

# ***Cross-Connection Control Program***

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## **INTRODUCTION**

A cross-connection control (CCC) program is a proactive and ongoing effort of a water purveyor to protect the health of its customers by preventing contamination and pollution of the municipal water supply through cross-connection. A cross-connection is any physical connection, actual or potential, between a water system and any source of non-potable substance. All public water systems in Washington State are required to implement a CCC program. The purpose of a purveyor's CCC program shall be to protect the public water system from contamination via cross-connections. All required elements of a local CCC program must be documented and included in either the Comprehensive Water System Plan (applicable to the City of Kirkland (City)) or Small Water System Management Program document (not applicable to the City). Although general CCC rules have been in effect for over 20 years, the State mandate for the CCC program and the required elements of the CCC program are contained in WAC 246-290-490, Cross-Connection Control, which became effective in April 1999. The following are the minimum required elements of a CCC program.

- Adopt a local ordinance, resolution or code that establishes the purveyor's legal authority, describes operating policies and the corrective actions of a CCC program.
- Develop and implement procedures and schedules for evaluating new and existing service connections to assess hazards.
- Develop and implement procedures and schedules that eliminate or control cross-connections and ensure approved backflow preventers are properly installed.
- Ensure that personnel, including one certified Cross-Connection Control Specialist (CCS), are provided to develop and implement the CCC program.
- Develop and implement procedures to ensure approved backflow preventers are properly inspected and tested.
- Develop and implement a backflow prevention assembly testing quality control assurance program.
- Develop and implement procedures for backflow incident response.
- Include CCC program information in customer education materials.
- Develop and maintain CCC program records.
- Meet any additional CCC requirements if reclaimed water is distributed or received in the water service area.

## **PURPOSE AND SCOPE**

This document establishes the minimum standards for the City to protect the public water supply from possible contamination from backflow. This document also describes minimum CCC program operating policies, and provides guidelines for installation, testing and maintenance of approved backflow assemblies. In addition, permitting and inspection requirements for existing and new backflow prevention assemblies are described. The document concludes with recommendations that the City is advised to address in order to comply with the updated CCC program requirements.

## **AUTHORITY**

The Federal Safe Drinking Water Act of 1974 and the statutes of the State of Washington Title 43 RCW require purveyors to protect the public water systems from contamination. In addition, WAC 246-290-490 establishes CCC program requirements for the State. In Washington State, the Department of Health (DOH) is the lead agency for the development and administration of the State's CCC program. The City adopted the 2003 Uniform Plumbing Code (UPC) and its Washington State amendments with Kirkland Municipal Code (City Code) 21.24.010. The 2003 UPC contains cross connection control requirements, by adopting the UPC, the City adopted these CCC elements.

## **RESPONSIBILITY**

The City is responsible for protecting its public water supply from contamination due to backflow of pollutants through water service connections. If the City determines that a backflow prevention assembly is necessary at a customer's premise, the City will notify the customer to install an approved backflow assembly. Installation of said backflow assembly shall be a condition of continued water service from the City. Upon installation, the customer shall arrange for inspection and testing of said assembly. The customer will be responsible for all applicable testing and inspection fees.

## **FAILURE TO COMPLY**

Any person, firm or corporation who violates any of the provisions of this document or future CCC resolutions may be punished in accordance with the City Code. Any person, firm or corporation who violates any provisions and requirements of this document shall be subject to the discontinuance of supply of City water to its premise. Discontinuance of the City's potable supply to the premise shall remain in effect until corrective action, as required by the City, is completed, tested and approved.

## **CROSS-CONNECTION CONTROL PROGRAM**

The City has implemented some of the required elements of the CCC program as listed above. This document will describe the City's current CCC program and will also discuss areas that the City needs to address in order to comply with the CCC program requirements. The City is committed to protecting the public water supply from contamination by eliminating potential cross-connections.

The City's CCC program that follows includes a statement of its goals and objectives, the evaluation of CCC elements, the program implementation schedule and recommendations.

### ***CCC Program Goals and Objectives***

The goals and objectives of the City's CCC Program consist of:

- Preventing contamination or pollution of the public water supply by eliminating or properly protecting actual or potential cross-connection;
- Taking inventory of all potential cross-connections; and
- Maintaining the inspection and testing program for all backflow prevention assemblies. Inspections shall include backflow prevention assembly installations, annual inspections of air gaps and annual surveys of high-hazard facilities. The City will notify customers when testing is due.

