(e) Purveyors may require approved backflow preventers commensurate with the degree of hazard as determined by the purveyor to be installed for premises isolation for connections serving premises that have characteristics such as, but not limited to, the following:

(i) Complex plumbing arrangements or plumbing potentially subject to frequent changes that make it impracticable to assess whether cross-connection hazards exist;

(ii) A repeated history of cross-connections being established or reestablished; or

(iii) Cross-connection hazards are unavoidable or not correctable, such as, but not limited to, tall buildings.

(5) Approved backflow preventers.

(a) The purveyor shall ensure that all backflow prevention assemblies relied upon by the purveyor are models included on the current list of backflow prevention assemblies approved for use in Washington state. The current approved assemblies list is available from the department upon request.

(b) The purveyor may rely on testable backflow prevention assemblies that are not currently approved by the department, if the assemblies:

(i) Were included on the department and/or USC list of approved backflow prevention assemblies at the time of installation;

(ii) Have been properly maintained;

(iii) Are commensurate with the purveyor's assessed degree of hazard; and

(iv) Have been inspected and tested at least annually and have successfully passed the annual tests.

(c) The purveyor shall ensure that an unlisted backflow prevention assembly is replaced by an approved assembly commensurate with the degree of hazard, when the unlisted assembly:

(i) Does not meet the conditions specified in (b)(i) through (iv) of this subsection;

(ii) Is moved; or

(iii) Cannot be repaired using spare parts from the original manufacturer.

(d) The purveyor shall ensure that AVBs meet the definition of approved atmospheric vacuum breakers as described in WAC 246-290-010.

(6) Approved backflow preventer installation.

(a) The purveyor shall ensure that approved backflow preventers are installed in the orientation for which they are approved (if applicable).

(b) The purveyor shall ensure that approved backflow preventers are installed in a manner that:

(i) Facilitates their proper operation, maintenance, inspection, in-line testing (as applicable), and repair using standard installation procedures acceptable to the department such as those in the USC Manual or PNWS-AWWA Manual;

(ii) Ensures that the assembly will not become submerged due to weather-related conditions such as flooding; and

(iii) Ensures compliance with all applicable safety regulations.
Appendix A - Extracts from chapter 246-290 WAC Group A Drinking Water Rules

(c) The purveyor shall ensure that approved backflow assemblies for premises isolation are installed at a location adjacent to the meter or property line or an alternate location acceptable to the purveyor.

(d) When premises isolation assemblies are installed at an alternate location acceptable to the purveyor, the purveyor shall ensure that there are no connections between the point of delivery from the public water system and the approved backflow assembly, unless the installation of the connection meets the purveyor's cross-connection control requirements and is specifically approved by the purveyor.

(e) The purveyor shall ensure that approved backflow preventers are installed in accordance with the following time frames:

(i) For connections made on or after April 9, 1999, the following conditions shall be met before service is provided:
   (A) The provisions of subsection (3)(d)(ii) of this section; and
   (B) Satisfactory completion of the requirements of subsection (7) of this section.

(ii) For existing connections where the purveyor identifies a high health cross-connection hazard, the provisions of (3)(d)(ii) of this section shall be met:
   (A) Within ninety days of the purveyor notifying the consumer of the high health cross-connection hazard; or
   (B) In accordance with an alternate schedule acceptable to the purveyor.

(iii) For existing connections where the purveyor identifies a low cross-connection hazard, the provisions of subsection (3)(d)(ii) of this section shall be met in accordance with a schedule acceptable to the purveyor.

(f) The purveyor shall ensure that bypass piping installed around any approved backflow preventer is equipped with an approved backflow preventer that:

(i) Affords at least the same level of protection as the approved backflow preventer that is being bypassed; and

(ii) Complies with all applicable requirements of this section.

(7) Approved backflow preventer inspection and testing.

