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**ARTICLE VII. - BACKFLOW PREVENTION DEVICES AND
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Sec. 16-351. - Purposes.

The purposes of this article are to:

- (1) Protect the public potable water supply of the city from the possibility of contamination or pollution by isolating within the customer's internal distribution system or the customer's private water system such contaminants or pollutants which could backflow into the public water system.
- (2) Protect the public water supply of the city from the possibility of contamination or pollution by isolation of the customer's distribution system, which includes provisions for backflow prevention devices located at the water meter.
- (3) Promote the elimination or control of existing cross connections, actual or potential, between the customer's in-plant potable water system and nonpotable water systems, plumbing fixtures and industrial piping systems.
- (4) Provide for the maintenance of a continuing program of cross connection control which will systematically and effectively prevent the contamination or pollution of the city water system.

(Ord. No. 1270, § 1(1), 1-21-85)

Sec. 16-352. - Definitions.

For the purpose of this article, the following words and terms shall have the meanings respectively ascribed:

Approved shall mean accepted by the director of public services as meeting an applicable specification stated or cited in this article, or as suitable for the proposed use.

Auxiliary water supply shall mean any water supply on or available to the premises other than the approved public water supply. These auxiliary waters may include water from another public potable water supply or any natural source such as a well, spring, river, stream, etc., or used waters or industrial fluids. Auxiliary waters may be contaminated, polluted or may be objectionable and constitute an unacceptable water source over which the water utility does not have sanitary control.

Backflow shall mean the reversal of the normal flow of water caused by either back-pressure or back-siphonage.

Backflow preventer shall mean a device or means designed to prevent backflow.

- (1) *Air-gap*. The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture or other device and the flood level rim of such vessel. An approved air-gap shall be at least double the diameter of the supply pipe, measured vertically, above the top of the overflow rim of the vessel; and in no case less than one inch.
- (2) *Reduced pressure principle device*. An assembly of two independently acting approved check valves together with a hydraulically operating, mechanically independent pressure relief valve located between the check valves and at the same time below the first check valve. The unit shall include properly located test cocks and tightly closing shutoff valves at each end of the assembly. The entire assembly shall meet the design and performance specifications as determined by a laboratory and field evaluation program resulting in an approval by a recognized and approved testing agency for backflow prevention assemblies as listed in this text. The assembly shall operate to maintain the pressure in the zone between the two check valves at an acceptance level less than the pressure on the public water supply side of the device. At cessation of normal flow, the pressure between the two check valves shall be less than the pressure on the public water supply side of the device. In case of leakage of either of the check valves the differential relief valve shall operate to maintain the reduced pressure in the zone between the check valves by discharging to the atmosphere. When the inlet pressure is two pounds per square inch or less, the relief valve shall open to the atmosphere. To be approved these devices must be readily accessible for in-line testing and maintenance and be installed in a location where no part of the device will be submerged.
- (3) *Double check valve assembly*. An assembly of two independently operating approved check valves with tightly closing shutoff valves on each end of the check valves, plus properly located test cocks for the testing of each check valve. The entire assembly shall meet the design and performance specification as determined by a laboratory and field evaluation program resulting in an approval by a recognized and approved testing agency for backflow prevention assemblies. To be approved these devices must be readily accessible for in-line testing and maintenance.

Back-pressure shall mean the flow of water or other liquids, mixtures or substances under pressure into the distribution pipes of a potable water supply system from any source other than the intended source.

Back-siphonage shall mean the flow of water or other liquids, mixtures or substances into the distribution pipes of a potable water supply system from any source other than its intended source caused by the sudden reduction of pressure in the potable water supply system.

Contamination shall mean an impairment of the quality of the potable water by sewage, industrial fluids or waste liquids, compounds or other materials to a degree which creates an actual or potential hazard to the public health through poisoning or through the spread of disease.

Cross connection, as based upon the U.S. Department of Health, Education and Welfare's Public Health Service Publication No. 525, shall mean any physical connection or arrangement of pipes between two otherwise separate water supply systems, one of which contains potable water and the other water of unknown or questionable safety, whereby water may flow from one system to the

other, the direction of flow depending on the pressure differential between the two systems.

Cross connection control by containment shall mean the installation of an approved backflow prevention device at the water service connection (meter) to any customer's premises which shall be required if determined necessary by the director of public services.

