



POLICY NO. **98002**
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**COUNTY OF BRUNSWICK
PUBLIC UTILITIES DEPARTMENT**

**Title: CROSS-CONNECTION AND BACKFLOW
 PROTECTION POLICY**

- A. GENERAL.** The intention of this policy to define the authority of the County of Brunswick, hereinafter referred to as the *County*, as the water purveyor, in the elimination of all hazards, both actual and potential, to the potable water within the County's public water supply system.

This ordinance will comply with the Federal *Safe Drinking Water Act* (SDWA) (P.L. 93-523), the *North Carolina Administrative Code* (NCAC) (*Title 10, Chapter 10, Subchapter 10-D, Subparagraph .1006*), and the *North Carolina Building Code* (Volume II) as they pertain to cross-connections with the public water supply system and will apply the principle that the degree of protection should be commensurate with the degree of the hazard or potential hazard to the public water supply system.

- B. PURPOSE.** The purpose of this cross-connection and backflow protection policy for the County's Public Utilities Department are as follows:
- 1.** Protect the County's public potable water supply against actual or potential contamination (i.e., cross-connections, backflow, backsiphonage) by isolating and containing, within the Consumer's premises or private property, contamination or pollution that has occurred or may occur because of some uncontrolled (i.e., undiscovered or unauthorized) cross-connection on the Consumer's premises or private property back into the public water supply.
 - 2.** Eliminate or control existing cross-connections, both actual and potential, (backflow, backsiphonage or any other source of water or process water used for any purpose whatsoever) which may jeopardize the potability of the County's public water supply system.
 - 3.** Establish and maintain a continuing program of cross-connection control and inspection which will systematically and effectively prevent the contamination or pollution, either actual or potential, of all potable water systems connected to the County's public water supply system.
 - 4.** Control cross-connections (i.e., backflow and backsiphonage) through cooperation between the County and the County's customers (Consumers). Responsibilities and duties of each will be set forth in this policy and their applicable regulations.

C. **RESPONSIBILITIES.** The Public Utilities Director, hereinafter referred to as *Director*, shall be responsible for the protection of the public potable water distribution system from contamination or pollution due to the backflow or backsiphonage of contaminants or pollution through the water service connection. If, in the judgment of the Director, or his duly appointed representative, an approved backflow prevention assembly is required (at the Consumer's water service connection; or, within the Consumer's private water system) for the safety of the water system, the Director, or his authorized representative, shall give notice, in writing, to said Consumer to install such an approved backflow prevention assembly(s) on his or her premises. The Consumer shall install, or have installed, within a period of time defined in this policy, such an approved backflow prevention assembly(s) at the Consumer's own expense. Failure, refusal, or inability on the part of the Consumer to install, have tested, and maintain said assembly(s), shall constitute grounds for enforcement (i.e., stipulated penalties, disconnection of water service, etc.) until such requirements have been satisfactorily met. Enforcement of this policy shall be administered by the Director or an authorized representative of the County.

D. **DEFINITIONS.**

1. **Air Gap** (Separation). The term "*air gap*" shall mean a physical separation between the free flowing discharge end of a potable water supply pipeline and an open or non-pressure receiving vessel. An approved "*air gap*" shall be at least double the diameter of the supply pipe measured vertically above the overflow rim of the vessel, but in no case less than 1-inch (2.54 cm).
2. **Approved.** (1) The term "*approved*" as herein used in reference to water supply shall mean a water supply that has been approved by the North Carolina Division of Environmental Health, Public Water Supply Section. (2) The term "*approved*" as herein used in reference to an air gap, a double check valve assembly, a reduced pressure backflow prevention assembly or other backflow prevention assemblies or methods shall mean an approval by the Public Utilities Department based on a favorable report by an approved testing laboratory (i.e., FCCCHR-USC, Underwriters Laboratory, Factory Mutual, etc.).
3. **Atmospheric Vacuum Breaker (AVB).** A backflow prevention assembly used to prevent backsiphonage which is designed so as not to be subject to static line pressure. These devices are not approved in the County's service areas except in special conditions approved by the Director, or by his authorized representative(s).
4. **Auxiliary Water Supply.** Any water supply on or available to the premises other than the purveyor's (County) approved public water supply will be considered as an auxiliary water supply. These auxiliary waters may include, but not limited to, water from another purveyor's public potable water supply or any natural source(s) (i.e., well, spring, river, stream, pond, lake, re-use waters, or industrial fluids, etc.). These waters may be contaminated or polluted or they may be objectionable and constitute an unacceptable water source over which the water purveyor does not have sanitary control.

