

ORDINANCE NUMBER 2023-

DIVISION 2. - CROSS-CONNECTION CONTROL AND BACKFLOW PREVENTION³

Footnotes:

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Editor's note—Ord. No. 2006-17, adopted February 27, 2006, amended the Code by repealing former div. 2, §§ 86-61—86-70, and adding a new div. 2. Former div. 2 pertained to similar subject matter, and derived from the Code of 1964, §§ 26-25.1—26-25.10.

Sec. 86-61. - Background.

The Virginia Department of Health, Office of Drinking Water requires every owner to establish a program of cross connection control and backflow prevention (CCCP). The goal of the CCCP is to prevent the intrusion of contamination into the distribution system via cross-connections and backflow. The program is under authority of Virginia Department of Health, Office of Drinking Water Waterworks Regulations, Part II, Chapter 590, Sections 580 - 630 and shall not conflict with the Uniform Statewide Building Code (USBC).

(Ord. No. 2006-17, 2-27-06)

Sec. 86-62. - Administration of this division.

- (a) The Director of Public Works shall administer and enforce the provisions of this division under the direction of the City Manager.
- (b) The Director of Public Works shall assess properties served by the waterworks where cross-connection with the waterworks is deemed possible. The method of determining potential cross-connection with the waterworks and the administrative procedures shall be established by the Director of Public Works in a cross-connection control program approved by the Virginia Department of Health, Office of Drinking Water.

(Ord. No. 2006-17, 2-27-06)

Sec. 86-63. – Enforcement/Right of Entry.

- (a) Upon request, the owner or occupants of property served shall furnish the pertinent information regarding the consumer's water supply system on such property for the purpose of assessing and determining the degree of cross-connection hazards. The refusal to provide such information may result in water service to the property being discontinued.
- (b) To the extent permitted by law, the backflow prevention coordinator and any authorized designee shall have the right to enter property served by the waterworks upon reasonable notice to the owner and occupants for the purpose of inspecting the water supply system for cross-connection. Upon request,

the owner or occupants of property served shall furnish information regarding the consumer's water supply system for the purpose of assessing cross-connection hazards. The refusal to provide such information may result in water service to the property being discontinued.

- (c) Notice of violation. The owner of a consumer water supply system violating any provision of this division shall be served a written notice of violation, delivered personally or via certified mail stating the violation, corrective action required, and the date by which corrective action must be completed. The timeframe for corrective action depends on the degree of hazard. The owner must bring consumer's water supply system into compliance or have water service discontinued.
- (d) The owner of property served by the City's waterworks found guilty of violating any of the provisions of this division, or any related written order of the City Manager, or his/her designee in pursuance thereof, shall be guilty of a class 3 misdemeanor. Each day upon which a violation continues shall be deemed a separate and additional violation.
- (e) Any person, except a City Employee or an authorized volunteer of a fire company in performance of their respective duties, who connects to a fire hydrant without authorization from the Director of Public Works or with approval, but without an approved air gap or reduced pressure principle backflow prevention assembly, shall be guilty of a class 3 misdemeanor. Each day upon which a violation continues shall be deemed a separate and additional violation.

(Ord. No. 2006-17, 2-27-06)

Sec. 86-64. - Responsibilities of the City, et al.

- (a) Effective cross-connection control and backflow prevention requires the cooperation of the Director of Public Works, backflow prevention coordinator, the building official, the backflow device tester, and the owners of the property served.
- (b) The program shall be carried out in accordance with Virginia Department of Health, Office of Drinking Water Waterworks Regulations, and shall as a minimum provide containment of potential contaminants at the consumer's service connection.
- (c) The City has the responsibility for water quality and for the construction, maintenance and operation of the waterworks beginning at the water source and ending at the service connection.
- (d) The owner of the property served and the City have shared responsibility for water quality and for the construction, and operation of the consumer's water supply system from the service connection to the free-flowing outlet.
- (e) The Director of Public Works and the Virginia Department of Health, Office of Drinking Water shall, to the extent of their jurisdiction, provide continuing identification and evaluation of all cross-connection hazards. This shall include an assessment of each consumer's water supply system for cross-connections, which may result in requirement for owner to install a backflow prevention device or separation. Assessments shall be performed at least every five years.
- (f) In the event of the backflow of pollution or contamination into the waterworks, the City shall promptly take or cause corrective action to confine and eliminate the pollution or contamination. The Director of Public Works shall report to the appropriate Virginia Department of Health, Office of Drinking Water in the most expeditious manner within one business day when a backflow occurs and shall submit a written report by the tenth day of the month following the month during which backflow occurred addressing the incident, its causes, effects, and preventative or control measures required or taken.
- (g) The Director of Public Works shall take positive action to ensure that the waterworks is adequately protected from cross-connections and backflow at all times. If a cross-connection exists or backflow occurs into a consumer water supply system or into the waterworks, or if the consumer's water supply system causes the pressure in the waterworks to be lowered below 20 psig, water service to the consumer may be discontinued and shall not be restored until the deficiencies have been corrected or eliminated to the satisfaction of the Director of Public Works.