Cross connection, controlled. A connection between a potable water system and a nonpotable water system with an approved backflow prevention device properly installed and maintained so that it will continuously afford the protection commensurate with the degree of hazard.

Cross connection section shall mean any physical connection or arrangement of piping or fixtures between two otherwise separate piping systems, one of which contains potable water and the other nonpotable water or industrial fluids of questionable safety, through which, or because of which, backflow may occur into the potable water system. This would include any temporary connections, such as swing connections, removable sections, four-way plug valves, spools, dummy sections of pipe, swivel or change-over devices or sliding multiport tube.

Director of public services shall mean the individual in charge of the water utilities of the city, who is invested with the authority and responsibility for the implementation of an effective cross connection control program and for the enforcement of the provisions of this article.

Hazard, degree of, is a term which is derived from an evaluation of the potential risk to public health and the adverse effect of the hazard upon the potable water system.

- (1) *Hazard, health.* Any condition, device, or practice in the water supply system and its operation which would create, or in the judgement of the director of public services or director of the health and code enforcement division of the community development department, may create a danger to the health and well-being of the water consumer.
- (2) *Hazard, plumbing.* A plumbing type cross connection in a consumer's potable water system that has not been properly protected by an approved air-gap or approved backflow prevention device.
- (3) *Hazard, pollutional.* An actual or potential threat to the physical properties of the water system or to the potability of the public or the consumer's potable water system but which would constitute a nuisance or be aesthetically objectionable or could cause damage to the system or its appurtenances, but would not be dangerous to health.
- (4) *Hazard, system.* An actual or potential threat of severe damage to the physical properties of the public potable water system 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.

Industrial fluids system shall mean any system containing a fluid or solution which may be chemically, biologically or otherwise contaminated or polluted in a form or concentration such as would constitute a health, system, pollutional or plumbing hazard if introduced into an approved water supply. This may include, but not be limited to, polluted or contaminated waters; all types of process waters and used waters originating from the public potable water system which may have deteriorated in sanitary quality; chemicals in fluid form; plating acids and alkalis, circulating cooling waters connected to an open cooling tower and/or cooling towers that are chemically or biologically treated or stabilized with toxic substances; contaminated natural waters such as from wells, springs, streams, rivers, bays, harbors, seas, irrigation canals or systems, etc.; oils, gases, glycerine, paraffins, caustic and acid solutions and other liquid and gaseous fluids used in industrial or other purposes or for firefighting purposes.

Pollution shall mean the presence of any foreign substance (organic, inorganic or biological) in water which tends to degrade its quality so as to constitute a hazard to or impair the usefulness or quality of the water to a degree which does not create an actual hazard to the public health but which does adversely and unreasonably affect such waters of domestic use.

Water, nonpotable, shall mean water which is not safe for human consumption or which is of questionable potability.

Water, potable, shall mean any water which, according to recognized standards, is safe for human consumption.

Water service connection shall mean the terminal end of a service connection from the public potable water system; i.e., where the public services department loses jurisdiction and sanitary control over the water at its point of delivery to the customer's water system. If a meter is installed at the end of the service connection, then the service connection shall mean the downstream end of the meter. There should be no unprotected takeoffs from the service line ahead of any meter or backflow prevention device located at the point of delivery to the customer's water system. Service connection shall also include water service connection from a fire hydrant and all other temporary or emergency water service connections from the public potable water system.

Water, used, shall mean any water supplied by the public services department from a public potable water system to a consumer's water system after it has passed through the point of delivery and is no longer under the sanitary control of the public services department.

(Ord. No. 1270, § II, 1-21-85)

Cross reference— *Definitions and rules of construction*, § 1-2.

Sec. 16-353. - Responsibility for protection of potable water system; notice to install backflow prevention device.

The director of public services shall be responsible for the protection of the public potable water distribution system from contaminants or pollutants through the water service connection. If, in the judgement of the director of public services, an approved backflow prevention device is required (at the customer's water service connection or within the customer's private water system) for the safety of the water system, the director of public services shall give notice in writing to such customer to install such approved backflow prevention devices at specific locations on his premises. The customer shall immediately install such approved devices at his own expense; and failure, refusal or inability on the part of the customer to install, have tested and maintain such devices shall constitute a ground for discontinuing water service to the premises until such requirements have been satisfactorily met.