5. **Backflow.** The undesirable reversal of flow of waters or mixtures of water and other liquids, gases, or other substances into the distribution lines of the potable supply of water from any source(s). See terms *Backpressure* and *Backsiphonage* (see **D.9** and **D.10**, respectively).

6. **Backflow Prevention Assembly** (Approved). An assembly or means designed to prevent backflow into the potable water supply system. These assemblies shall be reviewed and approved by the County and shall have been shown to meet or exceed the design and performance standards of the *American Society of Sanitary Engineers* (ASSE), *American Water Works Association* (AWWA), and/or the *Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California* (FCCCHR-USC). The approval of backflow prevention assemblies by the Public Utilities Department is based on a favorable report by an approved testing laboratory (i.e., FCCCHR-USC, Underwriters Laboratory, Factory Mutual, etc.), recommending such an approval. The following are approved methods for backflow prevention:
 - a. *Air Gap* (AG) (see **D.1**);
 - b. *Reduced Pressure Principle Assembly* (RP or RPZ) (see **D.41**);
 - c. *Double-Check Valve Assembly* (DCVA) (see **D.23**);
 - d. *Double-Check Detector Assembly* (fire system) (DCDA) (see **D.22**);
 - e. *Reduced Pressure Principle-Detector Assembly* (fire system) (RPDA) (see **D.42**); and
 - f. *Pressure Vacuum Breaker* (PVB) (see **D.38**).

7. **Backflow Prevention Assembly** (Unapproved). An assembly that has been investigated by the County and has been determined to be unacceptable for installation within the County's water system. Consideration for disapproval and removal from the "Approved List" shall be based upon, but not limited to, the following criteria:
 - a. Poor performance standards (i.e., significant failure rate);
 - b. Lack of or unavailability of repair parts; and/or,
 - c. Poor service or response from assembly's manufacturing representative(s).

8. **Backflow Prevention Assembly Technician (Certified)**. A person that has proven his or her competency to the satisfaction of the State of North and is certified to make competent tests, or to repair, overhaul and make reports on backflow prevention assemblies shall be knowledgeable of applicable laws, rules, and regulation; shall be a licensed plumber or have had at least two (2) years experience under a licensed plumber

or plumbing contractor, or have equivalent qualifications acceptable to the State of North Carolina; and must hold a certificate of completion, from an acceptable training program (i.e., *NC AWWA*) in the testing, repair, and reporting of backflow prevention assemblies.

9. **Backpressure.** Backflow caused by a pump, elevated tank, boiler, or other means that could create pressure within the system greater than the supply pressure.
10. **Backsiphonage.** A reversal of the normal direction of flow in the lines due to a negative pressure (vacuum) being created in the supply line with the backflow source subject to atmospheric pressure.
11. **Bypass Loop.** Loops installed to circumvent an installed backflow preventer (including detector loops on check valves). These loops are prohibited unless the loops are equipped with and approved backflow preventer of the same type used on the main supply line.
12. **Check Valve.** A device that is drip-tight in the normal direction of flow when the inlet pressure is at least one (1) psi and the outlet pressure is zero. The check valve shall permit no leakage in a direction reversed to the normal flow. The closure element (clapper, poppet, or other design) shall be internally spring loaded to promote rapid and positive closure. An approved check valve is just one component of an approved backflow prevention assembly (i.e., pressure vacuum breaker, double-check valve assembly, double-check detector assembly, reduced pressure principle assembly, or reduced pressure principle detector assembly).
13. **Consumer's Potable Water System.** That portion of the privately owned potable water system located between the point of delivery (service connection) and the point of use. This system shall include, but not limited to, the following: all pipes, conduits, tanks, receptacles, fixtures, equipment, and appurtenances used to produce, convey, store, or use potable water.
14. **Consumer's Water System.** Any water system located on the consumer's premises, whether supplied by a public potable water supply or an auxiliary water supply. The system or systems may be either a potable water system or an industrial piping system.
15. **Customer/Consumer.** Any person, firm, or corporation responsible for property at which water from the County of Brunswick's public water supply system is received. In the absence of other parties or the failure of other parties to accept the responsibilities herein set forth, the owner of record shall be ultimately responsible.
16. **Containment.** Preventing the contamination/pollution of the public potable water supply by installing an approved backflow prevention assembly and /or method at the service connection. The term "*service protection*" shall mean the appropriate type or method of backflow protection at the service connection, commensurate with the degree of hazard of the consumer's potable water system.