The City will achieve these goals and objectives through the implementation of the CCC program that follows.

### ***Evaluation of CCC Program Elements***

The City is required to develop and implement a CCC program. All required elements of a local CCC program must be documented and included in the City's Comprehensive Water System Plan. The evaluation of the CCC program elements and current level of implementation are presented below.

### **Cross-Connection Control Resolution**

CCC resolution requires that the purveyor "adopt a local ordinance, resolution, code, bylaw, or other written legal instrument" outlining the purveyor's program. In addition, this document must establish the purveyor's legal authority to implement a CCC program. Operating policies, technical provisions and corrective actions of the CCC program must also be addressed in the legal document. The City adopted a formal CCC program with Section 21.24.010 of the Kirkland Municipal Code. This document updates the City's CCC program in order to comply with the WAC 246-290 requirements.

*The City has adopted a CCC resolution, with City Code 21.24.010 that establishes the City's authority in implementing a cross-connection program. The City will update the resolution in 2013 to address the regulation in WAC 246-290 and the current CCC program contained in this document.*

### **Evaluation of Service Connections**

Purveyors must develop and implement procedures for evaluating new and existing service connections to assess the risk of connecting the consumer's premises to the City's public water system. Purveyors are required to notify the consumer within a reasonable time frame of the evaluation results. New connections are required to be evaluated prior to service. Existing connections shall be inspected on a schedule acceptable to the DOH.

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The City has an established procedure for evaluating new service connections for potential cross-connection. This risk assessment evaluation is performed during the building permit or utility service agreement application review process for new water service applicants. Existing customers are evaluated during the building permit review process for structure alterations or additions and during the business license review process. If a backflow assembly is required as a result of this evaluation, the assembly, owner's name, property address, and other pertinent information is recorded in a database that is maintained by the City. The City has developed and implemented an evaluation program that assesses the risk of existing water service connections. Potential high-risk cross-connection premises are evaluated first. The City will then evaluate other premises, based on potential risk to the water system and budget availability. The evaluation program for existing connections was implemented in 2007.

**Table 1** lists standard abbreviations for backflow prevention assemblies. These abbreviations will be used in the tables that follow.

**Table 1  
Abbreviations**

Abbreviation	Description	Level of Protection
AG	Air Gap	1
RPBA	Reduced Pressure Backflow Assembly	2
RPDA	Reduced Pressure Detector Assembly	2
DCVA	Double Check Valve Assembly	3
DCDA	Double Check Detector Assembly	3
PVBA	Pressure Vacuum Breaker Assembly	4
AVB	Atmospheric Vacuum Breaker	5
SVB	Spill Resistant Vacuum Beaker	5

**Table 2** lists the premises that are required to have isolation by an air gap or reduced pressure backflow assembly to prevent contamination to the public water system. **Table 3** shows various facilities that require or recommend backflow prevention devices.

**Table 2  
Premises Requiring Mandatory Service Isolation by AG or RPBA**

Premises	Premises
Agricultural (farms and dairies)	Mortuaries
Beverage Bottling Plants	Nursing Homes
Car Washes	Petroleum Processing or Storage Plants
Chemical Plants	Piers and Docks
Commercial Laundries	Radioactive Material Processing Plants
Premises with Potable and Reclaimed Water	Nuclear Reactors
Film Processing Facilities	Survey Access Denied or Restricted
Food Processing Plants	Wastewater Lift Stations
Hospitals and Medical Centers	Wastewater Treatment Plants
Laboratories	Unapproved Auxiliary Supply
Metal Plating Industries	

Currently, the City requires RPBA's at industrial facilities, DCVAs at commercial facilities, DCVAs at multi-family buildings greater than or equal to three stories, and DCVAs or AVBs for irrigation and DCVAs for fire sprinkler systems.

**Table 3  
Backflow Protection Requirements and Recommendations**

Required Service Isolation
Premises with Approved Auxiliary Supply
Premises with Fire Sprinkler Systems or Private Hydrants
Tall Buildings (Over 30 feet)
Recommended Service Isolation
Mobile Home Parks
Shopping Centers

**Table 4** lists fixtures, equipment and areas that have the potential to contaminate the public drinking water system. The table also shows the minimum protection required by the City to prevent such contamination.

