

Water Authority of Dickson County

Cross-Connection Control Policy

Section 1. Definitions

Air Gap: A physical separation between the free flowing discharge end of a potable water supply line and an open or non-pressurized receiving vessel.

Approved Air Gap: An air gap separation with a minimum distance of at least twice the diameter of the supply line when measured vertically above the overflow rim of the vessel, but in no case less than one (1) inch.

Approved: Any condition, method, device, procedure accepted by the Tennessee Department of Environment and Conservation, Division of Water Supply, and Water Provider.

Auxiliary Intake: Any piping connection or other device whereby water may be secured from any sources other than from the Water Authority of Dickson County.

Auxiliary Water Supply: Any water supply on or available to the premises other than water supplied by the Water Authority of Dickson County.

Backflow: The reversal of the intended direction of flow of water or mixtures of water and other liquids, gases, or other substances into the distribution pipes of a potable water system from any source.

Backpressure: A pressure in the downstream piping that is higher than the supply pressure.

Backsiphonage: Negative or sub-atmospheric pressure in the supply piping.

Backflow Prevention Assembly: An approved assembly designed to prevent backflow.

Bypass: Any system of piping or other arrangement whereby water may be diverted around a backflow prevention assembly, meter, or any other Water Authority of Dickson County controlled device.

Contamination: The introduction or admission of any foreign substances that causes illness or death.

Contaminant: Any substance introduced into the Water Authority of Dickson County that will cause illness or death.

Cross-Connection: Any physical arrangement whereby public water supply is connected, directly or indirectly, with any other water supply system, sewer, drain, conduit, pool, storage reservoir, plumbing fixture or other device which contains, or may contain, contaminated water, sewage, or other waste or liquid of unknown or unsafe quality which may be capable of contaminating the public water supply as result of backflow caused by the manipulation of valves, because of ineffective check valves or backpressure valves or because of any other arrangement.

Cross-Connection Control Coordinator/Manager: The person who is vested with the authority and responsibility for the implementation of the Cross-Connection Control Program and for the provision of this ordinance/policy.

Customer: Any natural or artificial person, business, industry, or governmental entity that obtains water, by purchase or without charge, from the water provider.

Direct Cross-Connection: An actual or potential cross-connection subject to backsiphonage and backpressure.

Double-Check Detector Assembly: A specially designed assembly composed of line size approved double-check valve assembly, with a bypass containing a water meter and approved double-check valve assembly specifically designed for such application. The meter shall register accurately for very low rates of flow up to 3 gallons per minute and shall show a registration for all rates of flow. This assembly shall only be used to protect against non-health hazards and is designed primarily for use on fire sprinkler systems.

Double-Check Valve Assembly: An assembly of two internally loaded check valves, either spring loaded or internally weighted, installed as a unit between tightly closing resilient seated shutoff valves and fitted with properly located resilient seated test cocks. This type of device shall only be used to protect against non-health hazard pollutants.

Failed: The status of a backflow prevention assembly determined by a performance evaluation based on the failure to meet all minimums set forth by the approved testing procedure.

Fire System Classifications Protection: The classes of fire protection systems, as designated by the American Water Works Association "M14" for cross-connection control purposes based on water supply source and the arrangement of supplies, are as follows:

Class 1: Direct connection to the public water main only; no pumps, tanks, or reservoirs; no physical connection from other water supplies; no antifreeze or other additives of any kind; all sprinkler drains discharging to the atmosphere, dry well or other safe outlets.

Class 2: Same as Class 1, except booster pumps may be installed in connection from the street mains.

Class 3: Direct connection to public water supply mains in addition to any one or more of the following: elevated storage tanks; fire pumps taking suction from above ground covered reservoirs or tanks; and pressure tanks.

Class 4: Directly supplied from public water supply mains, similar to Class 1 and Class 2, with and auxiliary water supply dedicated to fire department use and available to premises, such as an auxiliary supply located within 1700 feet of the pumper connection.

Class 5: Directly supplied from public water supply mains and interconnection with auxiliary supplies such as pumps taking suction from reservoirs exposed to contamination, or from rivers, ponds, wells or industrial water systems; where antifreeze or other additives are used.

Class 6: Combined industrial and fire protection systems supplied from the public water mains only, with or without gravity storage or pump suction tanks.

Hazard, Degree of: A term derived from evaluation of the potential risk to public health and the adverse effect of the hazard upon the Water Authority of Dickson County.

Hazard, Health: A cross-connection or potential cross-connection involving any substance that could, if introduced in the public water supply, caused death, illness, and spread disease also known as a **High Hazard**.

Hazard, Plumbing: A cross-connection in a customer's potable water system plumbing that is not properly protected by an approved air gap or backflow prevention assembly.

Hazard, Non-health: A cross-connection or potential cross-connection involving any substance that would not be a health hazard but would constitute a nuisance or be aesthetically objectionable if introduced into the public water supply also known as **Low Hazard**.

Indirect Cross-Connection: An actual or potential cross-connection subject to backsiphonage only.

Industrial Fluid: Any fluid or solution that may be chemically, biologically, or otherwise contaminated or polluted in a form or concentration that could constitute a health, system, pollution, or plumbing hazard if introduced into the public water supply. This shall include, but is not limited to: polluted or contaminated water; all type of process water or used water originating from the Water Authority of Dickson County and that may have deteriorated in sanitary quality; chemicals; plating acids and alkalis; circulating cooling water connected to an open cooling tower; cooling towers that are chemically or biologically treated or stabilized with toxic substance; contaminated natural water systems; oil, gases, glycerin, paraffin, caustic, and acid solutions, and other liquids or gases used in industrial processes, or for fire purposes.

Inspection: An on-site evaluation of an establishment to determine if backflow prevention assemblies are needed by the customer to protect the Water Authority of Dickson County from actual or potential cross-connections.

Interconnection: Any system of piping or other arrangement whereby a public water supply is connected directly with a sewer, drain, conduit, or other device, which does, or may carry sewage or not.