17. **Contamination.** An impairment of the quality of the water which creates an actual hazard to the public health through poisoning or through the spread of disease by sewage, industrial fluids, waste, etc.
18. **Cross-Connection.** Any unprotected, actual or potential connection or structural arrangement between a public or a Consumer's potable water system and any other source or system through which it is possible to introduce into any part of the potable system any used water, industrial fluids, gas, or substance other than the intended potable water with which the system is supplied. Bypass arrangements, jumper connections, removable sections, swivel or change-over devices and other temporary or permanent devices through which or because of which backflow can or may occur are considered to be cross-connections. (1) The term "*direct cross-connection*" shall mean a cross-connection which is subject to both backsiphonage and backpressure. (2) The term "*indirect cross-connection*" shall mean a cross-connection which is subject to backsiphonage only.
19. **Cross-Connection (Controlled).** A connection between a potable water system and a non-potable water system with an approved backflow prevention assembly properly installed and maintained so that it will continuously afford the protection commensurate with the degree of hazard.
20. **Cross-Connection, Direct.** Any arrangement of pipes, hoses, fixtures, or devices connecting a potable water supply to a non-potable source which is permanent (i.e., a boiler feed line connected directly to potable water line, etc.). This definition does not apply to any county, municipal or volunteer personnel engaged in public fire protection.
21. **Cross-Connection, Indirect.** Any arrangement of pipes, hoses, fittings, or fixtures that may be temporary in nature (i.e., garden hose; hose connected directly to a fire hydrant for filling a tank, etc.) connecting to a potable water supply to a non-potable supply.
22. **Director.** County of Brunswick, Public Utilities Director, his successor or designee(s).
23. **Double-Check Valve Detector Assembly (DCDA) (Approved).** A double-check valve assembly, with a specific bypass water meter and a meter-sized approved double-check valve assembly. The meter shall register in U.S. gallons accurately for only very low rates of flow (up to 3-gallons per minute) and shall show a registration for all rates of flow. The unit shall include tightly closing shut-off valves located at each end of the assembly and each assembly shall be fitted with properly located test cocks. This assembly shall be used to protect against a non-health hazard on fire line systems.
24. **Double-Check Valve Assembly (DCVA) (Approved).** Any assembly composed of two (2) independently acting, approved check valves, including tightly closing resilient seated shut-off valves located at each end of the assembly and suitable connections for testing the water tightness of each check valve.
25. **Dual Check Valve.** A self-closing device designed to permit flow in one (1) direction and close if there is a reversal of flow. A dual check valve is not an in-line testable device and is only allowed for residential use in ¾" and 1" meter assemblies, excluding irrigation systems.

26. **Dwelling Unit.** A single unit providing complete, independent living facilities for one (1) or more persons including permanent provisions for living, sleeping, food preparation and sanitation, per *Article 2* of the County's zoning ordinance.
27. **Fire System.** A system of piping which may include sprinklers, hose connections, hydrants, or fixed spray nozzles that may be wet or dry, open or closed for the use of suppressing fires.
28. **Hazard, Degree of.** Either a polluttional (non-health) or contamination (health) hazard and is derived from the evaluation of conditions within a system. (1) *Health* - An actual or potential threat of contamination of a physical or toxic nature to the public potable water system or the Consumer's potable water system that would be a danger to health. (2) *Plumbing* - An internal or plumbing type cross-connection in a Consumer's potable water system that may be either a polluttional or a contamination type hazard. This includes, but not limited, to cross-connection to toilets, sinks, lavatories, wash trays and lawn sprinkling systems. Plumbing type cross-connections can be located in many types of structures including homes, apartment houses, hotels, and commercial or industrial establishments. Such a connection, if permitted to exist, must be properly protected by an appropriate type of backflow prevention assembly. (3) *Polluttional* - An actual or potential threat to the physical properties of the water system or the potability of the public or the Consumer's potable water system but which would not constitute a health or system hazard, as defined. The maximum degree or intensity of pollution to which the potable water system could be degraded under this definition would cause nuisance or be aesthetically objectionable or could cause minor damage to the system or its appurtenances. (4) *System* - An actual or potential threat of severe danger to the physical properties of the public or the Consumer's potable water system or of a pollution or contamination which would have a protracted effect on the quality of the potable water in the system.
29. **Industrial Fluids.** Any fluid or solution which may be chemically, biologically, or otherwise contaminated or polluted in a form or concentration which would constitute a health, system, polluttional, or plumbing hazard if introduced into an approved water supply. This may include, but not limited to, polluted or contaminated used waters; all types of process waters and "*used waters*" originating from the public potable water system which may deteriorate in sanitary quality; chemicals in fluid form; plating acids and alkalis; circulated cooling waters connected to an open cooling tower and/or cooling waters that are chemically or biologically treated or stabilized with toxic substances; contaminated natural waters such as from wells, springs, streams, rivers, ponds, lakes, irrigation canals or system, etc.; oils, gases, glycerines, paraffins, caustic and acid solutions and other liquid and gaseous fluids used industrially, for other processes, or for fire fighting purposes.
30. **Industrial Piping System** (Consumer's). Any system used by the Consumer for transmission of or to store any fluid, solid, or gaseous substance other than an approved water supply. Such a system would include, but not limited to, all pipes, conduits, tanks, receptacles, fixtures, equipment, and appurtenances to produce, convey, or store substances which are or may be polluted or contaminated.
31. **Interconnection.** A connection between the County's potable water supply system and an uncontrollable source of water, such as a private well. Interconnections are strictly PROHIBITED by this policy and State codes.