(Ord. No. 1270, § I(2), 1-21-85)

Sec. 16-354. - Water systems.

- (a) *Utility system*. The utility system shall consist of the source facilities and the distribution system, and shall include all those facilities of the water system under the complete control of the public service department, up to the point where the customer's system begins.
- (1) The source shall include all components of the facilities utilized in the production, treatment, storage and delivery of water to the distribution system.
 - (2) The distribution system shall include the network of conduits used for the delivery of water from the source to the customer's system.

- (b) *Customer's system.* The customer's system shall include those parts of the facilities beyond the termination of the utility distribution system which are utilized in conveying utility-delivered domestic water to points of use.

(Ord. No. 1270, § III(1), 1-21-85)

Sec. 16-355. - Policies, procedures and standards.

- (a) No water service connection to any premises shall be installed or maintained by the public services department unless the water supply is protected as required by state laws and regulation and this article. Service of water to any premises shall be discontinued by the public services department if a backflow prevention device required by this article is not installed, tested and maintained, or if it is found that a backflow prevention device has been removed, bypassed, or if an unprotected cross connection exists on the premises. Service will not be restored until such conditions or defects are corrected. If required, all businesses, commercial and industrial users shall provide, maintain and routinely test an approved backflow device. The director of public services, the director of the building inspection division of the community development department, or the director of the health and code enforcement division of the community development department may require such devices as deemed necessary. Residential dwellings with any design of lawn watering devices shall require a backflow device. The device shall be determined by the director of public services, the director of the building inspection division of the community development department or the director of the health and code enforcement division of the community development department. All irregular types of lawn watering devices shall require an approved backflow device.
- (b) The customer's system should be open for inspection at all reasonable times to authorized representatives of the public services department or the health and code enforcement division of the community development department to determine whether cross connections or other structural or sanitary hazards, including violations of these regulations, exist. When such a condition becomes known, the director of public services or the director of the health and code enforcement division of the community development department shall deny or immediately discontinue service to the premises by providing for a physical break in the service line until the customer has corrected the condition in conformance with state and city statutes relating to plumbing and water supplies and the regulations adopted pursuant thereto. Any cost of such disconnection and the estimated cost of reconnection must be paid by the customer before service shall be restored.
- (c) No cross connection shall be permitted between any system of piping supplied by water from the mains of the public services department and any other source of supply, either public or private; or any secondary supplies known to be unsafe for drinking water, such as shallow wells, reused industrial supplies, raw surface water or swimming pools.
- (d) Where city water is used as an auxiliary supply to a roof or suction tank, which is also supplied by water from any other source, such tank shall not be of the pressure type but open. The delivery of city water shall be above the tank overflow line and controlled by an approved automatic valve.
- (e) It shall be unlawful, also, to maintain storage tanks supplied only with city water, unless the tanks are satisfactorily built, and covered so as to prevent the entrance of contamination. They shall also be subject to periodic inspection by the public services department and maintained in a manner wholly satisfactory to the standards and requirements of the state department of health. Pumps taking suction from the city supply, serving such building storage shall be installed or operated only upon request and/or permit from the public services department subject to their approval as to size, rate, capacity and valving arrangements. Storage tanks supplied with city water shall require an approved backflow device. In such cases, a specific

backflow device shall be required at the service connection.