**Table 4  
Fixtures, Equipment and Areas with Backflow Potential**

<b>Fixtures, Equipment and Areas</b>	<b>Protection</b>	<b>Fixtures, Equipment Areas</b>	<b>Protection</b>
Air Compressors	DCVA	Janitor Sinks	AVB
Air Conditioning Systems	RPBA	Kitchen Equipment	AVB
Air Washers	RPBA	Laboratory Equipment	RPBA
Aquarium Make-Up Water	AG/RPBA	Laundry Machines, Commercial	RPBA
Aspirators, Medical	AVB	Lavatories	AVB
Aspirators, Vault Drain	RPBA	Livestock Drinking Tanks	DCVA
Aspirators, Weedicide/Herbicide/Pesticide	RPBA	Make-Up Tanks	AG/RPBA
Autoclaves	RPBA	Mobile Carpet Cleaners	RPBA
Autopsy Tables	RPBA	Mop Sinks	AVB
Baptismal Fountain	RPBA,AG/AVB	Outboard Motor Test Tanks	AG/RPBA
Bathtub, Below Rim Filler	Not Allowed	Perchlorethylene Reclaim	AG/RPBA
Bedpan Washers	RPBA	Pesticide Applicator Trucks	AG/RPBA
Beverage Dispensers using CO2	RPBA	Photo Developing Tanks and Sinks	RPBA
Bidets	AVB/AG-Internal	Photostat Equipment	RPBA
Boat Lifts	RPBA	Pipette Washers	AVB
Boiler Feed Lines	AG/RPBA	Potato Peelers	AVB
Bottle Washing Equipment	RPBA	Poultry Feeders	RPBA
Box Hydrants	DCVA	Private Hydrants	DCVA
Brine Tanks	AG/DCVA	Processing Tanks	AG/RPBA
Can Washing Equipment	RPBA	Pump Seal Water	AG/RPBA
Chemical Feeder Tanks	AG/RPBA	Pumps, Pneumatic Ejector	RPBA
Chilled Water Systems	RPBA	Pump Prime Lines	RPBA/DCVA
Chlorinators	RPBA	Pumps, Water Operated Ejector	RPBA
Coffee Urns	AG/AVB	Radiator Flushing Equipment	RPBA
Computer Cooling Lines	AG/RPBA	Recreational Vehicle Dump Stations	RPBA
Condensate Tanks	AG/RPBA	Serrated Faucets	AVB
Cooking Kettles	AG/AVB	Service Sinks	AVB
Cooling Towers	AG/RPBA	Sewer Connected Equipment	AG
Decorative Ponds	AG/RPBA	Sewer Flushing	AG
Degreasing Equipment	RPBA	Shampoo Basins/Hose Rinse	AVB
Demineralized Water System	RPBA	Showers, Telephone	AVB
Dental Cuspidors	RPBA	Sitz Baths	AVB
Detergent Dispensers (Dishwasher)	AVB	Soap Mixing Tanks	AG/RPBA
Dialysis Equipment	RPBA	Solar Heating Systems	RPBA
Dishwashers	AVB	Solution Tanks	AG/RPBA
Drinking Fountains	AG	Spas	AG/RPBA
Dye Vats and Tanks	AG/RPBA	Specimen Tanks	AG/RPBA
Dynamometers	DCVA	Starch Tanks	AG/RPBA
Emergency Generators	RPBA	Stream-Air Sprays	RPBA
Etching Tanks	AG/RPBA	Steam Cleaners	RPBA
Fermenting Tanks	AG/RPBA	Steam Ejectors	RPBA
Fertilizer Injection Equipment	RPBA	Steam Generating Facilities	RPBA
Film Processors	RPBA	Sterilizers	RPBA
Fire Department Connections w/o chemicals	DCVA/DCDA	Stills	RPBA
Fire Department Connections with chemicals	RPBA/RPDA	Sumps	AG
Fire Sprinkler Systems w/o chemicals	DCVA/DCDA	Swimming Pools	AG/RPBA
Fire Sprinkler Systems with chemicals	RPBA/RPDA	Toilets (Internal)	AG
Floor Drains	AG	Trap Primers	AG
Flushing Floor Drains	AVB	Ultrasonic Baths	AG
Foamite Systems	RPBA/RPDA	Urinals (Internal)	AG
Fountains, Ornamental	AG/RPBA	Used Water Systems	RPBA
Fume Hoods	RPBA	Vats	AG/RPBA