(a) For backflow preventers that protect the public water system, the purveyor shall ensure that:

(i) A CCS inspects backflow preventer installations to ensure that protection is provided commensurate with the assessed degree of hazard;

(ii) Either a BAT or CCS inspects:
   (A) Air gaps installed in lieu of approved backflow prevention assemblies for compliance with the approved air gap definition; and
   (B) Backflow prevention assemblies for correct installation and approval status.

(iii) A BAT tests approved backflow prevention assemblies for proper operation.
Appendix A - Extracts from chapter 246-290 WAC Group A Drinking Water Rules

(b) The purveyor shall ensure that inspections and/or tests of approved air gaps and approved backflow assemblies that protect the public water system are conducted:

(i) When any of the following occur:
   (A) Upon installation, repair, reinstallion, or relocation of an assembly;
   (B) Upon installation or replumbing of an air gap;
   (C) After a backflow incident involving the assembly or air gap; and

(ii) Annually thereafter, unless the purveyor requires more frequent testing for high hazard premises or for assemblies that repeatedly fail.

(c) The purveyor shall ensure that inspections of AVBs installed on irrigation systems are conducted:

(i) At the time of installation;

(ii) After a backflow incident; and

(iii) After repair, reinstallation, or relocation.

(d) The purveyor shall ensure that approved backflow prevention assemblies are tested using procedures acceptable to the department, such as those specified in the most recently published edition of the USC Manual. When circumstances, such as, but not limited to, configuration or location of the assembly, preclude the use of USC test procedures, the purveyor may allow, on a case-by-case basis, the use of alternate (non-USC) test procedures acceptable to the department.

(e) The purveyor shall ensure that results of backflow prevention assembly inspections and tests are documented and reported in a manner acceptable to the purveyor.

(f) The purveyor shall ensure that an approved backflow prevention assembly or AVB, whenever found to be improperly installed, defective, not commensurate with the degree of hazard, or failing a test (if applicable) is properly reinstalled, repaired, overhauled, or replaced.

(g) The purveyor shall ensure that an approved air gap, whenever found to be altered or improperly installed, is properly replumbed or, if commensurate with the degree of hazard, is replaced by an approved RPBA.

(8) Recordkeeping and reporting.

(a) Purveyors shall keep cross-connection control records for the following time frames:

(i) Records pertaining to the master list of service connections and/or consumer’s premises required in subsection (3)(j)(i) of this section shall be kept as long as the premises pose a cross-connection hazard to the purveyor’s distribution system;

(ii) Records regarding inventory information required in subsection (3)(j)(ii) of this section shall be kept for five years or for the life of the approved backflow preventer whichever is shorter; and

(iii) Records regarding backflow incidents and annual summary reports required in subsection (3)(j)(iii) of this section shall be kept for five years.

(b) Purveyors may maintain cross-connection control records in original form or transfer data to tabular summaries.

(c) Purveyors may maintain records or data in any media, such as paper, film, or electronic format.
Appendix A - Extracts from chapter 246-290 WAC Group A Drinking Water Rules

(d) The purveyor shall complete the cross-connection control program summary report annually. Report forms and guidance on completing the report are available from the department.

(e) The purveyor shall make all records and reports required in subsection (3)(j) of this section available to the department or its representative upon request.

(f) The purveyor shall notify the department, authority having jurisdiction, and local health jurisdiction as soon as possible, but no later than the end of the next business day, when a backflow incident is known by the purveyor to have:

(i) Contaminated the public water system; or

(ii) Occurred within the premises of a consumer served by the purveyor.

(g) The purveyor shall:

(i) Document details of backflow incidents contaminating the public water system on a backflow incident report form available from the department; and

(ii) Include all backflow incident report(s) in the annual cross-connection program summary report referenced in (d) of this subsection, unless otherwise requested by the department.

