



Management Directive

Appendix # 2

to

Report # WW2018-001

Management Directive No.:	
Management Directive Name:	Water System Cross-Connection Control Management Directive
Date Approved by CAO or Designated Person:	
Date revision approved by CAO or Designated Person:	
Related SOP, Management Directive, Council Policy, Forms	Water System Cross-Connection Control Policy

Directive Statement and Rationale:

The Water System Cross-Connection Control Management Directive has been established to provide the framework of a backflow prevention program for industrial, commercial, and institutional (ICI) properties. This directive establishes operating policies and procedures as well as backflow preventer selection, installation, testing, and maintenance practices. This Program also maintains a list of Certified Backflow Preventer Testers to help ensure Qualified Persons are testing the Backflow Prevention Devices.

Scope:

This Management Directive applies to all new and existing ICI properties connected to, or wishing to connect to, the City of Kawartha Lakes municipal drinking water systems that are determined to have a moderate to high risk of causing a backflow event.

Definitions:

"Auxiliary water supply" means any water source or system, other than the City's water supply, that may be available in a building or on any property;

"Backflow" means the flowing back of or reversal of the normal direction of flow of water;

"Back-pressure" means the pressure of the non-potable system exceeds the positive pressure in the water distribution line, forcing the non-potable source back into the potable water supply;

"Back-siphonage" means a negative pressure occurs in the water piping system creating a partial vacuum, which draws water from the non-potable source back into the potable water supply;



Management Directive

“Backflow Prevention Device (BPD)” means a device that prevents back-pressure or back-siphonage into the water system and is designed to prevent contamination of the water supply. It can also be referred to as a Cross-Connection Prevention Device. Types of Backflow Prevention Devices are as follows:

- a) **Double Check Valve Assembly (DCVA)** - a BPD consisting of two force-loaded, independently acting check valves, including tightly closing resilient-seated shut-off valves located at each end of the assembly and fitted with properly located resilient-seated test cocks. This device is designed for use under continuous pressure;
- b) **Dual Check Valve (DuC)** - a BPD consisting of two independently acting, force-loaded, soft-seated check valves in series. This device does not have a relief port or test cocks. This device is designed for use under continuous pressure;
- c) **Reduced Pressure Principal Assembly (RP)** - a BPD consisting of a mechanically independent acting, hydraulically dependent relief valve located in a chamber between two independently operating force-loaded check valves, the intermediate chamber pressure always being lower than the supply pressure when there is a positive pressure on the supply side. The unit includes properly located resilient-seated test cocks and tightly closing resilient-seated shut-off valves at each end of the assembly. This device is designed for use under continuous pressure;

“City”, “City of Kawartha Lakes” or “Kawartha Lakes” means The Corporation of the City of Kawartha Lakes, including its entire geographic area, and includes its Officers, Directors, employees and agents;

“Commercial” means lands, buildings or structures or any part thereof used, designed or intended to facilitate the buying or selling of commodities or services, including those that relate to self-service and other storage facilities, hotels, inns, motels and boarding, lodging, rooming houses and recreational lodging and all those that are non-residential in nature but excluded from all other types of non-residential land, structures and buildings otherwise defined herein;

“Cross-connection” means any actual or potential connection between the waterworks and any source of pollution, contamination, or other material or substance that could change the quality of the water in the waterworks. This includes any bypass, jumper connection, removable section of pipe, swivel or changeover device, and any other temporary or permanent connecting arrangement through which backflow can occur. Individual protection would be installed on fixtures or appliances that have the potential of contributing to a cross-connection;



Management Directive

"CSA Standards" means the Canadian Standards Association B64.10-07/B64.10.1-07 "Selection and installation of backflow preventers/Maintenance and field testing of backflow preventers", or any successor thereof;

"Hazard" – shall be divided into three categories:

- a) **severe hazard** – any type of potential or actual cross-connection involving water that has additives or substances that under any concentration can create a danger to public health;
- b) **moderate hazard** – any connections involving water where the aesthetic qualities of water have been reduced and, under certain conditions, can create a danger to health;
- c) **minor Hazard** – any type of potential or actual cross-connection that involves a substance that does not have the ability to affect health but may be aesthetically objectionable in terms of taste, odour, and/or colour;

"Industrial" means lands, buildings or structures or any part thereof used, designed or intended for manufacturing, processing, fabricating, electricity generation, assembly of raw goods, warehousing or bulk storage of goods, and includes office uses and the sale of commodities to the general public where such uses are accessory to an industrial use, but does not include the sale of commodities to the general public through a warehouse club;