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**Table 4 (Continued)  
Fixtures, Equipment and Areas with Backflow Potential**

<i>Table Continued</i>			
Garbage Can Washers	RPBA	Washing Pools	AG/RPBA
Garbage Disposals	RPBA	Wall Hydrants	AVB
Heat Exchangers	RPBA	Wash Basins	AG/AVB
Heat Pumps	RPBA	Wash-Up Sinks	AG/AVB
High Pressure Washers w/o chemicals	DCVA	Wash Tanks	AG/RPBA
High Pressure Washers with chemicals	RPBA	Wastewater Lines	AG
Hose Bibs	AVB	Water-Air Sprays	DCVA
Hoses, Kitchen Rinse	AVB	Water Closets (Internal)	AG
Hot Tubs	AG/RPBA	Water Cooled Equipment	RPBA
Hot Water Heating Systems	RPBA	Water Ejectors	RPBA
Hot Water Boilers	RPBA	Water Recirculating Systems	DCVA
Humidifier Tanks and Boxes	AG	Water Settling	RPBA
Hydraulically Operated Equipment	RPBA	Water Treatment Tanks	AG/RPBA
Hydrotherapy Baths	RPBA	Water Trucks	AG/DCVA
Ice Makers	RPBA	Wet Vacuum Systems	RPBA
Industrial Fluid Systems	RPBA	Whirlpool Baths	AVB/DCVA
Interties (Looped) Water Systems	DCVA	Windshield Washer Fluid Aspirators	RPBA
Irrigation Systems w/o chemicals	DCVA	X-Ray Processors	RPBA
Irrigation Systems with chemicals	RPBA	Yard Hydrants	RPBA

**Table 5** summarizes the number of each type of backflow prevention assembly protecting the distribution system as of March 2012.

**Table 5  
Summary of Backflow Prevention Assemblies**

Type of Device	Quantity
AG	0
RPBA	546
RPDA	0
DCVA	2734
DCDA	13
PVBA	6
AVB	0
SVB	6
Other	10

**Cross-Connection Control and Elimination**

Purveyors are required to eliminate existing cross-connections wherever possible. If elimination is not possible, then approved backflow prevention assemblies should be installed properly by a certified CCC specialist to reduce the risk of contamination in each of the following circumstances.

- If the nature and extent of any activity on the premises, the material used in connection with any activity on the premises, or the materials stored on the premises, could contaminate or pollute the drinking water supply in any way.
- On premises having one or more cross-connections.
- Internal cross-connections that are not correctable, or intricate plumbing arrangements that make it impractical to ascertain whether or not cross-connections exist.
- A repeated history of cross-connections being established or re-established.
- Unduly restricted entry so that inspections for cross-connections cannot be made with sufficient frequency or with sufficient notice to assure that cross-connections do not exist.
- Materials of a toxic or hazardous nature being used such that, if back siphoning should occur, a health hazard could result.
- Any mobile apparatus which uses water from the system or water from any premises within the system service boundaries.
- Any irrigation system.
- Any fire service and/or fire sprinkler.
- All new construction, remodels, commercial, business, industrial and private homes shall be evaluated to determine the necessity of an approved assembly.
- On any premise where installation of an approved assembly is deemed to be necessary to accomplish the purpose of these regulations in the City's judgment.
- On any premise where an appropriate cross-connection report has not been filed with the City.

*The City will endeavor to eliminate cross-connection where possible. In addition, owners shall be responsible for the elimination or protection of all cross-connections on their premises. The City will continue to maintain an inventory of existing backflow assemblies that it currently operates, maintain, and inspects. A separate inventory will include all assemblies on customers' premises that are the responsibility of the customer to maintain. The City will keep these inventories on file at the administrative offices, and shall update the inventory as necessary.*

*The City shall continue to eliminate potential cross-connections at existing facilities and require installation of backflow assemblies at all premises deemed to be "high-risk," such as water service connections at sewage facilities. Once potential "high-risk" cross-connections are eliminated, the City will concentrate its efforts on reducing potential medium- and low-risk cross-connections.*

### **Installation Requirements**

To ensure proper operation and accessibility of all approved assemblies, the following requirements shall apply to the installation of these devices.