For more information

Call the Office of Drinking Water Cross-Connection Control Program staff at (360) 236-3133, (360) 236-3132 or toll-free (800) 521-0323.
City of Olympia
Water Resources
Procedure for Issuing Civil Infractions for Cross Connections

Section 1
Purpose
This procedure provides direction for the City of Olympia’s Cross Connection Control (CCC) Program by:

1. Identifying the authority under Olympia Municipal Code (OMC) Chapter 13.04.440 to issue civil infractions to individuals failing to eliminate or isolate cross connections.
2. Identify the coordination needed with City Code Enforcement Officers to initiate civil infractions.
3. Outlining the process for implementing this procedure.

Section 2
Background
The City’s Cross Connection Control Program focuses on requiring all new water system connections serving commercial buildings or properties with a high health cross connection hazard premises, commonly called a Table 9 hazard under state regulations, to meet backflow prevention requirements before water service is provided.

Not all of the existing water connections serving commercial buildings with a potential for a health hazard are protected due to the program being run as a combination program rather than a premises isolation program which is now required for all commercial properties. Current notification to these customers includes up to three letters before termination of water service occurs.

The City of Olympia’s Code Enforcement Division in Community Planning & Development’s Community Services Line of Business primarily focuses on Title 8 Nuisances, Title 16 Building and Construction (property maintenance, electrical and general building safety) and Title 18 Unified Development Code (zoning, signs and critical areas) because of limited resources (3.5 FTE).

Section 3
Authority
Department of Health (DOH) regulations, WAC 246-290-490(3)(b)(i)-(iii), requires the adoption of a local ordinance, resolution, code, bylaw, or other written legal instrument establishing the purveyor’s legal authority to implement a cross connection control program. The City’s CCC
Appendix B – Procedure for Issue a Civil Infraction

Program uses OMC 13.04.110, OMC 13.04.440 and Ordinance 6312, Engineering Design and Development Standards (EDDS) Chapter 6 as its legal authority.

The issuance of a civil infraction under OMC 13.04.440 pertains only to prohibiting cross connections as identified in OMC 13.04.110. Initiating a civil infraction will be done through one of the City’s Code Enforcement Officers.

The enforcement actions which can be taken under the EDDS are shutting off water when the backflow prevention device is not promptly repaired or replaced. This generally occurs during the annual testing of the device (Section 6.114). Termination of service can also occur when a customer fails to prevent cross connections (Section 6.116). If the customer fails to install an appropriate backflow prevention device, the City may, at the expense of the owner, install the appropriate backflow prevention device.

Section 4
Initiating a Civil Infraction
The third and final letter sent by Cross Connection Control staff must contain a date by which the backflow prevention device must be installed. Once the final date has passed, and the customer has not complied, call or email the appropriate City Code Enforcement staff. Inform Code Enforcement they will be receiving a copy of the third letter and the program is requesting they issue a notice of violation. Issuance of a notice of violation begins the civil infraction process. A Notice of Violation will be sent to the owner via certified United States Postal Service and also posted in a conspicuous place on the front of the property by the Code Enforcement Officer. The notice will contain a comply-by date and will outline the penalties for non-compliance. The penalties associated with a civil infraction, including statutory assessments are: first offense penalty is $103, second offense is $257 and the third offense is $513. Each day may be considered a separate infraction on a case-by-case basis.

Section 5
Contact Information
- Cross Connection Control 753-8161.
- Code Enforcement Staff:
  - Chris Grabowski – 753-8168 – Eastside area
  - Georgia Sabol – 753-8393 – Westside area
  - Ruth Snyder – 709-2790 - Downtown
Appendix C – Standard Operating Procedures Associated Cross Connection Control

SOP # 20 Cross Connection Control Level of Protection

Note: Only City of Olympia Certified Cross Connection Control (CCS) personnel are authorized to determine the level of hazard protection.