32. **Isolation.** The act of confining a localized hazard within a Consumer's water system by installing approved backflow prevention assemblies, or devices. The County of Brunswick may make recommendations, upon facility inspection, as to the usage of isolation devices/assemblies, but does not assume or have responsibility whatsoever for such installations.
33. **Laboratory, Testing** (Approved). Refers to *the Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California (FCCCHR-USC)* or another lab having the equivalent facilities for both the laboratory and field evaluation of the assemblies approved by the AWWA and/or ASSE.
34. **Non-Potable Water.** A water supply which has not been approved for human consumption by the North Carolina, Division of Environmental Health, Public Water Supply Section.
35. **Pollution.** An impairment of the quality of the water to a degree which does not create a hazard to the public health but which does adversely and unreasonably affect the aesthetic qualities of such waters for domestic use.
36. **Potable Water.** Any public potable water supply which has been investigated and approved by the State of North Carolina Division of Environmental Health, Public Water Supply Section. The system must be operating under a valid health permit. In determining what constitutes an approved water supply, the North Carolina Division of Environmental Health, Public Water Supply Section has final judgment as to its safety and potability.
37. **Premises.** A building, complex, golf course, median, or any other location that receives water provided by the County of Brunswick.
38. **Pressure Vacuum Breaker (PVB)** (Approved). A backflow prevention assembly suitable for continuous pressure, to be used to provide protection against backsiphonage.
39. **Public Potable Water System.** Any publicly or privately owned water system operated as a public utility, under a current permit, to supply water for domestic purposes. This system will include all sources, facilities, and appurtenances between the source and the point of delivery (service connection) such as valves, pumps, pipes, conduits, tanks, receptacles, fixtures, equipment, and appurtenances used to produce, convey, treat, or store a potable water for public consumption or use.
40. **Purveyor, Water.** Owner or operator of a public potable water system, providing an approved water supply to the public and permitted by the State of North Carolina to do so.
41. **Reduced Pressure Principle Prevention Assembly (RPZ or RP)** (Approved). An assembly containing two (2) independently acting approved check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves and at the same time below the first check valve. The unit shall include properly located resilient seated test cocks and tightly closing resilient seated shut-off valves at each end of the assembly. This assembly is designed to protect against a non-health (i.e., pollutant) or a health (i.e., contaminant). This assembly shall not be used for backflow protection of sewage or reclaimed water.

42. **Reduced Pressure Principle Detector Assembly (RPDA)** (Approved). A specially designed assembly composed of a line-sized approved reduced pressure principle backflow prevention assembly with a specific bypass water meter and a meter-sized approved reduced pressure principle backflow prevention assembly. The meter shall register in U.S. gallons accurately for only very low rates of flow (up to three gallons per minute) and shall show a registration for all rates of flow. This assembly shall be used on fire protection systems.
43. **Service Connection.** The terminal end of a service connection from the public potable water system, (i.e., where the water purveyor may lose jurisdiction and sanitary control of the water at its point of delivery to the Consumer's water system). If a water meter is installed at the end of the service connection, then the service connection shall mean the downstream end of the water meter.
44. **Thermal Expansion.** Expansion attributed to heating of water in an enclosed container such as a water heater.
45. **Unapproved Water Supply.** A water supply which has not been approved for human consumption by the State of North Carolina.
46. **Used Water.** Any water supplied by a water purveyor from a public potable water system to a Consumer's water system after it has passed through the service connection and is no longer under the control of the water purveyor (County).