- (f) It shall be unlawful for anyone to interconnect private supplies, including deep well systems, with the city water system except as hereinafter provided:
- (1) Correction and maintenance, in a manner satisfactory to the state department of health and the public services department, of all existing sanitary defects in and around the private supply system.
 - (2) Provision to be made for complete bacteriological analysis by the American Public Health Association. This requirement means not less than four analyses each month of two standard samples, or more, if the analyses warrant.
 - (3) Approval from the city manager, the director of the building inspection division of the community development department, the director of public services and the director of the health and code enforcement division of the community development department.
 - (4) Provision by the owner of the private system involved to pay an equitable pro rata part of the cost of all inspections and testing herein required. The rates and method of paying for the same shall be determined by the public works department subject to the approval of the city manager.
- (g) If required, an approved backflow prevention device shall be installed on each service line to a customer'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 a premises having an auxiliary water supply which is not or may not be of safe bacteriological or chemical quality, the public water system shall be protected against backflow from the premises by installing an approved backflow prevention device in the service line appropriate to the degree of hazard.
 - (2) In the case of a premises on which any industrial fluids or any other objectionable substance is handled in such a fashion 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 device in the service line appropriate to the degree of hazard. This shall include the handling of process waters and waters originating from the utility system which have been subject to deterioration in quality.
 - (3) In the case of premises having internal cross-connections that cannot be permanently corrected and controlled, or 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 exist, the public water system shall be protected against backflow from the premises by installing an approved backflow prevention device in the service line.
 - (4) Any nonresidential building greater than one story elevation.
 - (5) Any residential building structure greater than two stories elevation.
- (h) All boilers shall require internal protection such as an approved air-gap separation or an approved reduced pressure principle device.
- (i) All bypass systems shall include a required backflow device as determined by the director of public service.
- (j) The type of protective device required shall depend upon the degree of hazard which exists as follows:
- (1) In the case of any premises where there is an auxiliary water supply, the public water system shall be protected by an approved air-gap separation or an approved reduced pressure air-gap separation or an approved reduced pressure principle backflow

prevention device.

- (2) In the case of any premises where there is water or substance that would be objectionable but not hazardous to health if introduced into the public water system, the public water system shall be protected by an approved double check valve assembly or an approved air-gap separation.
 - (3) In the case of any premises where there is any material dangerous to health which is handled in such a fashion as to create an actual or potential hazard to the public water system, the public water system shall be protected by an approved air-gap separation or an approved reduced pressure principle backflow prevention device. Examples of premises where these conditions will exist include sewage treatment plants, sewage pumping stations, chemical manufacturing plants, hospitals, mortuaries and plating plants.
 - (4) In the case of any premises where there are uncontrolled cross connections, either actual or potential, the public water system shall be protected by an approved air-gap separation or an approved reduced pressure principle backflow prevention device at the service connection.
 - (5) In the case of any premises where, because of security requirements or other prohibitions or restrictions, it is impossible or impractical to make a complete in-plant cross connection survey, the public water system shall be protected against backflow from the premises by either an approved air-gap separation or an approved reduced pressure principle backflow prevention device on each service to the premises.
 - (6) Any residential or commercial user shall provide backflow prevention on all irrigation systems. Atmospheric or pressure vacuum breakers may be utilized on irrigation systems subject to the degree of hazard and approval from the director of the building inspection division of the community development department, the director of the health and code enforcement division of the community development department and the director of public services.
- (k) Any backflow prevention device required herein shall be of a model and size approved by the director of the building inspection division of the community development department. The term "approved backflow prevention device" shall mean a device that has been manufactured in full conformance with the standards established by the American Water Works Association entitled:
- AWWA C506-78 Standards for Reduced Pressure Principle and Double Check Valve Backflow Prevention Devices**

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 established by:

Specifications of Backflow Prevention Devices #69-2, dated March 1969, or the most current issue.

Such AWWA and FCCC and HR standards and specifications have been adopted by the director of public services. Final approval shall be evidenced by a certificate of approval issued by an approved testing laboratory certifying full compliance with AWWA standards and FCCC and HR specifications. The following testing laboratories have been qualified by the director of public services to test and certify backflow preventers:

Foundation for Cross-Connection Control & Hydraulic Research
 University of Southern California
 University Park
 Los Angeles, CA 90007
 Texas A & M University

Extension Services
College Station, TX 77843-8000

Testing laboratories other than the laboratories listed above will be added to an approved list as they are qualified by the director of public services. Backflow preventers which may be subjected to back pressure or back siphonage that have been fully tested and have been granted a certificate of approval by such qualified laboratory and are listed on the laboratory's current list of approved backflow prevention devices may be used without further test or qualifications.

