

## **ORDINANCE NO. 3370**

### **AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF LUFKIN, TEXAS REQUIRING THE CONTROL OF BACKFLOW AND CROSS CONNECTIONS IN THE CITY'S WATER DISTRIBUTION SYSTEM IN ORDER TO PROTECT THE PUBLIC WATER SUPPLY, AS APPROVED BY THE CITY COUNCIL**

**WHEREAS**, the City of Lufkin, a home-rule municipality, is authorized by Charter to adopt and implement necessary and reasonable ordinances in the best interests of its citizenry; and

**WHEREAS**, health and safety issues associated with backflow and cross-connections in the public water supply are steadily increasing; and

**WHEREAS**, the City Council of the City of Lufkin, Texas recognizes the need to protect the public health from hazards resulting from backpressure or backsiphonage in the public water supply;

**NOW, THEREFORE, BE IT ORDAINED** by the City Council of the City of Lufkin, that the Code of Ordinances of the City of Lufkin be amended to include the following:

#### **SECTION 1 CROSS-CONNECTION CONTROL—GENERAL POLICY**

## 1.1 Purpose

The purpose of this ordinance is:

1.1 To protect the public potable water supply of the City of Lufkin from the possibility of contamination or pollution by isolating within the customer's internal distribution system(s) or the customer's private water system(s) such contaminants or pollutants that could backflow into the public water system;

1.1.2 To promote the elimination or control of existing cross connections, actual or potential, between the customer's in-plant potable water system(s) and nonpotable water systems, plumbing fixtures, and industrial piping systems;

1.1.3 To provide for the maintenance of a continuing program of cross-connection control that will systematically and effectively prevent the contamination or pollution of all potable water systems.

## 1.2 Responsibility

The City Engineer or his/her designee shall be responsible for the protection of the public potable water distribution system from contamination or pollution due to the backflow of contaminants or pollutants through the water service connection. If, in the judgment of said City Engineer or his/her designee an approved backflow-prevention assembly 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 City Engineer or his/her designated agent shall give notice in writing to said customer to install such an approved backflow-prevention assembly(s) at specific locations(s) on his/her premises. The customer shall immediately install such approved assembly(s) at his/her own expense; and, failure, refusal, or inability on the part of the customer to install, have tested, and maintain said assembly(s) shall constitute grounds for discontinuing water service to the premises until such requirements have been satisfactorily met.

## SECTION 2 DEFINITIONS

2.1 **Designee:** The Water Utilities Superintendent of the Public Works Division of the City of Lufkin, Texas is the designated official as assigned by the City Engineer who is vested with the authority and responsibility for the implementation of an effective cross-connection control program and for the enforcement of the provisions of this ordinance.

2.2 **Approved:** Approved by the authority responsible as meeting an applicable specification stated or cited in this ordinance or as suitable for the proposed use.

2.3 **Auxiliary Water Supply:** Any water supply on or available to the premises other than the purveyor's approved public water supply. These auxiliary waters may include water from another purveyor's public potable water supply or any natural source(s), such as a well, spring, river, stream, harbor, and so forth; used waters; or industrial fluids. These waters may be contaminated

or polluted, or they may be objectionable and constitute an unacceptable water source over which the water purveyor does not have sanitary control.

- 2.4 Backflow:** The undesirable reversal of flow in a potable water distribution system as a result of a cross connection.
- 2.5 Backpressure:** A pressure, higher than the supply pressure, caused by a pump, elevated tank, boiler, or any other means that may cause backflow.
- 2.6 Backsiphonage:** Backflow caused by negative or reduced pressure in the supply piping.
- 2.7 Backflow Preventer:** An assembly or means designed to prevent backflow.
- 2.7.1 Air gap:** The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet conveying water or waste to a tank, plumbing fixture, receptor, or other assembly and the flood level rim of the receptacle. These vertical, physical separations must be at least twice the diameter of the water supply outlet, never less than 1 in. (25 mm).
- 2.7.2 Reduced-pressure backflow-prevention assembly.** The approved reduced-pressure principle backflow-prevention assembly consists of two independently acting approved check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves and below the first check valve. These units are located between two tightly closing resilient-seated shutoff valves as an assembly and equipped with properly located resilient-seated test cocks.
- 2.7.3 Double check valve assembly.** The approved double check valve assembly consists of two internally loaded check valves, either spring loaded or internally weighted, installed as a unit between two tightly closing resilient-seated shutoff valves and fittings with properly located resilient-seated test cocks. This assembly shall only be used to protect against a nonhealth hazard (that is, a pollutant).
- 2.8 Contamination:** An impairment of a potable water supply by the introduction or admission of any foreign substance that degrades the quality and creates a health hazard.
- 2.9 Cross Connection:** A connection or potential connection between any part of a potable water system and any other environment containing other substances in a manner that, under any circumstances would allow such substances to enter the potable water system. Other substances may be gases, liquids, or solids, such as chemicals, waste products, steam, water from other sources (potable or nonpotable), or any matter that may change the color or add odor to the water.
- 2.10 Cross Connections-Controlled:** A connection between a potable water system and a nonpotable water system with an approved backflow-prevention assembly properly installed and maintained so that it will continuously afford the protection commensurate with the degree of hazard.
- 2.11 Cross-Connection Control by Containment:** The installation of an approved backflow-prevention assembly at the water service connection to any customer's premises, where it is