References:
- City Of Olympia Engineering Design and Development Standards, Ordinance 6321
- Washington Administrative Code 246-290-490
- 2006 (or most current) Uniform Plumbing Code
- Washington State List of Approved Backflow Assemblies, DOH publication 331-137
- The most current USC (University of Southern California) List of Approved Backflow Assemblies

A. Determine the degree of hazard.
   1. Severe Health Hazard: A cross connection which could impair the quality of potable water and create an immediate, severe public health hazard through poisoning or spread of disease by contaminants from radioactive material, processing plants, nuclear reactors, or wastewater treatment plants.

   2. High Health Hazard: A cross connection involving any substance that could impair the quality of potable water and create an actual public health hazard through injury, poisoning, or spread of disease. An example is reclaimed water which is water, as a result of treatment of wastewater, is suitable for a direct beneficial use or a controlled use that would not otherwise occur such as settling ponds for aquifer recharge or irrigation use. Regulations prohibit overspray, runoff and ponding of reclaimed water used for irrigation. Reclaimed water is NOT safe for human consumption.

   3. Low Hazard: A cross connection that could impair the quality of potable water to a degree that does not create a hazard to the public health, but does adversely and unreasonably affect the aesthetic qualities of potable waters for domestic use.

B. Determine proper backflow protection based on the degree of hazard.

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Health</td>
<td>AG/RP (air gap or reduced pressure backflow)</td>
</tr>
<tr>
<td>High Health</td>
<td>RP (reduced pressure backflow assembly)</td>
</tr>
<tr>
<td>Low</td>
<td>DC (double check valve assembly)</td>
</tr>
</tbody>
</table>
Appendix C – Standard Operating Procedures Associated Cross Connection Control

Application

1. Backflow protection for all commercial structures new or remodeled shall be a Reduced Pressure Backflow Assembly. (See City standards for installation requirements). This assembly shall be installed prior to the City Of Olympia releasing water meter.

2. Residential Irrigation systems shall be required to install a Double Check Valve Assembly (see City standards for installation requirements).

3. All Class 1,2,3,4 Fire Sprinkler Systems shall be required to install a Double Check Detector Assembly (see City standards and Olympia Fire Department installation requirements). This is for all sprinkler systems that do NOT have an injection system or an auxiliary water source.

4. All Class 5 & 6 Fire Sprinkler Systems shall be required to install a Reduced Pressure Detector Assembly (see City standards and Olympia Fire Department installation requirements). This is required for any system with injection or an auxiliary water source.

5. The order of events for installation of backflow assemblies is:
   • Contractor or Inspector calls for inspection.
   • City CCS determines type of hazard.
   • City CCS selects and inspects proper backflow assembly commensurate with degree of hazard.
   • City CCS inspects for proper installation (orientation, approval, hazard).
   • Meter is released upon proper installation. CCS is contacted for all irrigation & commercial meter sets by CP&D for Cross Connection Inspection prior to setting meter & turning on water.
   • Assembly is tested by City Of Olympia CCS.
   • Inspection is signed off.

6. What to do if assembly is not correct:
   • Contact inspector or contractor.
   • Turn off & lock off service.
   • Inform Water Shop & Utility Billing so meter does not get set until correction has been completed.
   • When in doubt take pictures.

7. Documentation:
   • Record assembly information such as Make, Model, Serial#, Size, Location and Hazard.
   • Date & Time.
   • Contact Person or Company.
   • Note any discrepancies.
8. **New Construction:**
   - All new main construction over 20 feet in length requires a double check valve to fill & flush. This backflow assembly shall pass the certification test (certification test is initial backflow assembly test using Washington State Testing Procedures done by City Of Olympia CCS or certified private tester if CCS is not readily available) prior to use and shall remain in place if inline with the new main until a passing bacteriological test is confirmed by the testing lab.
   - Exemptions to this requirement must be made by the City Of Olympia CCS such as length of pipe is close to 20’ or circumstances don’t allow the installation of a backflow assembly)
   - No new main shall be accepted for use without a passing bacteriological test from an approved laboratory.
SOP # 27 Determining Unauthorized Connections to Reclaimed Water

Note: Only City Of Olympia Certified Cross Connection Specialist (CCS) is authorized to assess reclaimed water sites.