- No part of the approved assembly shall be submerged under water or installed on a location subject to flooding. If installed in a vault or basement, adequate drainage shall be provided.
- Approved assemblies must be installed at the point of use. Alternate locations must be approved in writing by the City prior to installation.
- The approved assembly must be protected from freezing and other severe weather conditions.



## **Cross-Connection Control Program**

- All approved assemblies installed shall be of a type and model pre-approved by the DOH and the City.
- The approved assembly shall be readily accessible with adequate room for maintenance and testing. Approved assemblies 2 inches and smaller shall have a minimum clearance of 6 inches on all sides of the device. Approved assemblies larger than 2 inches shall have a minimum clearance of 12 inches on the back side, 24 inches on the test cock side, 12 inches plus the nominal size of the assembly below the device and 36 inches above the assembly.
- If the approved assembly is installed inside a building, the assembly shall be readily accessible at all times and an emergency after hours contact phone number and person shall be provided to the City.
- If the approved assembly is installed inside a building and it is installed 5 feet above the floor, it must be equipped with rigidly and permanently installed scaffolding acceptable to the City. This installation must also meet the requirements set forth by the U.S. Occupational Safety and Health Administration and the State of Washington Occupational Safety and Health Codes.
- Reduced pressure principle assemblies may be installed in a vault only if the relief valve discharge can be drained to daylight through a “boresight” type drain. The drain shall be of adequate capacity to carry the full rated flow of the assembly and shall be screened at both ends. An approved air gap shall be located at the relief valve orifice. This air gap shall be at least twice the inside diameter of the incoming supply line as measured vertically above the top rim of the drain and in no case less than 1 inch.
- Where an approved assembly is deemed necessary, the model of the assembly and installation plans shall be submitted to the City for approval prior to installation.
- Upon completion of the installation, the City shall be notified and an inspection will occur for approval of the installation. All approved assemblies must be registered with the City. Registration shall consist of installation, make, model and serial number of the assembly, and an initial test report.
- If any user refuses access to a premise, or to the interior of a structure, at reasonable times and with reasonable notice for inspection by the City, an RPBA will be required to be installed at the service connection to that premise.

Any variances from these installation requirements shall be requested in writing by the owner and must be approved by the City prior to installation.

*The City will continue to enforce these installation requirements.*

### **Personnel Certification**

WAC 246-290-490 requires that personnel, including one certified Cross-Connection Control Specialist (CCS), are provided by the purveyor to develop and implement a CCC program. **Table 6** shows the City’s personnel certifications. Mr. Steve Ensminger and Ms. Karla Holmes are both certified as Cross-Connection Control Specialists.

*The City has the properly certified staff to implement and maintain a CCC program as outlined by the State. The City will continue to provide properly certified personnel to implement the CCC program.*

**Table 6  
Personnel Certification**

Name	Position	Certificate Number	Certification
Greg Neumann	Water Division Manager	10754	WDM-3
Steve Ensminger	Water Division Lead	5057	WDM-2, CCS, Asbestos Abatement
Joe Brown	Senior Maintenance Worker	6320	WDS-2
Steve Hoopes	Senior Maintenance Worker	N/C	N/C
Karla Holmes	Utility Craftsperson	4914	WDM-1, CCS
Gianni Mallamo	Utility Craftsperson - Meter Reader	N/C	N/C
Trevor Kirschenmann	Utility Worker	N/C	N/C
Jesse Byrd	Utility Worker	N/C	N/C
Gary Chase	Utility Worker	N/C	N/C
Duane Thress	Utility Worker	N/C	N/C
Kim Blackketter	Utility Worker	9526	WDM-1

**Certification Definitions**  
WDM - Water Distribution Manager  
WDS - Water Distribution Specialist  
CCS - Cross Connection Control Specialist  
N/C - None Currently

**Backflow Assembly Inspection and Testing**

The DOH requires that all backflow assemblies are routinely inspected and tested by certified personnel. Inspections are required at the time of installation, annually thereafter, after a backflow incident, and/or after the assembly is repaired, reinstalled or relocated. All assemblies found functioning improperly shall be promptly repaired or replaced by the owner. If any such assembly is not promptly repaired or replaced, the City may deny or discontinue service to the premise.