Passed: The status of a backflow prevention assembly determined by a performance evaluation in which the assembly meets all minimums set forth by the approved testing procedure.

Performance Evaluation: An evaluation of an approved Double-Check Valve Assembly or Reduced Pressure Principle Assembly (including approved Detector Assemblies) using the latest approved testing procedures in determining the status of the assembly.

Pollutant: A substance in the Water Authority of Dickson County that would constitute a non-health hazard and would be aesthetically objectionable if introduced into the public water supply.

Pollution: The presence of a pollutant or substance in the Water Authority of Dickson County that degrades its quality so as to constitute a non-health hazard.

Potable Water: Water that is safe for human consumption as prescribed by Tennessee Department of Environment and Conservation, Division of Water Supply.

Public Water Supply: An entity that furnishes potable water for general use and which is recognized as the public water supply by Tennessee Department of Environment and Conservation, Division of Water Supply.

Pressure Vacuum Breaker Assembly: An assembly consisting of one or two independently operating spring loaded check valve(s) and an independently operating spring loaded air inlet valve located on the discharge side of the check valve(s), with tightly closing shutoff valve(s) on each side of the check valves and properly located test cocks for testing valves. This assembly is approved for internal use only and is not approved for premise isolation by the State of Tennessee.

Water Authority of Dickson County: A water system furnishing water to the public for general use which is recognized as a public water supply by the State of Tennessee.

Reduced Pressure Principle Assembly: An assembly consisting of two independently acting approved check valves together with hydraulically operating, mechanically independent, pressure differential relief valve located between the check valves and below the first check valve. These units shall be located between two tightly closing resilient seated shutoff valves as an assembly and equipped with properly located resilient seated test cocks.

Reduced Pressure Principle Detector Assembly: A specially designed assembly composed of a line-size approved reduced pressure principle backflow prevention assembly with a bypass containing a water meter and approved reduced pressure principle backflow prevention assembly specifically designed for such application. The meter shall register accurately for very low flow rates of flows up to 3 gallons per minute and shall show registration for all flow rates. This assembly shall be used to protect against non-health and health hazards and used for internal protection.

Service Connection: The point of delivery to the customer's water system; the terminal end of a service connection from the Water Authority of Dickson County where the water department loses jurisdiction and control over the water. "Service Connection" shall include connections to fire hydrants and all other temporary or emergency water service connections made to the Water Authority of Dickson County.

State: The State of Tennessee, Tennessee Department of Environment and Conservation, Division of Water Supply.

Survey: An evaluation of a premise by a water system performed for the determination of actual or potential cross-connection hazards and the appropriate backflow prevention needed.

Water System: The water system operated shall be considered as made up of two (2) parts, the utility system and the customer system.

- A. The utility system shall consist of the facilities for the production, treatment, storage, and distribution of water, and shall include all those facilities of the water system under the complete control of the water department, up to the point where the customer's system begins (i.e., downstream of the water meter);
- B. The customer system shall include those parts of the facilities beyond the termination of the water department distribution system that are utilized in conveying water to the point of use.

Section 2. Compliance with TCA

The Water Authority of Dickson County is to comply with Section 68-221-711 of the Tennessee Code Annotated, as well as the Rules of Public Water Systems, legally adopted in accordance with this policy/ordinance, which pertain to cross-connections, auxiliary intakes, bypasses, and interconnections, and establish an effective, ongoing program to control these undesirable water uses.

Section 3. Regulation

No person shall cause a cross-connection, auxiliary intake, bypass, or interconnection to be made, or allow one to exist for any purpose whatsoever unless the construction and operation of same has been

approved by the Tennessee Department of Environment and Conservation and the operation of such cross-connections, auxiliary intake, bypass, or interconnection is at all times under the direct supervision of the Cross-Connection Control Coordinator of Water Authority of Dickson County.

- A. No water service connection to any premise shall be installed or maintained by the Water Authority of Dickson County unless the water supply is protected as required by this policy/ordinance. Service of water to any premises shall be discontinued by the Water Authority of Dickson County if a backflow prevention assembly required by this policy is not properly installed, tested, and/or maintained; or if it is found that a backflow prevention assembly has been removed, bypassed, or if an unprotected cross-connection exists on the premises. Service shall not be restored until such conditions or defects are correct.
- B. Prior to execution of any work order for a new customer, or for any change in service to an existing customer, notification shall be given to the office of the Cross-Connection Control. Inspectors from the Cross-Connection Control Office shall make immediate determination in writing to the customer of the type of backflow prevention assembly needed. Water service shall not be established or maintained until all necessary backflow prevention assemblies are installed.
- C. It shall be unlawful for any person to cause a cross-connection to be made or allow one to exist for any purpose whatsoever unless the construction and operation of same have been approved by the Tennessee Department of Environment and Conservation, and the operation of such cross-connection is at all times under the direction of the management of the Water Authority of Dickson County.
- D. If, in the judgment of the Cross-Connection Manager/Coordinator or designee, an approved backflow prevention assembly is required at the water service connection to a customer's premises, or at any point(s) within the premises, to protect the potable water supply, the manager shall compel the installation, testing, and maintenance of the required backflow prevention assembly(s) at the customer's expense.
- E. An approved backflow prevention assembly shall be installed on each commercial water service line to a customer's premises 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.
- F. For new installations, the manager or his designee shall inspect the site and/or review plans in order to assess the degree of hazard and to determine the type of backflow prevention assembly, if any, that will be required, and to notify the owners in writing of the required assembly and installation criteria. All required assemblies shall be installed and operational prior to initiation of water service.
- G. For existing premises, personnel from the Water Authority of Dickson County can conduct inspections and evaluations, and shall require correction of violations in accordance with the provisions of this policy/ordinance.
- H. For existing installations, the Cross-Connection Manager/Coordinator may cause water service to be discontinued until such time as the customer complies with all requirements of state law and this policy/ordinance.
- I. For new commercial or industrial construction or renovation of a commercial or industrial property, the Cross-Connection Coordinator/Manager or inspector shall inspect the site and

review plans in order to determine the type(s) of backflow prevention assembly and notify the owner(s) in writing the type of required assemblies. Such assemblies shall be tested within one to three days depending upon connection and risk.