References:
- Ordinance 6321, City of Olympia Engineering Design & Development Standards Chapters 6 and 10
- Cross Connection Control Level of Protection SOP # 20

1. A site to receive reclaimed water shall be inspected prior to service connection to determine the location of potable water uses, the number of potable services to site and the complexity of plumbing on site.

2. Record in writing and photograph, if necessary, any and all “possible” connection locations for reclaimed and potable water on the entire site to receive reclaimed water.

3. Document all potable water hose bibs, drinking fountains, playground equipment, or anything that could possibly receive overspray from the reclaimed water system.

4. To determine if there are any connections to the potable water system at sites where there is reclaimed water:
   - Contact LOTT and find out what their water quality results are that morning for conductivity, chlorine residual and nitrate.
   - Collect a water sample from the potable water system and field test it for conductivity, chlorine residual and nitrate (typically conductivity will be less than 110 m-ohms/cm, chlorine residual around 0.8 mg/L and nitrate non-detect).
   - Compare the results from both water systems.
   - If the results are similar, a cross connection is suspected so proceed with the shut down test below.

5. Shut down test
   - Shut the supply to the reclaimed water off.
   - Drain reclaimed water system.
   - Isolate reclaimed water system at source leaving all downstream valves on.
   - Leave potable water system on.
   - Connect pressure gauge to reclaimed water system.
Appendix C – Standard Operating Procedures Associated Cross Connection Control

- Leave reclaimed system off for 30 minutes and watch gauge to see if pressure increases.
- Should pressure increase in reclaimed system shut down all water sources to site.
- Inspect for cross connection(s) between potable & reclaimed water systems.

6. To determine if there are any connections to the reclaimed water system from the potable water system.
   - Shut off supply to potable water system.
   - Drain pressure off potable water system.
   - Isolate potable water system leaving all downstream valves open.
   - Leave reclaimed water system on.
   - Connect pressure gauge downstream of Reduced Pressure Backflow Assembly located on potable water system.
   - Leave reclaimed system on & potable water system off for 30 minutes (if possible) and watch pressure gauge.
   - Should pressure increase in potable water system shut down all water sources to site.
   - Inspect site for cross connection(s) between potable & reclaimed water systems.

7. Should any cross connections be found refer to Water Quality SOP #20 titled Cross Connection Control Level of Protection.

8. Sites with reclaimed water plumbed to them will automatically be required to install a Reduced Pressure Backflow Assembly as close to the domestic water meter as possible. There shall be no connection between the water meter and the backflow assembly. This work will need to be done prior to any reclaimed water use.

9. Pressure testing of sites with reclaimed water shall mean testing both inside and outside of any building on the affected site to be sure there are no cross connections or possibility of reclaimed water contaminating the potable water system.

10. All signage and exposed reclaimed water piping labels shall be properly installed prior to reclaimed water use. Also all requirements must be met in Reclaimed Water Standards especially in section 10.24 (Submittals) prior to use.

11. Documentation of all pressure testing for any site using reclaimed water and potable water shall be detailed and kept with the City Of Olympia CCS and Water Quality Supervisor.
Appendix C – Standard Operating Procedures Associated Cross Connection Control

SOP # 29 INSPECTION AND TESTING OF BACKFLOW ASSEMBLIES OF WATER SERVICES WITH RECLAIMED WATER

Note: Backflow assemblies are inspected and tested at their initial installation and annually thereafter.