"Institutional" means lands, buildings or structures or any part thereof used by any non-profit organization, group or association for the promotion of charitable, educational or benevolent objectives, and includes post-secondary institutions, nursing homes and non-profit clubs;

"Owner" means a person who has any right, title, estate, or interest in a property, other than that of an occupant and, where that person is a corporation, shall include the officers, directors and shareholders of that corporation, and shall include any person with authority or power over or control of that property on the behalf of an owner. A developer is also included as an owner;

"Ontario Building Code" means the Ontario Regulation 332/12 or any successor thereof made under the Ontario Building Code Act;

"OWWA" means Ontario Water Works Association;

"Potable water" means water that is safe for human consumption as described by the Safe Drinking Water Act;



Management Directive

“Premise isolation” means that the backflow prevention device(s) are installed just within the facility on the service line connection of the potable water supply;

“Property” includes but is not limited to both public and private lands, a house, building, structure, lot or any part of a house, building, structure or lot within the City, and is adjacent to water and/or sewage works and may be entitled to a service connection;

“Qualified Person” refer to S.3.0;

“Residential” means lands, buildings or structures or any part thereof used, designed or intended to provide accommodation or quarters for living, sleeping, sanitary and culinary purposes, or otherwise to serve as a domestic residence;

“Test Report” means an inspection and testing report of backflow preventer containing the make, model, serial number, size, type, installation date, location and installation address and the test results;

“Test Tag” refer to S.2.2.6;

“Vacuum breaker” means a device that will prevent backflow when pressure in the system upstream of the device falls below atmospheric pressure. Air is only admitted downstream of the device.

Management Directive:

1.0 Water System Cross-Connection Control Program (CCCP)

The City is committed to the provision of safe reliable drinking water in accordance with all applicable standards, statutes and regulations, as amended or replaced from time to time. The prevention of cross-connections in all of the City of Kawartha Lakes drinking water systems is integral in the prevention of contamination of the drinking water supplied to residents. The City has implemented a Water System Cross-Connection Control Program to apply to all industrial, commercial and institutional (ICI) buildings in the City of Kawartha Lakes that are determined to have a moderate to severe risk of causing a backflow event including those owned by the City. This Program will ensure that the potential contamination of the City's potable water supply through cross-connections are identified and managed through the installation and maintenance of premise isolating Backflow Prevention Devices. Under the program, property owners are required to retain the services of a Qualified Person to perform a survey of their private water plumbing system in order to identify existing BPDs and to identify actual or potential cross-connections between potable



Management Directive

water and non-potable sources. The cost of the survey, installation of any required BPD, testing of the device, and any plumbing system repairs or modifications required for compliance are the responsibility of the property owner.

2.0 Program Overview

Industrial, commercial, and institutional properties will be assessed and surveyed as part of this program. The program will be executed in a manner that will address properties with high/severe hazard uses first and then look at properties with medium hazard uses:

- 2.1. Once an ICI property has been identified as a severe or moderate hazard the City will send a letter to the owner of the property explaining that they have been identified as a potential hazard and will be required to hire a Qualified Person to perform a Survey to determine any potential or existing risks related to cross-connections and backflow. The owner will be given **30 days** to address the notification and submit the completed survey to the Water & Wastewater Division. If no response is received from the property owner within the initial **30 days** a second letter will be sent explaining the significance of compliance with the program. They will be given an additional **15 days** to complete the survey. If no response is received within the additional **15 day** time frame, a final letter will be sent to outline the enforcement action to be taken, which could potentially lead to their water being shut off and/or up to a \$100,000.00 fine as set out under S.26 of By-law to Regulate Water and Wastewater Services in the City of Kawartha Lakes, as amended.
- 2.2. Once the completed survey has been returned to the City, the hazards on the property in question will be rated based off of the recommendation of the Qualified Person and in accordance with the CSA Standard B64.10-07/B64.10.1-07. A letter will be mailed to the property owner explaining the hazards and the required Backflow Prevention Device(s) needed to comply with the Program. If all potential cross-connections on the property already have the required BPDs the letter will notify the owner as such with the reminder that the devices must be tested at least once a year. If the property is determined not to be in compliance the owner will be given **45 days** to comply with the requirements and ensure the required BPDs are installed correctly. If no response is received from the property owner within the initial **45 days** a second letter will be sent explaining the significance of compliance with the program.



Management Directive

They will be given an additional **15 days** to complete the required work. If no response is received within the additional **15 day** time frame, a final letter will be sent to outline the enforcement action to be taken, which could potentially lead to their water being shut off and/or up to a \$100,000.00 fine as set out under S.26 of By-law to Regulate Water and Wastewater Services in the City of Kawartha Lakes, as amended.