- J. The customer shall install the approved assemblies at their expense. Failure, refusal, or inability on the part of the customer to install, and maintain such an assembly shall be cause for discontinuance of, or refusal of, water service to the premise until such requirements are satisfactorily met.
- K. No installation, alteration or change(s) shall be made to any backflow prevention assembly connected to the Water Authority of Dickson County without first securing permission from the Cross-Connection Manager/Coordinator.
- L. All backflow prevention assemblies will inspected after installation for compliance with all requirements of this policy. Failure to meet all installation and testing requirements shall be cause for discontinuance of, or refusal of, water service to the premises until such requirements are satisfactorily met.
- M. It shall be unlawful to install or allow any unprotected takeoffs from the water service line ahead of any meter or backflow prevention assembly located directly after the service connection to a customer's water system.

Section 4. Statement Required

That any person whose premises are supplied with water from Water Authority of Dickson County, and who also has on the same premises a separate source of water in an uncovered or unsanitary storage reservoir from which the water stored therein is circulated through a piping system, shall file with Water Authority of Dickson County a statement of the nonexistence of unapproved or unauthorized cross-connections, auxiliary intakes, bypasses, or interconnection. Such statement shall also contain an agreement that no cross-connection, auxiliary intake, bypass, or interconnection will be permitted upon the premises.

Section 5. Applicability

The requirements contained herein shall apply to all customers and premises of Water Authority of Dickson County, and is hereby made a condition required to be met before water service is provided to any customer. This policy shall be strictly enforced since it is essential for the protection of the public water supply against contamination and pollution.

Section 6. Inspections/Surveys

The Cross-Connection Coordinator shall inspect all properties served by the public water supply where cross-connections with the public water supply are deemed possible. The frequency of inspections and reinspections based on potential health hazards involved shall be established by the Cross-Connection Coordinator in accordance with guidelines acceptable to the Division of Water Supply.

Right of Entry

- A. The Cross-Connection Manager/Coordinator or designee shall have the right to enter at any reasonable time any property served by a connection to the Water Authority of Dickson County for the purpose of inspecting the piping system therein for cross-connections, auxiliary intakes,

bypasses, or interconnections. On request, the owner, lessee, or occupant or any property so served shall furnish any pertinent information regarding the piping system on the property. The refusal of such information or refusal of access, when requested, shall be deemed as evidence of the presence of connections.

- B. When cross-connections, other structural or sanitary hazards, or any violation of this becomes known, the Cross-Connection Manager/Coordinator or designee may deny or discontinue service to the premises by providing for a physical break in the service line until the customer has corrected the conditions(s) in conformance with this policy/ordinance.

Section 7. Backflow Prevention Determination

An approved backflow prevention assembly shall be installed on each service line to a customer's premise and in all cases, before the first branch line leading off the service line, if it is impractical or easily altered to provide an effective air gap separation, when any of the following conditions exist:

- A. All premises listed as High Risk High Hazard including industrial fluids, sewage, or any other non-potable substances are handled in such a manner as to create actual or potential health hazard to the water system.
- B. All premises listed with actual or potential cross-connections as listed in approved plan criteria list. (See attached appendage.)
- C. Premises having auxiliary water supply, including but not limited to a well, cistern, spring, pond, river, or creek that is not, or may not be, of safe bacteriological or chemical quality and that is not acceptable as an additional source by the Cross-Connection Control Coordinator or designee. An inspection can be performed and a well user agreement can be signed if no cross-connections with the Water Authority of Dickson County in place of having a backflow prevention assembly.
- D. The plumbing from a private well or other water supply entering the building served by the public water supply, or is connected, directly or indirectly, to the public water supply.
- E. The owner or occupant of the premises cannot, or is not willing to demonstrate that the water use and protective features of the plumbing are such that frequent alterations are made to the plumbing.
- F. The nature and mode of operation within the premises is such that frequent alterations are made to the plumbing.
- G. The nature of the premises is such that the use of the structure may change to a use wherein backflow prevention is required.
- H. There is likelihood that protective measures may be subverted, altered, or disconnected.
- I. Any premises having service and fire flow connections, most commercial and educational buildings, construction sites, all industrial and medical facilities, lawn irrigation systems, public or private swimming pools, private fire hydrant connections used by any fire department in

combating fires, photographic laboratories, standing ponds or other bodies of water, auxiliary water supplies, and wastewater treatment plants.

- J. Any premises having fountains, water softeners or other point of use treatment systems hot tubs or spas, or other type(s) of water using equipment.
- K. Premises otherwise determined by the Cross-Connection Control Coordinator or designee to create an actual or potential hazard to the Water Authority of Dickson County.
- L. In the case of any premises where there is any material dangerous to health that is handled in such a fashion as may create an actual or potential health hazard to Water Authority of Dickson County, the Water Authority of Dickson County shall be protected by an air gap separation (premises isolation only, at the discretion of water provider to allow) or a reduced pressure principle backflow prevention assembly. The following premises, where such conditions may exist, include but are not limited to: wastewater treatment plants, wastewater pumping stations, chemical manufacturing plants, hospitals, mortuaries, funeral homes, and metal plating operations, and livestock and animal operations (chicken houses, CAFOs, etc).
- M. In the case of any premises where, because of security requirements or other prohibitions or restriction it is impossible or impractical to make a complete cross-connection survey, the Water Authority of Dickson County shall be protected against backflow from the premises by either an air gap separation (at the discretion of the water provider) or reduced pressure principle assembly on each service line to the premises.
- N. A backflow prevention assembly shall be installed on each fire service line at 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 any of the following conditions exist:
 - 1. Class 1, 2, and 3 fire protection systems shall require at minimum a double-check valve (detector) assembly; provided however, that a reduced pressure principle (detector) shall be required:
 - a. Underground fire sprinkler pipelines are parallel to and within ten (10) feet horizontally of pipelines carrying waste water or significantly toxic wastes; or
 - b. Premises having unusually complex piping systems;
 - c. The pumpers connecting to the system have corrosion inhibitors or other chemical added to the tanks of the fire trucks;
 - d. The piping system(s) has corrosion inhibitors or other chemical added to prevent freezing;
 - e. An auxiliary water supply exists with 1,700 feet of any likely pumper connection.
 - 2. Class 4, Class 5, Class 6 fire protection systems shall require an air gap, or a reduced pressure principle assembly (detector) as determined by the Cross-Connection Control Manager/Coordinator or designee.