Equipment list:
- 5-valve differential pressure test kit specifically designated for reclaimed water use
- Backflow assembly test report

1. Customer receives written notification of annual testing.
2. Inspect assembly to determine the condition of fittings.
3. Observe whether leakage is occurring and that assembly continues to be in an acceptable condition and appropriate for site.
4. Turn off water, meanwhile observing assembly to ensure there is no leakage.
5. Flush test cocks in order specified:
   - Open and leave open TC #4, TC#3, TC, #2, and TC #1.
   - Then close TC #1, TC #2, TC #3, and TC #4.
   - Install appropriate fittings to test and cocks if needed.
6. Connect test kit:
   - High side hose to test cock #2.
   - Low side hose to test cock #3.
   - Close all test kit valves.
7. Purge:
   - Open TC #3.
   - Open low bleed valve (leave it open).
   - Open TC #2 slowly.
   - Open high bleed valve (leave it open).
8. Isolate:
   - Close shut-off valve #2 to isolate.
   - Close high bleed valve after the air is gone.
   - Close low bleed valve after needle on gauge reaches upper limits.
   - Record the apparent static pressure drop across CV #1.
9. Test operation of differential relief valve and increase zone pressure:
   - Open high control valve.
   - Open low control valve maximum of one-quarter (¼) turn.
   - Place hand under relief valve vent.
   - Record differential pressure in pounds per square inch (psid) at first drip.
   - Close low control valve.
10. Test check valve #2 and increase downstream pressure:
Appendix C – Standard Operating Procedures Associated Cross Connection Control

- Purge vent hose, connect to TC #4.
- Open and close low bleed valve to reestablish differential.
- Open vent control valve and wait for gauge needle to stabilize.
- Record status (closed tight or leaked).
  Note: Leave the vent valve open.

11. Test check valve #1 and reestablish differential:
- Open and close low bleed valve to reestablish differential
- Record psid across #1 check valve.

12. Return to service.
- Close all test cocks.
- Slowly open shut-off valve #2.
- Remove all test equipment.

14. Fill out test report in an accurate and legible manner.
15. If assembly does not pass inspection, customer will be notified of results and a follow-up inspection will be required after repairs.
Appendix C – Standard Operating Procedures Associated Cross Connection Control

SOP # 30 INSPECTION OF POTENTIAL SITES FOR RECLAIMED WATER SERVICE

Equipment list:
- City of Olympia Correction Notice Form – see attached

1. Identify the site to receive reclaimed water and the approved type of use of reclaimed water. City will receive notification of site through application for reclaimed water service through Community, Planning and Development.
2. Schedule an inspection with the site owner/manager if there are buildings present on site.
3. Trace and locate all plumbing on site, including plumbing located inside buildings. Record any deficiencies such as cross-connections or possible hazards.
4. Complete write-up of hazards found and corrections needed.
5. Schedule time to explain information to customer if needed.
6. Follow-up inspection of any possible installations and testing if needed.
7. Turn reclaimed water on once proper backflow is installed and tested by City of Olympia using Water Quality SOP #29 titled Inspection and Testing of Backflow Assemblies on Reclaimed Water.
City of Olympia
PO Box 1967
Olympia, WA 98507-1967

Call 753-8161 when completed

CORRECTION NOTICE

Project/Building Name: ____________________________ Date: ____________
Address: ____________________________ File #: ____________

The following items need completion or correction before acceptance of the project can be
given by the City of Olympia, Public Works, Water Section:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Received by ____________________________ Issued by ____________________________

Date Reinspected: ____________ By: __________________ Items corrected: ____________

Remarks:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Distribution:
WHITE – Inspection site
CANARY – Water Section files
PINK - Recall

CITY OF OLYMPIA
BACKFLOW PREVENTION ASSEMBLY TEST REPORT FORM

Name of Business or Property Owner: ________________________________
Address: _______________________________________________________
Device Location: _________________________________________________
Cross Connection Hazard: _________________________________________

DEVELOPMENT AND SIZE
Size: ___________________________________________________________
Manufacturer: ___________________________________________________
Serial Number: _________________________________________________
Model Number: _________________________________________________