- (h) In order to protect the occupants of a premise, the backflow prevention coordinator shall inform the consumer's water supply system owner of any cross-connection that should be abated or eliminated by application of an appropriate backflow prevention assembly or elimination method. Appropriate backflow prevention assembly or elimination should be applied at each point-of-use and/or applied to the consumer's water supply system, isolating an area which may be a health or contamination hazard to the consumer's water supply system or to the waterworks.
- (i) Records and an inventory of inspection, testing, repairs, and maintenance of all backflow prevention assemblies, backflow elimination methods, and backflow prevention devices shall be maintained by the Director of Public Works for ten years.
- (j) The building official for the City of Waynesboro shall review building plans and inspect plumbing as it is installed and is responsible for preventing the design and installation of new cross-connections within the City.

(Ord. No. 2006-17, 2-27-06)

Sec. 86-64.1. - Responsibilities of owner of consumer water supply system.

- (a) The owner of a consumer water supply system shall, at their own expense, install, operate, test, and maintain required backflow prevention assemblies or backflow elimination methods.
- (b) The owner of a consumer water supply system shall provide copies of test results, maintenance records and overhaul records to the Director of Public Works within 30 days of completion of testing or work.
- (c) The owner of a consumer water supply system shall not allow a required backflow prevention assembly or backflow elimination method to become inoperable or allow it to be bypassed.

Sec. 86-64.2. – Responsibilities of the backflow device tester

- (a) Persons testing and repairing backflow prevention assemblies shall be certified as a backflow prevention device worker by a Commonwealth of Virginia tradesman certification program.
- (b) The certified tester is responsible for testing, inspection, and repair of backflow prevention assemblies. The tester shall not change the design or operational characteristics of an assembly during repair or maintenance without prior approval from the building code official (plumbing permit maybe required).

(Ord. No. 2006-17, 2-27-06)

Sec. 86-65. - Preventive measures for containment.

- (a) Backflow prevention assemblies or separation shall be installed at the service connection to a consumer's water supply system where, in the judgment of the backflow prevention coordinator a health or pollution hazard to the consumers water supply system or to the waterworks shall otherwise exist unless such hazards are abated or prevented.
- (b) Special conditions.
 - (1) When, as a matter of practicality, the backflow prevention assembly or backflow elimination method cannot be installed at the service connection, the assembly or method may be located downstream of the service connection but prior to any unprotected takeoffs.
 - (2) Where the consumer's water supply system is not intricate or complex and where actual and potential cross-connections can be eliminated or controlled, instead of containment, the consumer may use point-of-use isolation protection by application of an appropriate backflow prevention assemblies, backflow prevention devices, or backflow elimination methods complying with the USBC and approved the Backflow Prevention Coordinator or the Building Official.

- (c) A backflow prevention assembly or backflow elimination method shall be installed at each service connection to a consumer's water supply system serving premises where the following conditions are found to exist:
 - (1) A substance is handled in such a manner as to create an actual or potential hazard to a waterworks (this shall include premises having auxiliary water systems or having sources or systems containing process fluids or waters originating from a waterworks owner).
 - (2) Internal cross-connections exist that, in the judgment of the backflow prevention coordinator may not be easily correctable or intricate or complex plumbing arrangements which make it impracticable to determine whether or not cross-connections exist.
 - (3) Security requirements or other prohibitions or restrictions prevent the assessment of all cross-connections that may impair the quality of the water delivered.
 - (4) There is a repeated history of cross-connections being established or reestablished.
 - (5) The Backflow Prevention Coordinator can show that a potential cross-connection hazard exists.