3. Where a fire sprinkler system is installed on the premises, a minimum of a double-check valve assembly (detector) shall be required.
 4. Where a fire sprinkler system uses chemicals, such as liquid foam, to enhance fire suppression a reduced pressure principle detector assembly shall be required.
 5. The Cross-Connection Control Manager/Coordinator may require internal or additional backflow prevention devices where it is deemed necessary to protect potable water supplies within the premises.
- O. In the case of any premises with an auxiliary water supply as set out in Section 10 and not subject to any of the following rules, the Water Authority of Dickson County shall be protected by an air gap separation or a reduced pressure principle assembly.
- P. Double-Check Valve Assemblies (and Detectors) may **only** be used for Class 1-3 fire protection systems (at the discretion of water provider to even allow).
- Q. In the case of any premises where there is any material dangerous to health that is handled in such a fashion as may create an actual or potential hazard to Water Authority of Dickson County, the Water Authority of Dickson County shall be protected by a reduced pressure principle backflow prevention assembly. The following premises, where such conditions may exist, include but are not limited to: wastewater treatment plants, wastewater pumping stations, chemical manufacturing plants, hospitals, mortuaries, funeral homes, and metal plating operations.
- R. In the case of any premises where there are uncontrolled cross-connections, either actual or potential, the Water Authority of Dickson County shall be protected by a reduced pressure principle assembly (detector) or air gap separation (at the discretion of water provider) assembly on each service line to the premises.
- S. In the case of any premises where, because of security requirements or other prohibitions or restriction it is impossible or impractical to make a complete cross-connection survey, the Water Authority of Dickson County shall be protected against backflow from the premises by either an air gap separation (at the discretion of the water provider) or reduced pressure principle assembly on each service line to the premises.
- T. In the case of any premises where toxic substances are present that could pose an undue health hazard, the Cross-Connection Control Manager/Coordinator or designee may require an air gap separation or reduced pressure principle assembly at the service connection to protect the Water Authority of Dickson County. In making this determination, the Cross-Connection Control Manager/Coordinator or his designee shall consider the degree of hazard based on criteria list in approved plan.

Section 8. Approved Backflow Prevention Assemblies and Methods

- A. All backflow prevention assemblies shall be fully approved and listed as acceptable by the State of Tennessee as to manufacture, model, size, application, orientation, and alterations. The assembly must have a status of **Passed** determined by performance evaluations to suffice as an

approved backflow prevention assembly. The method of installation of backflow prevention devices shall comply with installation criteria set forth by this policy/ordinance and the State of Tennessee. Installation shall be at the sole expense of the owner of the owner or occupant of the premises.

- B. The type of protective assembly required by this Policy shall depend on the degree of hazard that exists. Reduced Pressure Principle Assemblies (Detector) may be used for health hazards and non-health hazards. Double-Check Valve Assemblies (Detector) may only be used for non-health hazards and is limited to Class 1-3 fire systems only.
- C. Pressure vacuum breakers, spill-resistant vacuum breakers, and atmospheric vacuum breaker are not allowed for premise isolation and will not satisfy the requirements of this Policy/Ordinance for adequate backflow prevention due in part to the inability to protect against backpressure.

Section 9. Backflow Prevention Assembly Installation Requirements

Minimum acceptable criteria for installation of backflow prevention assemblies shall include the following:

- A. All backflow prevention assemblies shall be installed at minimum in the approved orientation as indicated by the latest Approved List.
- B. All new assemblies installed must be on the Approved Assemblies List maintained by the Division of Water Supply and existing assemblies must have status of approved.
- C. Installation of assemblies shall be performed by person granted authority by the water provider. All backflow prevention assemblies installed fire protection systems must be performed by persons possessing a fire sprinkler contractor license. Evidence of current certifications/license must be on file with the Cross-Connection Control Manager/Coordinator before any installation or testing of the devices can be performed.
- D. All assemblies shall be installed in accordance with the manufacturer installation instructions and by the State of Tennessee installation guide, from the State Manual or policies on cross-connection control, unless such instructions are in conflict with this policy, in which case the policy/ordinance shall control, and shall possess all test cocks and fittings required for testing the assembly. All test cocks will be fitted with adapters and all fittings shall permit direct connection to test kits used by the department.
- E. The entire assembly including test cocks and valves shall be easily accessible for testing and repair and shall meet all confined space requirements of OSHA/TOSHA.
- F. Reduced Pressure Backflow Prevention Assemblies shall be located so that the relief valve discharge port is a minimum of twelve (12) inches, plus nominal diameter of the supply line, above the floor surface. The maximum height above the floor surface shall not exceed sixty (60) inches.
- G. Clearance of devices from wall surfaces or other obstructions shall be a minimum of six (6) inches; or if a person must enter the enclosure for repair or testing, the minimum distance shall be twenty-four inches.