Does the assembly meet the City of Olympia’s installation requirements? Yes ☐ No ☐
Comments: _____________________________________________________

REDUCED PRESSURE PRINCIPLE ASSEMBLY

<table>
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<tr>
<th>Double Check Valve Assembly</th>
<th>Relief Valve</th>
<th>PVB/SVB</th>
</tr>
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</table>
| Check Valve #1 | Check Valve #2 | Did not open ☐ | Air inlet
Leaked ☐ | Held at ____ PSID
Leaked ☐ | Opened at ____ PSID
Opened fully Y ☐ N ☐ |

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<tr>
<th>Initial Test</th>
<th>Repairs</th>
<th>Final Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Held at ____ PSID</td>
<td>Held at ____ PSID</td>
<td>Held at ____ PSID</td>
</tr>
<tr>
<td>Leaked ☐</td>
<td>Leaked ☐</td>
<td>Did not open ☐</td>
</tr>
<tr>
<td>Cleaned ☐</td>
<td>Cleaned ☐</td>
<td>Cleaned ☐</td>
</tr>
<tr>
<td>Replaced ☐</td>
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<tr>
<td>Comments:</td>
<td>Comments:</td>
<td>Comments:</td>
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</table>

TEST EQUIPMENT

<table>
<thead>
<tr>
<th>Gauge</th>
<th>Make</th>
<th>Model</th>
<th>Serial Number</th>
<th>Verification Date</th>
</tr>
</thead>
</table>

OTHER

Line pressure: ____________________________
Meter reading: ___________________________
Relief valve exercised: __________________

Did the assembly pass the test using Washington State approved test procedures? Yes ☐ No ☐

<table>
<thead>
<tr>
<th>Date</th>
<th>Print Name</th>
<th>Signature</th>
<th>Tester #</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initial Test

Repairs

Final Test
Appendix E – City of Olympia Backflow Incident Form

City of Olympia
Backflow Incident Report Form

Report Date: ___________________  Reported By: ___________________

Date of Incident: ______________  Time of Incident: ______________

General Location: ________________________________________________

**Backflow Originated From:**

Name of Premise: ____________________________

Street Address: _____________________________ Contact Person: __________

Type of Business: __________________________

**Description of Contaminant (attach MSDS or sample results if available):**

____________________________________________________________________

**Distribution of Contaminant:**

Number of persons affected: __________________ Pressure Zone: _____________

Contained within customer’s premise: Yes: _____ No: _____ Unsure: _____

**Effect of Contamination:**

Illness Reported: _____________________________

Results of Physician: _________________________

Symptoms Reported: _________________________

**Source of Contamination (irrigation system, pump, etc):**

____________________________________________________________________

**Cause of Backflow (backsiphonage, backpressure):**

____________________________________________________________________

**Corrective Action Taken:**

Water Service Terminated: Yes: _____ No: _____
Appendix E – City of Olympia Backflow Incident Form

Meter Pulled: __________  Service Disconnected: __________

Flushed Main: __________  Length of Flushing Time: __________

Disinfection: ________________________________________________

Comments: ________________________________________________

Corrective Action Ordered to Eliminate of Protect Cross Connection:

________________________________________________________________________________________________________________

Previous Cross Connection Survey of Premises:

Date: ___________________________  Inspected By: ___________________________

Type of Backflow Preventer Isolating Premises:

RPBA: ___  RPDA: ___  DCVA: ___  DCDA: ___

Type of Internal Premises Backflow Preventer:

RPBA: ___  RPDA: ___  DCVA: ___  DCDA: ___  PVBA: ___  AVB: ___

Air Gap: ___  None: ___

Date of Last Test of Assembly:

Tested By: ___________________________  Cert No.: __________  Date: ___________________________

Notification to Washington State Department of Health:

Date: ________________  Time: ________________  Person Notified: ___________________________

Notified By: ________________________________________________

Other Entities Notified:

________________________________________________________________________________________________________________