- (d) Premises having booster pumps or fire pumps connected to the waterworks shall have the pumps equipped with control devices to prevent a reduction of pump suction line pressure to less than 20 psig.

- (e) Subject to subsection (b), an approved backflow prevention assembly or backflow elimination method shall be installed at each service connection for the following types of facilities:
 - (1) Hospitals, mortuaries, clinics, veterinary establishments, nursing homes, and medical buildings;
 - (2) Laboratories;
 - (3) Piers, docks, and waterfront facilities;
 - (4) Sewage treatment plants, sewage pumping stations, and stormwater pumping stations;
 - (5) Food and beverage processing plants; restaurants and food service establishments;
 - (6) Chemical plants, dyeing plants and pharmaceutical plants;
 - (7) Metal plating industries;
 - (8) Petroleum or natural gas processing or storage plants;
 - (9) Radioactive materials processing plants or nuclear reactors;
 - (10) Car washes and laundries;
 - (11) Building with commercial, industrial, or institutional occupants served through a master meter;
 - (12) Water loading facilities;
 - (13) Lawn sprinkler systems, irrigation systems;
 - (14) Fire service systems;
 - (15) Slaughter houses and poultry processing plants;
 - (16) Farms where the water is used for other than household purposes;
 - (17) Commercial greenhouses and nurseries;
 - (18) Health clubs with swimming pools, therapeutic baths, hot tubs or saunas;
 - (19) Paper and paper products plants and printing plants;
 - (20) Pesticide or exterminating companies and their vehicles with storage or mixing tanks;
 - (21) Facilities that blend, store, package, transport, or treat chemicals, and their related vehicles;

- (22) Schools or colleges with laboratory facilities;
 - (23) High-rise commercial, buildings (four or more stories);
 - (24) Multiuse commercial, offices, or warehouse facilities; and
 - (25) Others specified by the backflow prevention coordinator when reasonable cause can be shown for a potential backflow or cross-connection hazard.
- (f) Where lawn sprinkler systems, irrigation systems or fire service systems are connected directly to the waterworks with a separate service connection, a backflow prevention assembly or backflow elimination method shall be installed at the service connection or pursuant to Subsection (b).
- (g) All temporary or emergency connections shall be protected where reasonable cause can be shown for a potential backflow or cross-connection hazard. Backflow prevention assemblies or backflow elimination methods used shall be appropriately certified or approved to match the requirement of this section.
- (h) Temporary use of fire hydrants for non-firefighting purposes must be authorized by the Director of Public Works. All connections to fire hydrants shall be equipped with an approved air gap or a reduced pressure principle backflow prevention assembly.

(Ord. No. 2006-17, 2-27-06)

Sec. 86-66. - Types of protection required.

- (a) The backflow prevention assembly or backflow elimination method or backflow elimination assembly used shall depend on the degree of hazard which exists or may exist. The owner shall ensure maintenance of the distribution system and its usefulness. Table 1 shall be used as a guide to determine the degree of hazard for any situation.

TABLE 1 — DETERMINATION OF DEGREE OF HAZARD

Cross-connections that meet or may meet the following conditions shall be rated at the corresponding degree of hazard.

High Hazard	Low Hazard
The contaminant would be toxic, poisonous, noxious, unhealthy, or of unknown quality.	The contaminant would only degrade the quality of the water aesthetically or impair the usefulness of the water.
A health hazard would exist.	A health hazard would not exist.
The contaminant would disrupt the service of piped water for human consumption.	The contaminant would not disrupt the service of piped water for human consumption.
Backflow would be by either backpressure or backsiphonage.	Backflow would occur by backsiphonage.
Examples: lawn irrigation systems, fire sprinkler systems with chemical additives or antifreeze, sewage, used water, nonpotable water, auxiliary water systems, and mixtures of water and other liquids, gases, or other chemicals.	Examples: food residuals, coffee machines, non-carbonated beverage dispensers, and residential fire sprinkler systems constructed of materials designed for potable water flow.