- H. Devices shall be protected from freezing, vandalism, mechanical abuse, and from any corrosive, sticky, greasy, abrasive, or other damaging substance.
- I. Devices shall be positioned where discharge from a relief port will not create undesirable conditions. An approved air gap shall separate the relief port from any drainage system. Such air-gap shall not be altered without the specific approval of the department.
- J. Devices shall be located in an area free from submergence or flood potential and cannot be placed in a pit.
- K. All devices shall be adequately supported to prevent sagging.
- L. An approved strainer, fitted with a test cock, shall be installed immediately upstream of all backflow prevention assemblies or shut-off valve, except on fire lines, using only non-corrosive fittings (e.g., brass or bronze) in the device assembly.
- M. Gravity drainage is required on all installations. Below ground installations shall not be permitted for Reduced Pressure Principle Assemblies (detectors).
- N. Fire hydrants drains shall not be connected to the sanitary sewer, and fire hydrants shall not be installed in such manner that backsiphonage or backflow through the drain may occur.
- O. Where jockey (low volume-high pressure) pumps are utilized to maintain elevated pressure, as in fire protection system, the discharge of the pump shall be on the downstream side of any check valve or backflow prevention assembly. Where the supply for the jockey pump is taken from the upstream supply side of the check valve or backflow prevention assembly, a backflow prevention assembly of the same type(s) required on the main line shall be installed on the supply line.
- P. Fixed position, high volume fire pumps shall be equipped with suction limiting control to modulate the pump if the residual line pressure reaches 20 psi. If line pressure drops below 20 psi, the pump will shut off to protect the distribution system. This shut off system must be tested annually for proper operation and report of the test must be sent to the office of Cross-Connection Control.

Section 10. Existing Backflow Prevention Assemblies

- A. All presently installed backflow prevention assemblies which were previously acceptable to the State of Tennessee that complies with installation, testing, and maintenance requirements of this policy/ordinance and in the sole discretion of the Cross-Connection Control Coordinator or designee adequately protect the Water Authority of Dickson County from backflow and that were approved assemblies for the purpose described herein at the time of installation may be retained in service.
- B. Location or space requirements shall not be cause for re-location or replacement of any backflow prevention assembly that is presently installed in a vertical run of pipe shall be replaced, reinstalled, in an approved manner in a horizontal run of pipe.

- C. Wherever an existing assembly is moved from the present location, or when the inspector finds that the conditions of the assembly constitutes a health hazard, the unit shall be replaced by the backflow prevention assembly meeting the requirements of this policy.

Section 11. Assembly Performance Evaluations and Testing

- A. All assemblies used to protect the Water Authority of Dickson County must be tested every 12 months. In those instances where the Cross-Connection Coordinator deems the hazard to be great enough, performance evaluation may be required at more frequent intervals.
- B. Any assembly not tested with 12 month period will be deemed not approved and have a status of **Failed**. The customer will be sent notification of that the assembly is not in compliance with this ordinance or policy
- C. All assemblies must be deemed **Passed** for each initial and subsequent annual performance evaluations to satisfy as approved backflow prevention assembly.
- D. All assemblies will be tested by backflow prevention assembly tester possessing a **valid (see definition) Certificate of Competency in Testing and Evaluation Backflow Prevention Assemblies** issued by the State of Tennessee.
- E. All performance evaluation must be performed with an annually certified test kit.
- F. Certifications for test kits are valid for one year after certification is performed. If the test kit is not recertified after one year, it is deemed expired.
- G. Test kits must be certified annually and the backflow prevention assembly tester must show proof of certification from manufacturer-approved entities. No performance evaluations will be accepted from a backflow prevention assembly tester with an expired test kit certification.
- H. Proof of annual test kit certification and Certificate of Competency must be kept on file for each tester by water provider.
- I. Backflow Prevention Assembly Testers must test and evaluate according to the latest Division of Water Supply's latest approved procedures for Reduced Pressure Principle Assembly and the Double-Check Valve Assembly.
- J. If any test does not meet the minimum requirements set forth in the approved testing procedure, the assembly is deemed **Failed** and does not suffice as an approved backflow prevention device. If conditions around the assembly do not allow the assembly to be tested, the assembly fails the assembly performance evaluation and is marked **Failed** on test report. (Examples would include assembly is submerged, test cocks missing or plugged, relief valve continually discharging).
- K. Backflow Prevention Assemblies are deemed **Passed** if all parts of the performance evaluation meet the minimum requirements in the approved testing procedure.
- L. Each location requiring an assembly will have a documented backflow prevention assembly, if the assembly at the address cannot be identified or is not the same, the water provider will be notified and a determination of which assembly is used for protection of the water system. (All areas that need protection will be listed by address and location along with the serial no. of device)

- M. Test reports must be completely and accurately documented and the appropriate evaluation (**Passed** or **Failed**) determined from testing procedure. Any test report that is not recorded completely in the sections pertinent to the results of the performance evaluation tests will not be accepted by the Water Authority of Dickson County.
- N. All performance evaluations on file will be recorded on a Tennessee Department of Environment and Conservation approved test report.
- O. Assemblies must be tested when installed and after every repair. Backflow prevention assemblies on lawn irrigation systems must be tested when assemblies are placed in service after winterization (to prevent testing just prior to winterization). If lawn irrigation backflow assemblies are taken removed to winterize the system, upon startup of the system, the assemblies must be retested.
- P. Failure to maintain a backflow prevention assembly that is deemed **Passed** shall be grounds for discontinuance of water service. The removal, bypassing, or altering of a protective device or installation, without the approval of the Cross-Connection Control Coordinator or designee, thereof so as to render a device ineffective shall constitute grounds for discontinuance of water service. Water service to such premises shall not be restored until the customer has corrected or eliminated such conditions or defects to the satisfaction this ordinance/policy and the Cross-Connection Control Coordinator or designee.
- Q. Water Authority of Dickson County shall require the occupant of the premises to keep the backflow prevention assembly working properly and a status of **Passed**. Repairs shall be made by qualified personnel acceptable to Water Authority of Dickson County within the time limits set forth by this policy. Expenses of such repairs shall be borne by the owner or occupant of the premises. The failure to maintain a backflow prevention assembly in proper working order and a status of **Passed** shall be grounds for discontinuance of water service.
- R. The backflow prevention assembly must be tested after every repair and have a status of **Passed** to be in compliance with this policy.
- S. Cross-Connection Control Coordinator or designee shall have the right to inspect and test any assemblies whenever it is deemed necessary. Water service shall not be disrupted to the assembly without the knowledge of the occupant of the premises.
- T. Provision should be made for fire sprinkler system testing; if third party testing is allowed, no problem, however if the utility or municipality should elect to test all assemblies, a allowance should be given for fire sprinkler contractors to test in accordance to Division of Fire Prevention regs. Those with fire sprinkler license will also be required to have a Valid Certificate of competency and all other requirements set forth by this policy/ordinance
- U. Any backflow prevention assembly tester found by the water system to be negligent in performing testing procedures or falsifying documentation in regards to a backflow prevention assembly will not be allowed continued approval to submit test reports. The water system may allow the

backflow prevention assembly tester to perform testing at a later date, at the discretion of the Cross-Connection Control Manager/Coordinator or designee.