*The City is responsible for administering those assemblies that are installed on the public water distribution system, not including those assemblies installed after a meter on private premises. For assemblies installed on customers' premises, the customer shall arrange for testing of said assemblies by a backflow prevention assembly tester approved by the City. The City will notify customers annually of required testing and the testing must be completed before a corrective action date passes. The customer will be subject to all applicable testing, maintenance and repair fees. On new installations, the City will: (1) provide on-site evaluation and/or inspection of plans in order to determine the type of backflow assembly, if any, that will be required; and (2) require certification of proper installation by an approved inspector prior to providing water service. For existing premises the City will perform evaluations and inspections of plans and/or premises and inform owners by letter of any corrective action deemed necessary, the method of achieving the*

## **Cross-Connection Control Program**

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*correction and the time allowed for the correction to be made. Ordinarily, corrections must be made within 60 days; however, the City may adjust this time period depending on the degree of hazard involved and the history of the assembly in question. Service may be discontinued immediately if necessary. The City will then inspect the premises on or after the expiration date of the required action to correct a cross-connection. If the premise is found to be in non-compliance with the City's request, the owner shall receive written notice that water service to the premises will be discontinued. If the owner informs the City of extenuating circumstances as to why the correction has not been completed within five working days of receipt of the notice of termination, the City may grant a time extension.*

*Inspection and testing of assemblies shall be done: (1) during the initial installation; (2) during on-site reviews of existing installations; (3) after any repairs or maintenance; (4) after any relocation; and (5) on an annual basis, but may be required more frequently for certain high hazard premises. When an initial installation or annual test indicates that a backflow assembly is not functioning properly, the owner shall correct the malfunction within five working days as directed by the City. After correcting the problem, the owner shall arrange for re-inspecting and testing of the assembly.*

*The owner shall be responsible for the payment of all fees: (1) for annual or semi-annual assembly inspection/testing; (2) for re-testing if the assembly fails to operate correctly; and (3) for any re-inspections for non-compliance with City requirements. The City inspects each cross-connection control device under City control annually, and will continue to maintain records of backflow assembly inspections. All cross-connection control devices under City control comply with the City's requirements.*

### **Testing Quality Control Assurance Program**

Development and implementation of a quality control assurance program for the testing of backflow prevention assemblies is required. Successful implementation of this program element assures that all backflow prevention assemblies are tested in a similar manner and kept in optimal condition.

*The City shall ensure that all testing procedures are completed in a consistent manner. Only certified personnel shall be utilized to test all backflow assemblies. The City has a process for approving backflow assembly testers and only testers appearing on the City's approved list may be used for testing and repair. Personnel shall be trained as outlined by the State, fulfilling all necessary requirements in order to comply with WAC 246-290-490.*

*Testing shall be recorded on the proper forms and maintained at the administrative offices. Examples of testing forms can be found in the AWWA "Recommended Practice for Backflow Prevention and Cross-Connection Control" manual. In the future, the City will provide forms to their customers with the annual testing notification.*

*Testing personnel shall adhere to the following steps: (1) use only properly operating and calibrated gauge equipment; (2) follow proper field test procedures; (3) consult the manufacturer's repair and maintenance manual when disassembly is required; (4) use only original manufacturer spare parts; and (5) retest the backflow assembly immediately after repair or maintenance. Testers can only perform tests and repairs allowed by the Washington State Backflow Assembly Tester certification; all other repairs and installations require a Specialty Plumber's License. All persons performing tests, repairs or installations shall have all required certifications and licenses and shall furnish the City with copies upon request.*

*In addition to the above steps, testing procedures performed by certified test personnel shall be in compliance with current test procedures approved by the DOH, the AWWA yellow manual or the USCS manual, which may include the following: (1) advise customer of an impending test/inspection so that the customer's staff may participate; (2)*

*notify the fire department when shut down of a fire service is necessary; (3) flush residual dirt through test cocks before attaching test gauges; (4) ensure that the high and low pressure bypass hoses of the test kit are connected to the proper test cocks; open test cocks slowly when bleeding air through the bypass hoses; (5) test gauges shall be properly calibrated by a certified testing agency; and (6) assemblies should be tested before the warranty expiration date.*

### **Incident Response**

Purveyors are required to develop a backflow incident response plan. The following paragraph outlines the City's response to a backflow incident. Other emergency response procedures are included in the City of Kirkland Emergency Response Plan.