E. WATER SYSTEM.

1. The water system shall be considered as made up of two (2) parts: The County's (water purveyor) System and the Consumer's System.
2. The County is permitted as a *treatment* and *supply system* by the State of North Carolina since the County does treat water from a natural source (i.e., well, spring, stream, river, pond, lake, etc.). The County sells some portion of its water to other State-permitted water purveyors. The County's System shall consist of treatment facilities, pumping, storage and distribution including all those facilities of the water system under the complete control of the County, up to the point where the Consumer's System begins (service connection).
3. The source shall include all components of the facilities utilized in the treatment, storage, and delivery of water to the County's distribution system.
4. The distribution system shall include the network of conduits used for the delivery of treated water from the source to the Consumer's System.
5. The Consumer's System shall include those parts of the facilities beyond the termination of the County's distribution system (service connection) which are utilized in conveying potable water to points of use.

- F. RIGHT OF ENTRY.** The Director, or his authorized representative(s), shall have the right to enter any building, structure, or premises during normal business hours to perform any duty imposed upon him or her by this policy. Those duties may include sampling and testing of water, or inspections and observations of all piping systems connected to the public water supply. Refusal to allow entry for these purposes shall result in enforcement action (disconnection of water services, stipulated penalties, etc.).

On request from the Director, the Consumer shall furnish to the County any pertinent information regarding the water supply system on such property where cross-connections, either actual or potential, and backflow are deemed possible.

The Consumer's system should be open for inspection at all reasonable times to authorized representatives from the County to determine whether unprotected cross-connections or other structural or sanitary hazards, including violations of this policy, exist. Refusal to allow entry for these purposes shall result in enforcement action (disconnection of water services, stipulated penalties, etc.). When such a condition becomes known, the Consumer shall be notified, in writing, to disconnect the unprotected cross-connection(s) within a time period established in this policy. The degree of protection required and the period of time required for conformance shall be commensurate with the actual or potential degree of hazard to the public potable water supply system.

1. Cross-connection with *private wells or other unapproved auxiliary water supplies* require immediate disconnection of unapproved source.
2. Cross-connection requiring correction through: (1) elimination; (2) air gap separation; (3) reduced pressure principle backflow prevention assembly (RP) or double check valve assembly (DCVA) for sizes 3/4" through 2" require thirty (30) day maximum conformance period.
3. Cross-connection requiring correction through reduced pressure principle backflow prevention assembly (RP) or double check valve assembly (DCVA) for sizes greater than 2" require one hundred twenty (120) day maximum conformance period.
4. Upon completion of the above requirements, the Consumer shall be required to submit, in writing, notification of compliance to the Director.

- G. BACKFLOW ASSEMBLY INSTALLATION.** An approved backflow prevention assembly shall also be installed, in accordance with manufacturer's installation instructions, on each Consumer's water system at or near the property line or immediately inside the building being served; but, in all cases, before the first branch line leading off the service line wherever the following conditions exist:

1. In the case of premises having an auxiliary water supply which is not or may not be of safe bacteriological or chemical quality and which is not acceptable as an additional source by the State of North Carolina, the public water system shall be protected against backflow from the premises by installing an approved backflow prevention assembly in the service line commensurate with the degree of hazard.

2. In the case of premises on which any industrial fluids or any other objectionable substance is handled in such a manner as to create an actual or potential hazard to the public water system, the public system shall be protected against backflow from the premises by installing an approved backflow prevention assembly in the service line commensurate with the degree of hazard. This shall include the handling of process waters and waters originating from the water purveyor's system which have been subject to deterioration in quality.
3. In the case of premises having: (1) internal cross-connections that can not be permanently corrected or protected against, or (2) intricate plumbing and piping arrangements or where entry to all portions of the premises is not readily accessible for inspection purposes, making it impracticable or impossible to ascertain whether or not dangerous cross-connections exists, the public water system shall be protected against backflow from the premises by installing and approved backflow prevention assembly in the service line commensurate with the degree of hazard.