- V. Backflow prevention assembly testers must have approval from the Water Authority of Dickson County water system before any test reports are accepted.
- W. All performance evaluations and repairs shall be at the expense of the customer and shall be performed by backflow prevention assembly testers that satisfy all requirements of this ordinance/policy.
- X. Original records of evaluations and repairs shall be supplied to the Cross-Connection Control Manager/Coordinator or designee for retention.

Section 12. Corrections of Violations

- A. Any customer having cross-connections, auxiliary intakes, bypasses, or interconnection(s) or other conditions in violation of this policy shall, after a thorough investigation of existing conditions and an appraisal of the time required, complete the work within the time designated by the Cross-Connection Control Coordinator or designee, but in no case shall the time for correction exceed ninety (90) days for High and Low Hazards or fourteen (14) days for High Risk High Hazards.
- B. Failure to comply with any order of the Cross-Connection Control Coordinator or designee within the time set out therein shall result in the termination of water service.
- C. Where cross-connections, auxiliary intakes, bypasses, or interconnections are found to constitute a high risk high hazard, the public water supply (criteria will be needed), the Cross-Connection Control Coordinator or designee shall require prompt corrective action (within 14 days) to be taken to eliminate the threat. Expeditious steps shall be taken to disconnect the Water Authority of Dickson County from the customer's piping systems unless the extreme hazard is corrected immediately.
- D. Failure to correct conditions threatening the safety of the Water Authority of Dickson County as prohibited by this policy or Tennessee Code Annotated 68-221-711 within the time limits set by the Cross-Connection Control Coordinator or designee or this policy, shall be cause for denial or termination of water service. If proper protection is not provided after times set forth in this policy/ordinance, the Cross-Connection Control Coordinator or designee shall give the customer written notification that water service is to be discontinued, and thereafter physically separate the Water Authority of Dickson County from the customer's system in such a manner that the two systems cannot be connected by an unauthorized person.
- E. In the event that a backflow prevention assembly is deemed Failed (Initial or Annual Performance Evaluation), failure to install backflow prevention assemblies as requested by the WADC or there are deficiencies in the installation from failure to conform to the installation criteria specified in this ordinance, or from deterioration, then the Cross-Connection Control Coordinator or designee shall issue a written notice of failure or deficiency (within 30 days).

Section 13. Non-Potable Supplies

- A. Any water outlet connected to auxiliary water sources, industrial fluid systems, or other piping containing non-potable liquids or gases, which could be used for potable or domestic purposes, shall be labeled in a conspicuous manner as:

WATER UNSAFE FOR DRINKING

- B. The minimum acceptable sign shall have black letters at least one inch (1) high on red background.
- C. Color coding of piping in accordance with Occupational Safety and Health Act guidelines may be required in locations where, in the judgment of the inspector, such color coding is necessary to identify and protect the potable water supply.

Section 14. Conflicting Provisions

If any provision of this ordinance/policy is found to conflict with any provision of any other ordinance/policy, then the provision of this ordinance shall control. That should any part or parts of this ordinance/policy be declared invalid for any reason, no other part, or parts, of this ordinance shall be affected thereby.

Section 15. Penalties

Any person responsible for a violation of this policy/ordinance may be subject to a civil penalty of not less than \$10.00 nor more than \$50.00. Each day a violation occurs shall constitute a separate offense. In addition to the foregoing fines and penalties, the Cross-Connection Control Coordinator or designee shall discontinue the public water service at any premises upon connection and service shall not be restored until such cross-connection, auxiliary intake, bypass, or interconnection has been discontinued.

Independent of and in addition to fines penalties imposed, the Cross-Connection Control Coordinator may discontinue the public water supply service to any premises upon which there is found to be a cross-connection, auxiliary intake, bypass, or interconnection; and service shall not be restored until such cross-connection, auxiliary intake, bypass, or interconnection has been eliminated.

Section 16. Responsibility for Water System

- A. Notwithstanding any provisions of a plumbing code adopted by units of local government having jurisdiction, the Cross-Connection Control Manager/Coordinator or designee shall be responsible for protecting the water system from contamination or pollution due to implementation and enforcement of this policy. Such authority shall extend beyond service connection to whatever extent is necessary to meet the requirements of this policy/ordinance.

- B. The authority to terminate water service for violation of any provision of this policy shall rest solely with the Cross-Connection Control Coordinator/Manager, the assistant or designee shall have authority to take action to protect public health and safety.
- C. This section shall not be construed to prevent other officers or employees of the Water Authority of Dickson County terminating water service for failure to pay for water service or for violation of any other provision of Water Authority of Dickson County.

Section 17. Inspection and Testing Fees

- A. Fees for initial or annual certification of a backflow prevention assembly may be published by the Water Authority of Dickson County based on the recommendation of the Cross-Connection Control Manager/Coordinator to reflect the cost of processing such certification.
- B. In the event that a backflow prevention assembly is deemed Failed after the Initial and Annual Performance Evaluations, or there are deficiencies in the installation either from failure to conform to the installation criteria specified in this ordinance/policy, or from deterioration, then the Cross-Connection Control Manager/Coordinator or designee shall issue a written notice of failure or deficiency.