physically and economically unfeasible to find and permanently eliminate or control all actual or potential cross connections within the customer's water system; or is shall mean the installation of an approved backflow-prevention assembly on the service line leading to and supplying a portion of a customer's water system where there are actual or potential cross connections that cannot be effectively eliminated or controlled at the point of the cross connection.

**2.12 Hazard, Degree of:** The term is derived from an evaluation of the potential risk to public health and the adverse effect of the hazard upon the potable water system.

**2.12.1 Hazard-health:** A cross connection or potential cross connection involving any substance that could, if introduced in the potable water supply, cause death, illness, spread disease, or have a high probability of causing such effects.

**2.12.2 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 an approved backflow-prevention assembly.

**2.12.3 Hazard-nonhealth.** A cross connection or potential cross connection involving any substance that generally would not be a health hazard but would constitute a nuisance or be aesthetically objectionable, if introduced into the potable water supply.

**2.12.4 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 that would have a protracted effect on the quality of the potable water in the system.

**2.13 Industrial Fluids System:** Any system containing a fluid or solution that may be chemically, biologically, or otherwise contaminated or polluted in a form or concentration, such as would constitute a health, system, pollution, 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 that may have deteriorated in sanitary quality; chemicals in fluid form; plating acids and alkalies; 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 wells, springs, streams, rivers, bays, harbors, seas, irrigation canals or systems, and so forth; oils, gases, glycerine, paraffins, caustic and acid solutions, and other liquid and gaseous fluids used in industrial or other purposes for fire-fighting purposes.

**2.14 Pollution:** The presence of any foreign substance in water that tends to degrade its quality so as to constitute a nonhealth hazard or impair the usefulness of the water.

**2.15 Water-Potable:** Water that is safe for human consumption as described by the public health authority having jurisdiction.

**2.16 Water-Nonpotable:** Water that is not safe for human consumption or that is of questionable

quality.

**2.17 Service Connection:** The terminal end of a service connection from the public potable water system, that is, where the water purveyor 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 assembly 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.

**2.18 Water-Used:** Any water supplied by a water purveyor from a public potable water system to a consumer's water system after it has passed through the point of delivery and is no longer under the sanitary control of the water purveyor.

## SECTION 3 REQUIREMENTS

### 3.1 Water System

**3.1.1** *The water system shall be considered as made up of two parts: the utility system and the customer system.*

**3.1.2** 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 utility, up to the point where the customer's system begins.

**3.1.3** The source shall include all components of the facilities utilized in the production, treatment, storage, and delivery of water to the distribution system.

**3.1.4** The distribution system shall include the network of conduits used for the delivery of water from the source to the customer's system.

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

### 3.2 Policy

**3.2.1** No water service connection to any premises shall be installed or maintained by the water purveyor unless the water supply is protected as required by state/provincial laws and regulations and this ordinance. Service of water to any premises shall be discontinued by the water purveyor if a backflow-prevention assembly required by this ordinance is not installed, tested, and 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 will not be restored until such conditions or

defects are corrected.

**3.2.2** The customer's system should be open for inspection at all reasonable times to authorized representatives of the City of Lufkin to determine whether cross connections or other structural or sanitary hazards, including violations of these regulations, exist. When such a condition becomes known, the City Engineer or his designee 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(s) in conformance with state/provincial and city statutes relating to plumbing and water supplies and the regulations adopted pursuant thereto.

**3.2.3** An approved backflow-prevention assembly 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 wherever the following conditions exist:

**3.2.3a** In the case of premises having an auxiliary water supply that is not or may not be of safe bacteriological or chemical quality and that is not acceptable as an additional source by the City Engineer or his/her designee, the public water system shall be protected against backflow from the premises by installing an approved backflow-prevention assembly in the service line, appropriate to the degree of hazard.

**3.2.3b** In the case of premises on which any industrial fluids or any other objectionable substances are 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 assembly 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 that have been subject to deterioration in quality.