Ownership, testing, and perpetual maintenance of the backflow prevention assemblies shall be the responsibility of the Consumer. All reduced pressure principle assemblies (RP) and double check valve assemblies (DCVA) shall be installed above ground in a protective enclosure or inside the building, if the building is less than 200 linear feet from the water main serving the Consumer. Pit and/or below grade installations are **PROHIBITED**. The installer shall be responsible to ensure that the assembly is installed and working properly and shall furnish the following information to the Director within five (5) working days after a backflow prevention assembly is installed:

- a. Owners name, address, phone number, and responsible contact.
- b. Assembly location (specific).
- c. Date of installation.
- d. Installer's name, address, and phone number.
- e. Installer's certification number.
- f. Type of assembly.
- g. Manufacturer.
- h. Model number.
- i. Serial number.
- j. *Test results/reports.

*All reduced pressure principle assemblies (RP) and double check valve assemblies (DCVA) are required to be tested following installation by a certified backflow prevention assembly technician (tester).

All commercial and industrial Consumers connected to the public potable water system of the County on or before the effective date of this policy, upon notification from the County, shall install or have installed an approved backflow prevention (containment) assembly, commensurate with the degree of hazard. The period allowed for this installation shall not exceed the following:

<u>Degree of Hazard</u>	<u>Time Frame, days</u>
<u>2" Service or Smaller:</u>	
Low	60
Medium	60
High	30
<u>Service Greater Than 2":</u>	
Low	180
Medium	180
High	120

Submit plans and specifications sealed by a registered engineer to the Director for review and approval. Acquire all necessary permits prior to installation. Upon satisfactory installation of approved backflow prevention assembly and appurtenances, forward a certificate of completion to the Director.

- H. TYPE OF BACKFLOW ASSEMBLY.** The type of backflow prevention assembly to be installed to protect the public potable water supply required by this ordinance shall be commensurate with the degree of, either actual or potential, hazard. Any backflow prevention assembly required herein shall be a make, model, and size approved by the County. The term "*approved backflow assembly*" shall mean an assembly that has been manufactured in full conformance with the standards established by the American Water Works Association (AWWA) entitled:

AWWA/ANSI C501-92 (or subsequent revisions) *Standard for Double Check Valve Backflow Assemblies*;

AWWA/ANSI C11-92 (or subsequent revisions) *Standard for Reduced Pressure Principle Backflow Prevention Assemblies*;

and, have met completely the laboratory and field performance specifications of the *Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California* (FCCCHR-USC) established in:

Specifications of Backflow Prevention Assemblies - Section 10 of the most current edition of the *Manual of Cross-Connection Control*.

- I. TESTING & MAINTENANCE.** It shall be the responsibility of the Consumer at any premise where backflow prevention assemblies are installed to have a field test performed by a certified backflow prevention assembly technician (tester) upon installation and at least once per year for the life of the assembly. In instances where the Director deems the hazard to be great enough he may require field tests at more frequent intervals. These tests shall be at the expense of the Consumer (water user) and shall be performed by a certified technician (tester) approved by the State of North Carolina. It shall be the responsibility of the Director, or his authorized representative, to see that these tests are conducted in a timely manner.

All tests must be completed on or before December 31 of each year. If problems are detected with the backflow prevention assembly(s), it is the responsibility of the Consumer to report these discrepancies to the Director within five (5) working days of detection. These assemblies shall be repaired, overhauled, or replaced at the expense of the Consumer whenever said assembly(s) are found to be defective. Records of such tests, repairs, overhauls, and replacements shall be kept by the Consumer and shall be made available to the County.

All presently installed backflow prevention assemblies which do not meet the requirements of this ordinance but were approved devices for the purposes described herein at the time of the installation and which have been properly maintained, shall, except for the testing and maintenance requirements, be excluded from the requirements of this policy as long as the Director is assured that the affected backflow prevention devices/assemblies will satisfactorily protect the County's water supply system. Whenever the existing device/assembly is moved from the present location or requires more than minimum maintenance or when the Director determines that the maintenance constitutes a hazard to health, the device/assembly in question shall be replaced with an approved backflow prevention assembly meeting or exceeding the requirements of this policy at the Consumer's expense.

When it is not possible to interrupt water service, provisions shall be made for a "*parallel installation*" of backflow prevention assemblies. The Director shall not accept an unprotected bypass around a backflow prevention assembly when the assembly is in need of testing, repair, or replacement.