The Cross-Connection Control Manager/Coordinator may waive any fees and/or cost that should be appropriately relieved.

Section 18. Thermal Expansion Control

A device for the control of thermal expansion shall be installed on the customer's water system where the thermal expansion of the water in the system will cause the water pressure to exceed the pressure setting of the pressure relief valve of the water heater. The thermal expansion device shall control the water pressure to prevent the pressure relief valve of the water heater from discharging. Installing a backflow prevention device will create a closed system on customer's water system. The customer will be aware of this and it will be the customer's responsibility to install the thermal expansion device. Information about thermal expansion will be provided to customer.

Section 19. Water Heater Temperature-Pressure Relief Valves

All storage water heaters operation above atmospheric pressure shall be provided with an approved, self-closing (levered) pressure relief and temperature valve or combination thereof, except for nonstorage instantaneous heaters. Such valves shall be installed in the shell of the water heater tank or may be installed in hot water outlet, provided the thermo-bulb extends into the shell of the tank. Temperature relief valves shall be so located in the tank as to be actuated by water in the top 1/8th of the tank served.

For installations with separate storage tank, said valve shall be installed on the tank and there shall not be any type of valve installed between the water heater and the storage tank. There shall not be a check valve or shut off valve between a relief valve and the heater or tank which it serves. The relief valve shall not be used as a means of controlling thermal expansion.

Section 20. Safety Standards-Duplicate Equipment in Parallel Required

Where the use of water is critical to the continuation of normal operations or protection of life, property, or equipment, duplicate units shall be provided to avoid the necessity of discontinuing water service to test or repair a backflow prevention assembly. Until such time as a parallel unit has been installed where the continuance of service is critical, the Cross-Connection Control Manager/Coordinator or designee shall notify the occupant of the premises, in writing, of plans to interrupt water service and arrange for a mutually acceptable time to test or repair the assembly. Cross-Connection manager will determine if duplicate system is needed depending on the information provided by the customer and survey of the premises.

Section 21. Effective Date

This policy/ordinance shall take effect from and after its passage and publication as the law directs, the public welfare requiring it.

Approved this 12th day of MAY, 2008

Section 22. Approval Signatures

State Approval: _____

Date: 6/23/08

Board Approval: _____

Date: 5/12/08

Board Chairman
Signed: _____

Date: 5/12/08

Executive Director
Signed: Danarak Mudey

Date: 5/12/08

Installation Criteria

Installation Criteria The minimum acceptable criteria for the installation of reduced pressure backflow prevention devices, double-check valve assemblies or other backflow prevention devices requiring regular inspection or testing shall include the following.

- (a) All required devices shall be installed in accordance with the provisions of this policy, by a person approved by the Water Authority of Dickson County who is knowledgeable in the proper installation. Only licensed sprinkler contractors may install, repair or test backflow prevention devices on fire protection systems.**
- (b) All devices shall be installed in accordance with the manufacturer's instruction and shall possess appropriate test cocks, fittings and caps required for the testing of the device. All fittings shall be of brass construction, unless otherwise approved by the Water Authority of Dickson County, and shall permit direct connection to department test equipment.**
- (c) The entire device, including valves and test cocks, shall be easily accessible for testing and repair.**
- (d) All Devices shall be placed in the upright position in a horizontal run pipe.**
- (e) Device shall be protected from freezing, vandalism, mechanical abuse and from any corrosive, sticky, greasy, abrasive or other damaging environment.**
- (f) Reduced Pressure Backflow Prevention devices shall be located a minimum of twelve (12) inches plus the nominal diameter of the device above either; 1) the floor, 2) the top of opening(s) in the enclosure or 3) maximum flood level, whichever is higher. Maximum height above the floor surface shall not exceed sixty (60) inches.**
- (g) Clearance from wall surfaces or other obstructions shall be at six (6) inches. Devices located in non-removable enclosures shall have at least twenty-four (24) inches of clearance on each side of the device for testing and repairs.**
- (h) Devices shall be positioned where a discharge from the relief port will not create undesirable conditions. The relief port must never be plugged, restricted or solidly piped to a drain.**
- (i) An approved air-gap shall separate the relief port from any drainage system. An approved air-gap shall be at least twice the inside diameter of the supply line, but never less than one (1) inch.**
- (j) Devices shall be located in an area free from submergence or flood potential, therefore never in a below grade pit or vault. All services shall be adequately supported to prevent sagging.**
- (k) Adequate drainage shall be provided for all devices, Reduced Pressure Backflow Prevention devices shall be drained to the outside whenever possible.**
- (l) Fire Hydrant drains shall not be connected to the sewer, nor shall fire hydrants be installed such that backflow/back-siphonage through the drain may occur.**

This is a portion of the cross connection policy. Any changes made to these criteria must be adopted and approved in your policy.

Installation Criteria for Enclosures

(A) Enclosures for outside installation shall meet the following criteria:

- 1. All enclosures for backflow prevention devices shall be as manufactured by a reputable company or an approval equal.**
- 2. For backflow prevention devices up to and including two (2) inches, the enclosure shall be constructed of adequate material to protect the device from vandalism and freezing and shall be approved by the Water Authority of Dickson County. The complete assembly, including valve stems and hand wheels, shall be protected by being inside the enclosure.**
- 3. To provide access for backflow prevention devices up to and including two (2) inches, the enclosure shall be completely removable. Access for backflow prevention devices 2-1/2" and larger shall be provided through a minimum of two access panels. The access panels shall be of the same height as the enclosure and shall be completely removable. All access panels shall be provided with built-in locks.**
- 4. The enclosure shall be mounted to a concrete pad in no case less than four (4) inches thick. The enclosure shall be constructed, assembled and/or mounted in such a manner that it will remain locked and secured to the pad even if any outside fasteners are removed. All hardware and fasteners shall be constructed of 300 series stainless steel.**
- 5. Heating equipment. If required, shall be designed and furnished by the manufacturer of the enclosure to maintain an interior temperature of + 40°F with an outside temperature of -30°F and a wind velocity of 15 miles per hour.**

This is a portion of the cross connection policy. Any changes made to these criteria must be adopted and approved in your policy.