- (b) The degree of hazard, either high or low, is based on the nature of the contaminate; the potential health hazard; the probability of the backflow occurrence; the method of backflow either by backpressure or by back-siphonage; and the potential effect on waterworks structures, equipment, and appurtenances used in the storage, collection, purification, treatment, and distribution of potable water.
 - (1) An air gap or physical disconnection gives the highest degree of protection and shall be used whenever practical to do so in high hazard situations subject to backpressure.
 - (2) An air gap, physical disconnection and a reduced pressure principle backflow assembly will protect against backpressure when operating properly.
 - (3) Pressure vacuum breakers will not protect against backpressure, but will protect against back-siphonage when operating properly. Pressure vacuum breakers may be used in hazard situations subject to back-siphonage only, for isolation protection and not for containment.
 - (4) A double check valve assembly shall not be used in high hazard situations.
 - (5) Barometric loops are not acceptable.
 - (6) Interchangeable connections or change-over devices are not acceptable.

(Ord. No. 2006-17, 2-27-06)

Sec. 86-67. - Backflow prevention assemblies and backflow prevention by separation for containment.

- (a) Backflow prevention assemblies for containment include the reduced pressure principle backflow prevention assembly, the double check valve assembly.
- (b) Backflow prevention by separation shall be an air gap or physical disconnection. The minimum air gap shall be twice the effective opening of a potable water outlet unless the outlet is a distance less than three times the effective opening away from a wall or similar vertical surface, in which case the minimum air gap shall be three times the effective opening of the outlet. In no case shall the minimum air gap be less than one inch.
- (c) Backflow prevention by separation shall be of the approved type and shall comply with the most recent USBC.
- (d) Backflow prevention assemblies shall be installed in a manner approved by the USBC and the manufacturer's installation instructions.
- (e) For the purpose of application to special conditions, Subsection 86-65(b)(2), point-of use isolation assemblies or separations shall be as specified where reasonable assurance can be shown that the device or separation will protect the waterworks. As a minimum, point-of use assemblies should bear an appropriate American Society of Sanitary Engineering Standard Number. See the Cross-connection Control Program, Appendix A, for Isolation Device Application.
- (f) Backflow prevention assemblies with opening outlets or vents that are designed to operate or open during backflow prevention shall not be installed in pits, areas subject to flooding, areas with atmospheric conditions that represent a contamination threat to the potable water supply, or in such a manner as to be able to be bypassed.
- (g) Atmospheric Vacuum Breakers (AVB) and Pressure Vacuum Breakers (PVB) are not approved as containment assemblies.

(Ord. No. 2006-17, 2-27-06)

Sec. 86-68. - Maintenance and inspection requirement.

- (a) It shall be the responsibility of the consumer's water supply system owner(s) to maintain all backflow prevention assemblies or separations in good working order and to make no piping or other arrangements for the purpose of bypassing or defeating backflow prevention assemblies or separations.
- (b) Operational testing and inspection schedules shall be established by the outline in the cross-connection control program for all backflow prevention assemblies and separations. The interval between testing and inspection of each device shall be established in accordance with the age and condition of the device and the device's manufacturer's recommendations. RPZ assemblies, double check valve assemblies, double check detector backflow assemblies, and pressure vacuum breaker assemblies shall be inspected after initial installation, immediately after repairs or relocation, and annually thereafter.
- (c) Backflow prevention device overhaul procedures and replacement parts shall be in accordance with the manufacturer's recommendation.
- (d) Backflow prevention device testing procedures shall be in accordance with one of the following standards: ASSE 5010-1013-1, Sections 1 and 2; ASSE 5010-1015-1, Sections 1 and 2; ASSE 5010-1015-2; ASSE 5010-1015-3, Sections 1 and 2; ASSE 5010-1015-4, Sections 1 and 2; ASSE 5010-1020-1, Sections 1 and 2; ASSE 5010-1047-1, Sections 1, 2, 3 and 4; ASSE 5010-1048-1, Sections 1, 2, 3 and 4; ASSE 5010-1048-2; ASSE 5010-1048-3, Sections 1, 2, 3 and 4; ASSE 5010-1048-4, Sections 1, 2, 3 and 4; or CAN/CSA B64.10.