**3.2.3c** In the case of premises have (1) internal cross connections that cannot be permanently corrected and controlled, or (2) intricate plumbing and piping arrangements or where entry to all portions of the premises is not readily accessible for inspection purposes, making it impracticable or impossible to ascertain whether or not dangerous cross connections exist, the public water system shall be protected against backflow from the premises by installing an approved backflow-prevention assembly in the service line.

**3.2.4** The type of protective assembly required under subsections 3.2.3a, 3.2.3b, and 3.2.3c shall depend upon the degree of hazard that exists as follows:

**3.2.4a** In the case of any premises where there is an auxiliary water supply as stated in subsection 3.2.3a of this section and it is not subject to any of the following rules, the public water system shall be protected by an approved air-gap separation or an

approved reduced-pressure principle backflow-prevention assembly.

**3.2.4b** 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.

**3.2.4c** In the case of any premises where there is any material dangerous to health that 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 assembly. Examples of premises where these conditions will exist include sewage treatment plants, sewage pumping stations, chemical manufacturing plants, hospitals, mortuaries, and plating plants.

**3.2.4d** 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 assembly at the service connection.

**3.2.4e** 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 assembly on each service to the premises.

**3.2.4f** In the case of any premises where, in the opinion of the City Engineer or his/her designee, an undue health threat is posed because of the presence of extremely toxic substances, the City Engineer or his/her designee may require an air gap at the service connection to protect the public water system. This requirement will be at the discretion of the City Engineer or his/her designee and is dependent on the degree of hazard.

**3.2.5** Any backflow-prevention assembly required herein shall be a model and size approved by the City Engineer or his/her designee. The term *approved backflow-prevention assembly* shall mean an assembly that has been manufactured in full conformance with the standards established by the American Water Works Association titled:

AWWA C510-89-Standard for Double Check Valve Backflow-Prevention Assembly, and

AWWA C511-89-Standard for Reduced-Pressure Principle Backflow-Prevention Assembly,

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 “Specification of Backflow-Prevention Assemblies”-- Sec. 10 of the most current issue of the *Manual of Cross-Connection Control*. Said AWWA and FCCHR standards and specifications have been adopted by the City Engineer or his/her designee. Final approval shall be evidenced by a “Certificate of Approval” issued by an approved testing laboratory certifying full compliance with said AWWA standards and FCCHR specifications.

The following testing laboratory has been qualified by the City Engineer or his/her designee to test and certify backflow preventers:

Foundation for Cross-Connection Control and Hydraulic Research  
University of Southern California  
University Park  
Los Angeles, CA 90089

Testing laboratories, other than the laboratory listed above, will be added to an approved list as they are qualified by the (*water commissioner or health officer*).

Backflow preventers that may be subjected to backpressure or backsiphonage that have been fully tested and have been granted a certificate of approval by said qualified laboratory and are listed on the laboratory’s current list of approved backflow-prevention assemblies may be used without further testing or qualification.

**3.2.6** It shall be the duty of the customer-user at any premises where backflow-prevention assemblies are installed to have certified inspections and operational tests made at least once per year. In those instances where the City Engineer or his/her designee deems the hazard to be great enough, certified inspections may be required at more frequent intervals. These inspections and tests shall be at the expense of the water user and shall be performed by the assembly manufacturer’s representative, City Engineer or his/her designee personnel, or by a certified tester approved by the City Engineer or his/her designee. It shall be the duty of the City Engineer or his/her designee to see that these tests are made in a timely manner. The customer-user shall notify the City Engineer or his/her designee in advance when the tests are to be undertaken so that the customer-user may witness the tests if so desired. These assemblies shall be repaired, overhauled, or replaced at the expense of the customer-user whenever said assemblies are found to be defective. Records of such tests, repairs, and overhaul shall be kept and made available to the City Engineer or his/her designee.

**3.2.7** All presently installed backflow-prevention assemblies that do not meet the requirements of this section but were approved assemblies for the purpose described herein at the time of installation and that have been properly maintained, shall, except for the inspection and maintenance requirements under subsection 3.2.6, be excluded

from the requirements of these rules so long as the City Engineer or his/her designee is assured that they will satisfactorily protect the utility system. Whenever the existing assembly is moved from the present location, requires more than minimum maintenance, or when the City Engineer or his/her designee finds that the maintenance constitutes a hazard to health, the unit shall be replaced by an approved backflow-prevention assembly meeting the requirements of this section.