### **Emergency Condition: Water System Contamination and Pollution Due to a Backflow Incident**

*Impact on System:* Potentially major impact. Water not suitable for potable use – loss of supply. Potential irreversible damage to water mains and pipes.

#### *Emergency Response*

1. Shut down the affected mains (if possible) to contain the affected contaminants.
2. Notify the Water Division Manager.
3. Notify the DOH of the backflow incident.
4. Notify all customers of the problem and instruct them to boil all water to be used for consumption and cooking or issue a no-drinking warning.
5. Flush affected water mains to remove contaminants.
6. Disinfect storage tanks and water mains, as necessary, to remove contaminated residuals.
7. Analyze water quality in other parts of the distribution system to ensure that all contaminants were contained.

*This document (and the City of Kirkland Emergency Response Plan) outlines procedures to be followed if an emergency arises. When a CCC emergency is called into the City of Kirkland Police Department, or other emergency responder during non-business hours, the responder will notify the City's on-call person. This person assesses the emergency and will notify any City personnel as deemed necessary, depending on the severity of the emergency. All emergencies are reported to Mr. Greg Neumann, Water Division Manager. This person will be responsible for coordinating with City personnel, as well as other emergency responders, if necessary.*

### **Public Education**

Another CCC program requirement is that educational information of the CCC program be included in existing water system materials that are distributed to customers. Educational materials can be included in pamphlets, brochures, bill inserts, public service announcements and consumer confidence reports.

*The City will develop CCC program education materials and will include them in bill inserts and City-wide newsletters.*

### **Record Keeping**

Purveyors must also develop and maintain records of their CCC program, as mandated by the DOH. At a minimum, purveyors must maintain the following records.

- Master list of service connections and/or premises where backflow prevention assemblies are protecting the public water system or fixtures.
- Assessed hazard level of each backflow assembly.
- Inventory information on approved air gaps, including location, degree of hazard, installation date, inspection history, inspection results and personnel conducting inspections.
- Backflow assembly inventory information, including location, assembly description, installation date, inspection history, test and repair history, test results and inspecting personnel.
- Atmospheric vacuum breaker (AVB) and spill resistant vacuum beaker (SRVB) inventory, including location, description, installation date, inspection history and inspecting personnel.
- Program summary and backflow incident reports.

*The City will continue to keep records as required by the CCC program. At a minimum, the City will maintain the following information: (1) installation date of assemblies; (2) location of backflow assemblies; (3) inspection and testing reports of backflow assemblies; (4) performances of backflow assemblies; and (5) performance of licensed testers. All records will be on file at the administrative offices to allow access by City personnel.*

### **Reclaimed Water Requirements**

The final CCC program requirement is for systems that distribute or receive reclaimed water within their water service area. For these systems, additional CCC requirements may be imposed by the DOH in any permits issued in accordance with Chapter 90.46 RCW.

*The City currently does not distribute or receive reclaimed water within its service area; therefore, these requirements are not applicable. However, if reclaimed water is used in the future the City will follow all requirements of the permits issued under Chapter 90.46 RCW.*

## **PROGRAM IMPLEMENTATION AND RECOMMENDATIONS**

The City's CCC program is an ongoing effort that requires staffing and resources to ensure its effectiveness in protecting the quality of drinking water in the distribution system. It is recommended that the first step the City takes is to update its CCC resolution. The language in the resolution should reflect the requirements of WAC 246-290-490 and adopt the CCC program outlined in this document. In addition, the City should continue to reference the American Water Works Association (AWWA) manual entitled, "Recommended Practice for Backflow Prevention and Cross-Connection Control" (AWWA M14) for the development of its updated CCC program resolution.

The City should also adopt a hazard evaluation program based on risk to the public drinking water supply. This evaluation should rank existing and potential cross-connections as high, medium and low risk. Based on the results of this evaluation, the City should then begin an elimination program

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to eliminate the high-risk cross-connections first.

The City should also continue its inspection practices of the installed approved backflow assemblies. The City should continue documenting inspections in order to comply with the regulatory requirements.

The City currently meets the regulatory requirement of having at least one CCS (cross-connection specialist) to administer its CCC program. The City is encouraged to continue its active training program in order to comply with these requirements.