When repair work is required on any approved backflow prevention assembly, whether determined through testing or routine inspection by the Consumer (owner) or by the County (water purveyor), these repairs shall be completed within a specified period of time commensurate with the degree of hazard at the Consumer's expense. In no case shall this period of time exceed thirty (30) days.

J. CATEGORICAL FACILITIES. Approved backflow prevention assemblies shall be installed on the service connection to any premises that the County has identified as having a potential for backflow, including but not limited to, the following:

1. Amusement Parks.
2. Automotive Plants.
3. Automotive Service Stations (dealerships, repair shops, etc.).
4. Auxiliary Water System:
5. Private Water Supply.
6. "Used Water", "Re-Use Water" and "Industrial Fluids".
7. Bakeries.
8. Beauty Shops/Barber Shops.
9. Beverage Bottling Plants.
10. Breweries.
11. Buildings (hotels, motels, apartments, public and private buildings or other structures having unprotected cross-connections).
12. Buildings of Five (5) or more stories above ground level.
13. Canneries, Packing Houses, and Rendering Plants.
14. Chemical Plants (manufacturing, processing, and compounding or treatment).
15. Chemically Contaminated Water System.
16. Commercial Car Washing Facilities.

17. Commercial Greenhouses.
18. Commercial Laboratories.
19. Commercial Sales Establishments (department stores, malls, etc.).
20. Concrete/Asphalt Plants.
21. Dairies and Cold Storage Plants.
22. Electroplating Processes.
23. Film Laboratories.
24. Fire Systems.
23. Hospitals, Medical Buildings, Sanitariums, Morgues, Mortuaries, Autopsy Facilities, Funeral Homes, Nursing & Convalescent Homes, Medical Clinics and Veterinary Hospitals.
24. Industrial Facilities.
25. Irrigation Systems (lawn, commercial, etc.).
26. Laundries and Dye Works.
27. Metal Manufacturing, Cleaning, Processing, and Fabricating Plants.
28. Mobile Home Parks.
29. Motion Picture Studios.
30. Oil and Gas Production, Storage or Transmission Properties.
31. Painting and Staining Operations Related to Finished Woods and Metals.
32. Paper and Paper Product Plants.
33. Pest Control (exterminating & fumigating).
34. Pharmaceutical Manufacturing.
35. Plating Plants & Facilities.
36. Plastic Molding Facilities.
37. Power Plants.
38. Radioactive Materials or Substances (plants or facilities handling).
39. Restaurants.
40. Restricted, Classified, or Other Closed Facilities.
41. Rubber Plants (natural & synthetic).
42. Sand and Gravel Plants.
43. Schools and Colleges.
44. Swimming Pools.
45. Water Treatment Facilities.
46. Waterfront & Port Facilities & Industries.
47. Wastewater Treatment and Storm Drainage Facilities.
48. Weaving, Spinning Operations.
49. Other premises specified by the Director, or his authorized representative, when the cause can be shown that a potential cross-connection hazard, not enumerated in the above list, exists.

All backflow prevention assemblies and installations shall be subject to approval and inspection by the County.

- K. CONNECTION TO UNAPPROVED WATER SUPPLIES.** No person shall connect or cause to be connected any supply of water not approved by the State of North Carolina to the public potable water supplied by the County. Any such connection allowed by the County must be in conformance with the backflow prevention requirements set forth in this policy.

- L. **FIRE PROTECTION SYSTEMS.** All connections to fire sprinkler systems hereinafter connected with the public water supply system shall be protected with an approved backflow prevention assembly (i.e., double check valve detector assembly, etc.) in conformance with specific standards established by the *American Water Works Association (AWWA)* (or subsequent versions) and the *National Fire Prevention Association (NFPA)* (or subsequent revisions). All fire systems using toxic additives or booster pumping facilities shall be required to be protected with an approved reduced pressure principle detector assembly (RPDA) at the main.

Except for an eminent health hazard as defined herein, as determined by the Director, or his authorized representative, any fire sprinkler system connected with the public potable water system of the County on or before the effective date of this policy, shall have twenty-four (24) months to get into conformance with the provisions of this policy.