- (l) It shall be the duty of the user at any premises where backflow prevention devices are installed to have certified inspections and operational tests made at least once per year. In those instances where the director of public services deems the hazard to be great, he may require certified inspections at more frequent intervals. These inspections and tests shall be at the expense of the water user and shall be performed by the device manufacturer's representative, public services department personnel or by a certified tester approved by the director of public services. It shall be the duty of the director of public services to see that these tests are made in a timely manner. The user shall notify the director of public services in advance when the tests are to be undertaken so that he or his representative may witness the tests, if so desired. These devices shall be repaired, overhauled or replaced at the expense of the user whenever such devices are found to be defective. Records of such tests, repairs and overhauls shall be kept and made available to the director of public services. Records shall be kept for a period of not less than three years. If devices which service a particular line, including fire hydrants, etc., must require extended repair time, the owner shall notify the director of public services and the city fire department.
- (m) All fire lines shall utilize a double check-detector check, unless required otherwise by the director of public services.
- (n) All backflow/backsiphonage assemblies shall be installed in accordance with current public services department standards. Vaults, dimensions, etc., shall conform to local regulations.
- (o) All devices shall be inspected by the public services department upon completion of such project or development.
- (p) The director of public services shall administer an inspection program to assure that backflow prevention devices are properly maintained and operated. The director of public services, in administering the inspection program, shall take into account the complexity and operating characteristics of the devices and the protection afforded the potable water system by the devices. Reduced pressure and double check backflow prevention devices installed pursuant to the Uniform Plumbing Code (the city plumbing code) are subject to inspection and testing by the public services department.
- (q) Testers must successfully complete the state certification program directly related to backflow device certification. The approved tester must be registered by the public services department.
- (r) Should any system supplied by the city water be operated in violation of any provision of this article, it shall be the duty of the public services department to completely disconnect all service lines serving such system until this section is properly complied with. Any cost of such disconnection and the estimated cost of reconnection must be paid by the consumer before service shall be restored. If fire protection is being supplied by the noncompliant system, the public services department shall provide necessary manpower to reconnect the system in case of an emergency. However, the owner is responsible for proper protection and liability in association with all cross connection circumstances.
- (s) All backflow prevention devices installed as of January 1, 1985, which do not meet the requirements of this section but which were approved devices for the purposes described herein at the time of installation and which have been properly maintained shall, except for the inspection and maintenance requirements, be excluded from the requirements of these rules

so long as the director of public services is assured that they will satisfactorily protect the utility system. Whenever the existing device is moved from the present location, or requires more than minimum maintenance, or when the director of public services finds that the maintenance constitutes a hazard to health, the unit shall be replaced by an approved backflow prevention device meeting the requirements of this article.

- (t) Test cocks shall be required on all devices.
- (u) Identification, including the size, model number and serial number shall be placed on the actual unit at least one-fourth inch in height and of durable marking material.
- (v) A plumbing permit must be obtained for installation of all backflow installations.
- (w) All approved backflow devices should be of the type which is basically nonremovable and installed in such a manner that removal of the device would prohibit water flow.
- (x) If a cross connection situation arises, the director of public services may recommend to the director of the health and code enforcement division of the community development department and the city manager a boil water order. The order would provide some protection in a hazardous situation. The time for such order shall be determined by the director of public services based upon laboratory analysis.
- (y) All instances of cross connection cases shall be reported to the director of public services, the director of the health and code enforcement division of the community development department and the director of the building inspection division of the department of community development. The cases shall also be submitted to the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research as informational data only.
- (z) Internal protection surveys and system protection surveys shall be performed once each year per establishment or as determined by need or as determined by the director of public services.

Sec. 16-356. - Falsifying information.

Any person who knowingly makes any false statements, representation or certification in any application, record, report, plan or other document filed or required to be maintained pursuant to this article, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required under this article shall, upon conviction, be punished by a fine of not more than \$1,000.00 or by imprisonment for not more than six months, or by both.

(Ord. No. 1270, § V, 1-21-85)

Cross reference— General penalty for Code violations, § 1-15.

Sec. 16-357. - Violations, penalties.

- (a) Any person who shall violate any of the provisions of this article or who shall fail to comply with any provision hereof shall be guilty of a misdemeanor and, upon conviction, shall be subject to a fine not less than \$100.00 nor more than \$1,000.00, and each day that such violation continues shall constitute a separate offense and such violator shall be punished accordingly.
- (b) Any person violating any of the provisions of this article shall become liable to the city for any expense, loss or damage occasioned by the city by reason of such violation.
- (c) In addition to the penalties provided herein, the city may recover reasonable attorneys' fees, court costs, court reporters' fees and other expenses of litigation by appropriate suit at law against the person found to have violated this article or the orders, rules, regulations and permits issued hereunder.

(Ord. No. 1270, § IV, 1-21-85)

Cross reference— General penalty for Code violations, § 1-15.