(Ord. No. 2006-17, 2-27-06)

Sec. 86-70. - Definitions.

Air gap means the unobstructed vertical distance through the free atmosphere between the lowest point of the potable water outlet and the flood level rim of the receiving vessel.

Auxiliary water system means any water supply or system on or available to the premises of the consumer other than the waterworks. These auxiliary waters may be polluted, contaminated, objectionable, or of questionable quality, and constitute an unapproved water supply or system over which the owner does not have control

Backflow means the reversed flow of non-potable water or other liquids, mixtures, or substances of questionable quality into a waterworks.

Backflow prevention assembly means a mechanical unit, designed to control various cross-connections and stop the reversal of flow, which includes an inlet and outlet shut-off valve and test cocks to facilitate testing of the assembly. Backflow prevention assemblies include the reduced pressure principle backflow prevention assembly, double check valve assembly, and the pressure vacuum breaker assembly.

Backflow prevention device means a mechanical unit designed to control cross-connections and stop the reversal of flow, which is not testable because it does not have inlet and outlet shut-off valves or test cocks. Backflow prevention assemblies are not generally designed or constructed to withstand continuous pressure over 12 hours, or to control high hazards. A backflow prevention device generally includes the atmospheric type vacuum breakers and the dual check valve type devices.

Backflow elimination method means the air gap separation or physical disconnection, which will eliminate the cross-connection.

Backpressure backflow means backflow caused by pressure in the downstream piping which is superior to the supply pressure at the point of consideration.

Back-siphonage backflow means backflow caused by a reduction in pressure which causes a partial vacuum creating a siphon effect.

Consumer means person receiving water for human consumption from a waterworks.

Consumer's water supply system ("consumer's system") means any water system located on the consumer's premises, supplied by or in any manner connected to a waterworks.

Containment means the safeguard against backflow into a waterworks from a consumer's water supply system by installing an appropriate backflow prevention assembly, backflow prevention device, or backflow elimination method at the service connection or downstream of the service connection but before any unprotected takeoffs.

Contaminant means any objectionable or hazardous physical, chemical, biological, or radiological substance or matter in water.

Cross-connection means any actual or potential link, connection, or physical arrangement, direct or indirect, between used water, an auxiliary water system, or other source of contamination or pollution to the waterworks through which backflow can occur.

Degree of hazard means either a high, moderate or low hazard based on the nature of the contaminant; the potential health hazard; the probability of the backflow occurrence; the method of backflow either by backpressure or by back-siphonage; and the potential effect on waterworks structures, equipment, and appurtenances used in the storage, collection, purification, treatment, and distribution of potable water.

Distribution main means a water pipeline whose primary purpose is to convey drinking water to service connections.

Domestic use or usage means normal family or household use, including drinking, laundering, bathing, cooking, heating, cleaning and flushing toilets (see appendix A for title 32.1, article 2, Code of Virginia, 1950, as amended).

Double check valve assembly or "*Double check detector backflow assembly*" means a backflow prevention assembly composed of two independently operating, spring-loaded check valves, tightly closing shutoff valves located at each end of the assembly and test cocks to facilitate testing of the assembly, used for low hazard situations.

Entry point means the place where water from the source is delivered to the distribution system. Where two or more sources are combined before distribution, the entry point is the location that is representative of the blended water following all treatment.

Health hazard means any condition, device, or practice in a waterworks or its operation that creates, or may create, a danger to the health and well-being of the water consumer.

Isolation means the safeguard against backflow into a waterworks from a consumer's water supply system by installing an appropriate backflow prevention assembly or device or by a backflow elimination method at the sources of potential contamination in the consumer's water supply system. This is also called point-of-use isolation.

Maximum contaminant level means the maximum permissible level of a contaminant in potable water which is delivered to any consumer of a waterworks. Maximum contaminant levels may be either "primary" (PMCL) meaning based on health considerations or "secondary" (SMCL) meaning based on aesthetic considerations.

Physical disconnection means the removal or absence of pipes, fittings, or fixtures that connect a waterworks directly or indirectly to a non-potable system or one of questionable quality.