- M. **CONTROLLED CROSS-CONNECTIONS (TEMPORARY).** The purpose of this section is to describe an acceptable use of a controlled cross-connection (temporary) between the County's water supply system and a non-potable source (i.e., filling a tank or tanker from a fire hydrant for use other than fire protection). This shall be accomplished through the use of an approved meter and a reduced pressure principle assembly (RP) or an air gap properly installed and maintained so that it will continuously afford the required protection. At no time shall this temporary cross-connection be unprotected.

- N. **ENFORCEMENT.** Any person, firm, or corporation responsible for an installation or action found not to be in compliance with this policy shall be issued a Notice of Violation (NOV) specifying corrective action, if required, enforcement action to be taken by the County, if required, and a specified period of time to achieve compliance, if required.

As provided herein, termination of water service is a remedy available to the County to enforce any of the provisions of this policy. A violation of any of the provisions of this policy shall constitute a misdemeanor, punishable as provided in G.S. Section 14-4, with a fine not to exceed five hundred dollars (\$500).

1. **Direct Cross-Connection** - Any installation which remains in noncompliance after notice is given and the time prescribed in **Section G.3** shall be considered in violation of this policy and shall realize the disconnection of water service(s) until compliance is achieved and/or possible legal action. In addition, any person who shall continue any violation beyond the time limit provided for in the aforementioned NOV and **Section G.3** shall be subject to a penalty in the amount not to exceed one-hundred dollars (\$100) for each violation. Each day in which any violation continues after the offender has been notified of the violation shall be deemed a separate offense.
2. **Indirect Cross-Connection** - Any installation or action found to be in noncompliance of this policy shall be considered in violation of the same. In addition, any person found to be in violation of this policy shall be fined in the amount not to exceed one-thousand dollars (\$1000) for each violation. If the installation or action involves the theft of water said offender shall be charged according to state and local law and shall pay, in full, the cost for the estimated usage (See rate schedule currently in force) to the County.

Enforcement of this program shall be administered by the Director or by an authorized representative.

The County Manager, or his authorized representative, is authorized to make all necessary and reasonable rules and policies with respect to the enforcement of this policy. All such rules and policies shall be consistent with the provisions of this policy and shall be effective upon the date of adoption by the County of Brunswick Board of Commissioners.

O. INSTALLATION OF RAIN SENSOR DEVICES REQUIRED ON NEW AUTOMATIC IRRIGATION SYSTEMS.

a. **Definitions.** The following terms, when used in this section, shall have the meanings indicated below.

1. **Automatic irrigation system** means a device or combination of devices having a hose, pipe, or other conduit installed in the landscape which transmits potable water from Brunswick County, through which said device or combination of devices potable water supplied by Brunswick County is drawn and applied to residential or commercial lawns, landscapes, or greenspace.

2. **Rain sensor** means an automatic device that will override the irrigation cycle of an automatic irrigation system, thus turning it off, when a predetermined amount of rain has fallen. To meet the requirements of this section, a rain sensor shall be adjusted to shut off irrigation systems when up to one-fourth inch of rain has fallen.

b. **Required installation.**

1. **New installation.** From and after May 1, 2008, rain sensors shall be required on all automatic irrigation systems that will receive Brunswick County potable water.

2. **Existing systems.** Property owners with existing irrigation systems installed prior to May 1, 2008, are encouraged but not required to install a rain sensor.

c. **Required maintenance.** All rain sensors shall be adjusted and set so that they automatically shut off the irrigation system after not more than one-fourth inch of rainfall has occurred. All rain sensors shall be installed according to manufacturer's instructions in a location that will provide full exposure to rainfall such that accuracy of operation is assured and shall be maintained in good working condition. No person shall, with the intent of circumventing the purpose of this section, adjust either the rain sensor or irrigation system so that the rain sensor is not able to override and turn off the irrigation system after one-fourth inch of rain has fallen.

d. **Enforcement.** The Public Utilities Director or designee shall be responsible for enforcing this section. Whenever the director determines that a violation of this section exists, the director shall issue a written citation identifying the date, location, and nature of the violation, the person cited, and specifying the penalty and the date by which the penalty must be paid.

e. **Penalties.** Penalties for violation of this Section of the Cross Connection and Backflow Protection Policy are included in Section N of this policy.

The foregoing standard policy is hereby adopted by the County of Brunswick Utility Operations Board and the Board of Commissioners this the 17th day of March, 2008.

Earl Andrews, Chairman
Utility Operations Board
County of Brunswick

William M. Sue, Vice Chairman
Board of County Commissioners
County of Brunswick

Attest:

Debby Gore
Clerk to the Board of Commissioners