Cross-Connection Control Program Audit Checklist For Sanitary Surveys

Backflow Prevention Assemblies Testing:

- ☐ All existing assemblies and air gaps must be tested or inspected within a 12 month period.
- ☐ All assemblies must have a status of Passed as determined from testing procedure. Air gaps must pass inspection.
- ☐ Assemblies that have a status of Failed or have not been tested within the 12 month period, will be given a strict compliance date (90 days maximum, 15 days maximum for High Risk High Hazard).

- ☐ Each tester must have a current and valid Certificate of Competency and test kit certification. See document entitled: *State Guidance for Certificate of Competency for Testing and Evaluating of Backflow Prevention Assemblies*.
- ☐ Copies of Certificate of Competency and test kit certifications must be on file for each tester.
- ☐ All test reports must be approved and properly recorded (all required sections completed).
- ☐ Testers must use DWS procedures for testing RP and DC. See document entitled: *State Guidance for Backflow Prevention Assembly Performance Evaluations*.

Enforcement:

- ☐ All premises with assemblies not tested or have a status of Failed in which the compliance date has passed are disconnected from the distribution system.
- ☐ All premises that have been documented and notified that protection is needed and the compliance date has passed have been disconnected from the distribution system.
- ☐ All enforcement issues have been resolved for premises that are not in compliance with the policy or ordinance (installation requirements, repairs, etc).

Records:

- ☐ Master List of all assemblies and air gaps used for premises isolation including location, assembly used, make, model, size, serial number etc.
- ☐ Test reports documenting assemblies have been tested annually and within the 12 month time period.
- ☐ Site inspection reports
- ☐ Copies of each tester's Certificate of Competency and test kit certification
- ☐ Annual public education documents and pamphlets

- ☐ Notifications to customers regarding compliance
- ☐ Approved Plan
- ☐ Approved Policy/Ordinance
- ☐ Residential Written Surveys

Public Education:

- ☐ Water System must provide public education about cross-connections and backflow prevention at least once annually to all customers. This may include bill inserts, public service announcements, pamphlet distribution, and consumer confidence report articles.

Surveys/Site Inspections:

Distribution system is broken down into two categories: **Residential** and **Non-Residential**

Inspections:

Nonresidential Inspections: Within a five year cycle all nonresidential establishments without backflow protection are inspected. The cycle is then repeated on the 6th year.

Residential Surveys: A goal of 20% of the residential customers is surveyed each year (for larger systems Statistical population will be proposed). The actual percentage will be agreed upon by the Division of Water Supply and Water System. The same customer may not be surveyed within a five year period. Inspections are performed on all establishments that meet criteria. The cycle is repeated on the 6th year.

Residential Surveys/Inspections:

- ☐ Written surveys are sent to residential customers.
- ☐ Written surveys are reviewed and sites that meet criteria for possible cross-connections are inspected.
- ☐ Results from all Inspections are recorded on an approved field sheet with a determination of the need for backflow prevention assembly.
- ☐ New residential customers are given questionnaires at service request along with information about cross-connection and backflow prevention. Results of the questionnaires are reviewed and sites that meet criteria are inspected.

- ❑ Secondary meters: If secondary meters are issued, these are inspected. If this is not done presently, start with all new meters, list all existing secondary meters, and draft a schedule of inspection for existing (approved by DWS).
- ❑ Well systems: Premises without backflow prevention assemblies that also have well systems must be inspected for cross-connections and a well user agreement signed. If this is not performed presently, start with all new wells drilled within the distribution area in the last year, list all existing well systems within the distribution system, and draft schedule for inspection (approved by DWS).

Non-Residential Surveys/Inspections

- ❑ All non-residential establishments are initially inspected or required to have an assembly. All non-residential establishments not requiring an assembly will be inspected at least annually. If this is not done presently, start with all new non-residential establishments, list all existing non-residential establishment, prioritize according to hazard, and draft schedule for inspection. These establishments are prioritized into High Risk Health Hazards, Health Hazards or Non-Health Hazard.
- ❑ Results from all Inspections are recorded on an approved field sheet with a determination of the need for backflow prevention assembly.

Sites Requiring Backflow Preventions Assemblies or Air Gaps:

- ❑ Sites that are deemed High Risk Health Hazard and Health Hazard by the water system must be protected by an approved RP, RP detector assembly, or an air gap (premises isolation only).
- ❑ Sites that are deemed Low Hazards may be protected by DC, RP, DC detector, RP detector, or air gap (premise isolation only).
- ❑ Only Class 1-3 Commercial fire prevention systems (non-chemical fire lines) may allow DC and DC detector assemblies. See document entitled: *State Guidance on Residential and Commercial Fire Sprinkler Systems*.
- ❑ Lawn Irrigation systems supplied by the water system must have an approved RP or RP detector assembly at minimum. See document entitled: *State Guidance on Lawn Irrigation Systems*.
- ❑ Residential Fire Systems: Flow-Through and Combination systems do not require the use of assemblies. Closed Residential Fire Systems require a DC at minimum.

Backflow Prevention Assembly Installation and Repair:

- ☐ All assemblies must be approved. See document entitled *State Guidance for Approved Backflow Prevention Assemblies*.
- ☐ Assemblies are installed in the approved orientation.
- ☐ Installation of assemblies should follow criteria set forth in State's Cross-Connection Control Manual and in plan.
- ☐ RP assemblies must never be placed in a pit, vault, or area subject to flooding.
- ☐ The RP's relief valve must have an approved air gap and can never be submerged or directly connected to a drainage system of any sort.
- ☐ The assembly must never be altered.
- ☐ After assembly is installed, it must pass the initial performance evaluation and be inspected for satisfaction of all installation criteria. The inspection is documented.
- ☐ Assemblies must be repaired according to manufacturer's procedures with approved parts.
- ☐ After repair, the assembly must be tested and have a status of Passed.