Plumbing fixture means a receptacle or device which is either permanently or temporarily connected to the water distribution system of the premises, and demands a supply of water therefrom; or discharges used water, waste materials, or sewage either directly or indirectly to the drainage system of the premises; or requires both a water supply connection and a discharge to the drainage system of the premises.

Pollution means the presence of any foreign substance (chemical, physical, radiological, or biological) in water that tends to degrade its quality so as to constitute an unnecessary risk to human health or impair the usefulness of the water.

Potable water means water fit for human consumption and domestic use which is sanitary and normally free of minerals, organic substances, and toxic agents in excess of reasonable amounts for domestic usage in the area served and normally adequate in quantity and quality for the minimum health requirements of the persons served.

Premises means a piece of real estate; house or building and its land.

Pressure vacuum breaker assembly means a backflow prevention assembly designed to prevent back-siphonage backflow and used for high hazard or low hazard situations, composed of an independently operating, spring-loaded check valve; an independently operating, spring-loaded air-inlet valve; and tightly closing shutoff valves located at each end of the assembly; and fitted with properly located test cocks to facilitate testing of the assembly.

Process fluids means any kind of fluid or solution which may be chemically, biologically, or otherwise contaminated or polluted which would constitute a health, environmental, or system hazard if introduced into the waterworks. This includes:

- (1) Polluted or contaminated water;
- (2) Used waters;
- (3) Cooling waters;
- (4) Contaminated natural waters taken from wells, lakes, streams, or irrigation systems;
- (5) Chemicals in solution or suspension; and
- (6) Oils, gases, acids, alkalis, and other liquid and gaseous fluid used in industrial or other processes.

Reduced pressure principle backflow prevention assembly (RPZ assembly) means an assembly designed to prevent back-siphonage or backpressure backflow and used for high or low hazard situations, composed of a minimum of two independently operating, spring-loaded check valves together with an independent, hydraulically operating pressure differential relief valve located between the two check valves. During normal flow and at the cessation of normal flow, the pressure between these two checks shall be less than the supply pressure. The assembly must include tightly closing shutoff valves located at each end of the assembly and be fitted with properly located test cocks to facilitate testing of the assembly.

Service connection means the point of delivery of finished water from a waterworks to a consumer's water system, fire protection system, irrigation system, and to all other points where finished water is delivered through the distribution system to a consumer. Generally, the service connection occurs at the water meter, or at the distribution main if no water meter is installed, or in the case of an owner of both the waterworks and the building supplied, the point of entry into the building. Service connections may be permanent, temporary or emergency.

System hazard means a condition posing a threat of or actually causing damage to the physical properties of the waterworks or a consumer's water supply system.

Used water means potable water supplied by a waterworks to a consumer's water supply system after it has passed through the service connection and is no longer under the control of the owner.

Water supply means the source of water taken into a waterworks including all wells, streams, springs, lakes or reservoirs, and other bodies of surface water (natural or impounded), and the tributaries thereto, and all impounded groundwater. The term "water supply" shall not include any waters above the point of intake of the waterworks.

Waterworks means a system that serves piped water for drinking or domestic use to:

- (1) The public;
- (2) At least 15 connections; or
- (3) An average of 25 individuals for at least 60 days out of the year.

The term "waterworks" shall include all structures, equipment, and appurtenances used in the storage, collection, purification, treatment, and distribution of potable water except the piping and fixtures inside the building where such water is delivered.

Waterworks owner means an individual, group of individuals, partnership, firm, association, institution, corporation, government entity, or the federal government which supplies or proposes to supply water to any person within this state from or by means of any waterworks.

(Ord. No. 2006-17, 2-27-06)

Secs. 86-71—86-74. - Reserved.

CERTIFICATE

The undersigned Mayor and Clerk of the City Council of the City of Waynesboro, Virginia hereby certify that the foregoing constitutes a true and correct copy of an ordinance entitled DIVISION 2. - CROSS-CONNECTION CONTROL AND BACKFLOW PREVENTION adopted by the City Council at a meeting held on _____ .

Introduced: ON SEPTEMBER 25, 2023 BY COUNCIL MEMBER TERRY SHORT, JR.

Adopted:

Effective:

[SEAL]

ATTEST: _____
Clerk, City Council
City of Waynesboro, Virginia

Mayor, City Council
City of Waynesboro, Virginia