Awareness is a key component of implementing a strong, effective cross-connection control program. The owners need to be made aware of the program and why it is so important. Program education initiatives will be delivered to inform owners of the dangers of backflow.

A survey of a residence will only be undertaken if there is a real or perceived higher than normal risk to the water utility from the residents.

3.0 Responsibilities

3.1. The City of Kawartha Lakes is responsible for the following:

- 3.1.1. The administration and enforcement of the City's Water System Cross-Connection Control Program Management Directive and affiliated documents such as "A By-law to Regulate Water and Wastewater Services in the City of Kawartha Lakes" and the associated Water System Cross-Connection Control Policy.
- 3.1.2. The City shall maintain a list of Qualified Persons
- 3.1.3. Creating, maintaining, and eliciting records from property owners and backflow prevention testers.
- 3.1.4. The maintenance and testing of BPDs at City operated Water & Wastewater facilities.
- 3.1.5. The promotion of the Water System Cross-Connection Control Program and fostering awareness of the program by educating owners about the risks and hazards associated with backflow contamination, particularly owners that require higher degrees of backflow prevention devices due to increased risk to the City's water supply.



Management Directive

3.2. The owner is responsible for:

- 3.2.1. The owner or occupant of the property shall keep in good repair and be responsible for the maintenance and repair of the backflow prevention devices installed on water and fire protection service lines on their property.
- 3.2.2. Hiring a Certified BPD Tester, as per S. 3.0 (*Qualified Persons*), to install premise isolation, provide proof of premise isolation to the City, having the Tester to inspect the device(s) on an annual basis, and provide proof of BPD inspection to the City. If a device fails that owner is responsible for hiring a licensed plumber to repair the device.
- 3.2.3. Every owner of an ICI building or structure shall, every five (5) years or as otherwise required by the City, carry out a survey of each of their buildings and structures with respect to all existing cross-connections and all existing required backflow prevention devices. Every owner shall:
 - 3.2.3.1. Ensure that such survey is carried out on a Cross-Connection Survey Form by a person permitted to do so pursuant to the Authorized Functions List (Schedule A); and
 - 3.2.3.2. Ensure that the completed Cross-Connection Survey Form is provided to the City within thirty (30) days of the survey being conducted.
- 3.2.4. Ensuring that every water service connection and private fire service main on the applicable property/properties has a Backflow Prevention Device installed and maintained in good working order downstream of the water meter.
- 3.2.5. The ownership of Backflow Prevention Devices shall remain with the owner.
- 3.2.6. The owner shall be responsible for providing the necessary information, scheduling, and access for inspection to allow a determination of backflow potential and the appropriate cross-connection control measures. A tag or label must be securely attached to every assembly containing the following information:

Side A

Name of owner

Location of assembly

Side B

Test date

Tester initials



Management Directive

Side A

Cross-connection protected
Type of assembly
Manufacturer
Serial #
Size

Side B

Certification #
Company tested by

It is the responsibility of the certified tester to ensure that this tag is fully completed after each test with a permanent waterproof pen. The tag must be completed and updated annually.

4.0 Qualified Persons

4.1. Qualified Persons are individuals whom meet the following requirements:

- The person is registered with the City's Water System Cross Connection Control Program;
- The person holds a valid and current Certificate of Achievement in Cross Connection Control endorsed by the Ontario Water Works Association (OWWA);
- The person is in possession of a current calibration certificate as required for the testing equipment to be employed;
- The person maintains commercial general liability insurance and;
- The person is authorized to perform the specified tasks as indicated in this Management Directive.

5.0 Qualification of Hazards

The City will identify facilities that potentially qualify and assign a preliminary risk rating based on CSA B.64.10-07, Clause 5.3.4. Owners of facilities will receive a letter notifying them of their risk rating and the requirement to hire an inspector/tester from the City's list of Qualified Persons. The Qualified Person shall inspect premises, complete survey form, and then submit the report to the City. The report from the Qualified Person shall indicate the appropriate Backflow Prevention Devices required for the facility to achieve premise isolation based of CSA standards. Following the initial survey completed by the Qualified Person, the risk rating for an ICI property may be altered. Although infrequent an ICI property can be designated as a Minor Hazard by the Qualified Person in which case they will be removed from the program, until such time as the uses changes at the facility.