**3.2.8** This ordinance consist of the following exhibits: Table 1 (Guide to the Assessment of Hazard & Selection of Assemblies for Internal Protection), Table 2 (Guide to the Assessment of Hazard & Selection of Assemblies for Premises Isolation), Figures 1-6 (Class of Fire Protection Systems). These exhibits are provided as a guide for selection of type of backflow prevention device which may be required.

All ordinances or parts of ordinances in conflict herewith are hereby repealed.

This Ordinance shall be applicable after the 20<sup>th</sup> day of February, 1999.

PASSED AND APPROVED on First Reading by the City Council of the City of Lufkin, Texas, on this the 19<sup>th</sup> day of January, 1999.

Louis A. Bronaugh, Mayor

ATTEST:

Atha Martin, City Secretary

PASSED AND APPROVED on Second Reading by the City Council of the City of Lufkin, Texas, on this the 10<sup>th</sup> day of February, 1999.

Louis A. Bronaugh, Mayor

ATTEST:

Atha Martin, City Secretary

**Table 1-Guide to the Assessment of Hazard & Selection of Assemblies for Internal Protection**

Description of Cross Connection	Assessment of Hazard	Recommended Assembly at Fixture*
Aspirator (medical)	Health	AVB or PVB
Bedpan washers	Health	AVB or PVB
Autoclaves	Health	RPBA
Specimen tanks	Health	AVB or PVB
Sterilizers	Health	RPBA
Cuspidors	Health	AVB or PVB
Lab bench equipment	Health	AVB or PVB
Autopsy and mortuary equipment	Health	AVB or PVB
Sewage pump	Health	AG
Fire-fighting system (toxic liquid foam concentrates)	Health	RPBA
Connection to sewer pipe	Health	AG
Connection to plating tanks	Health	RPBA
Irrigation systems with chemical additives or agents	Health	RPBA
Connection to salt-water cooling system	Health	RPBA
Tank vats or other vessels containing toxic substances	Health	RPBA
Connection to industrial fluid systems	Health	AG
Dye vats or machines	Nonhealth†	RPBA
Cooling towers with chemical additives	Nonhealth†	RPBA
Trap primer	Nonhealth†	DCVA
Steam generators	Nonhealth†	DCVA, AVB, or PVB
Heating equipment	Nonhealth†	RPBA or AG
Commercial	Nonhealth†	PVB or AG
Domestic	Nonhealth†	RPBA or PVB
Irrigation systems	Nonhealth†	DCVA or AVB or PVB
Swimming polls	Nonhealth†	DCVA
Public	Nonhealth†	AVB or PVB
Private	Nonhealth†	AVB
Vending machines	Nonhealth†	AG
Ornamental fountains	Nonhealth†	AVB or PVB
Degreasing equipment	Nonhealth†	AVB
Lab bench equipment	Nonhealth†	AVB
Hose bibbs	Nonhealth†	AVB
Trap primers	Nonhealth†	AVB
Flexible shower heads	Nonhealth†	AVB
Steam tables	Nonhealth†	RPBA
Washing equipment		
Shampoo basins		
Kitchen equipment		
Aspirators		
Domestic space-heating boiler		

Note: AG = air gap; AVB = atmospheric vacuum breaker; DCVA = double check valve backflow-prevention assembly; PVB = pressure vacuum breaker; RPBA = reduced-pressure principle backflow-prevention assembly.

\*AVBs and PVBs may be used to isolate health hazards under certain conditions, that is, backsiphonage situations. Additional area or premises isolation may be required.

†Where a greater hazard exists (due to toxicity or other potential health impact) additional area protection with RPBA is required.

**Table 2-Guide to the Assessment of Hazard & Selection of Assemblies for Premises Isolation**

Description of Premises	Assessment of Hazard	Recommended Assembly on Water Service Pipe
Hospitals, mortuaries, clinics, laboratories	Health	RPBA
Plants using radioactive material	Health	RPBA
Petroleum processing or storage facilities	Health	RPBA
Premises where inspection is restricted	Health	RPBA
Sewage treatment plant	Health	RPBA
Sewage lift stations	Health	RPBA
Commercial laundry	Health	RPBA
Plating or chemical plants	Health	RPBA
Docks and dockside facilities	Health	RPBA
Food and beverage processing plants	Health	RPBA
Pleasure-boat marina	Nonhealth	DCVA
Tall buildings (protection against excessive head of water)	Nonhealth	RPBA
Steam plants	Health	RPBA
Reclaimed water systems	Health	RPBA

Note: AG=air gap; AVB=atmospheric vacuum breaker; DCVA=double check valve backflow-prevention assembly ; PVB=pressure vacuum breaker; RPBA=reduced-pressure principle backflow-prevention assembly.