A description of each category of hazard is included below:



Management Directive

- 5.1. Minor Hazards - Buildings or facilities that shall be isolated from the potable water supply by a DuC backflow preventer include the following:
- Residential premises with access to an auxiliary water supply (not directly connected);
 - Residential premises serving fewer than four dwelling units with single water service
 - Any buildings with a minor hazard classification based on Qualified Persons recommendation
- 5.2. Moderate Hazards - Buildings or facilities that shall be isolated from the potable water supply by a DCVA backflow preventer include the following:
- Pleasure-boat marinas;
 - Apartment or office building;
 - Multi-service interconnected facilities;
 - Schools and colleges;
 - Multi-tenant single-service facilities;
 - Shopping malls.
- 5.3. Severe Hazards - Buildings or facilities that shall be isolated from the potable water supply by a RP backflow preventer include the following:
- Chemical or plating plants;
 - Commercial laundries;
 - Dockside facilities for ships;
 - Food and beverage processing plants;
 - Hospital, operating, laboratory, or mortuary facilities;
 - Petroleum processing and storage facilities;
 - Plants using radioactive material;
 - Premises where access is restricted;
 - Trackside facilities for trains;
 - Sewage treatment plants;
 - Steam plants.
- 5.4. In the event there is a change in ownership or a change in use or zoning of a building or premise, a new survey is required to determine whether:
- The premise isolation device continues to adequately address previously identified hazards; and/or
The device requires upgrade or change; and/or
 - The device may be removed if the results of the new survey, as reviewed and approved by the City, have identified the building or premises change has eliminated any potential hazard(s).



Management Directive

6.0 Enforcement

- 6.1. The Director of Public Works has the authority under By-law to Regulate Water and Wastewater Services in the City of Kawartha Lakes to enforce compliance with the requirements of the program.
- 6.2. A municipal By-law Enforcement Officer is vested with the authority of enforcing provisions of this Management Directive, S. 26 of By-law to Regulate Water and Wastewater Services in the City of Kawartha Lakes, and the City's Water Systems Cross-Connection Control Policy.
- 6.3. No person shall hinder or obstruct, or attempt to hinder or obstruct, any Officer exercising a power or performing a duty related this Policy or the By-law. A person shall be deemed to have obstructed or hindered an Officer in the execution of their duties if he or she:
 - 6.3.1. Provides false information to an Officer; or
 - 6.3.2. Is alleged on probable grounds to have contravened any of the provisions of this Policy or affiliated documents.

7.0 Penalties

- 7.1. Every person who contravenes a provision of By-law to Regulate Water and Wastewater Services in City of Kawartha Lakes and by extension the Water System Cross-Connection Control Program shall be liable to a fine of not more than \$100,000.00.

8.0 Records Retention

The City's Water and Wastewater Division is responsible for the collection, retention and proper storage of all records and documents submitted in accordance with all applicable legislation and city by-laws.

9.0 References

AWWA Canadian Cross Connection Control Manual

City of Kawartha Lakes, By-law 2018-XXX, *"A By-law to Regulate Water and Wastewater Services in the City of Kawartha Lakes"* S. 17 and S. 26 (January 30, 2018)

Ontario Building Code, O.Reg 332/12



Management Directive

CSA B64.10-07/B64.10.1-07: Selection and installation of backflow preventers/Maintenance and field testing of backflow preventers

Ministry of the Environment and Climate Change – *A Guide for Drinking Water System Owners Seeing to Undertake a Backflow Prevention Program* (Nov 2014 – PIBS #9676e)



Management Directive

Appendix - Schedule A Authorized Functions List

Item	Function	Professional Engineer with Tester's Licence	Certified Engineering Technologist with Tester Licence	Licensed Master Plumber with Contractors and Tester Licence	³ Journeyman Plumber with Tester Licence	⁴ Apprentice Plumber with Tester Licence	Licensed Corporation Staff with Tester's Licence ¹	Fire System Sprinkler Fitter with Tester Licence	Lawn Irrigation System Installer with Tester's Licence
A	Perform Cross-Connection Survey	X	X	X	X		X		
B	Install, relocate, or replace backflow prevention device			X	X	X			
C	Repair of backflow prevention device	X	X	X	X	X	X		
D	Test backflow prevention device ²	X	X	X	X	X	X		
E	Item A, B, C and D above in relation to fire protection systems	X	X	X	X	X		X	
F	Item B, C, and D above in relation to lawn sprinkler systems	X	X	X	X	X			X

¹ Water distribution operator or in house maintenance staff are permitted to perform repairs if they have a tester's licence

² Anyone with a tester's licence as per CAN/CSA-B64.10, as amended, is permitted

³ Required to be employed by a Licensed Plumbing Contractor

⁴ Required to be employed by a Licensed Plumbing Contractor and under the direct supervision of a Journeyman Plumber



Management Directive

Revision History:

Proposed Date of Review:

Revision	Date	Description of changes	Requested By
0.0	[Date]	Initial Release	