

CROSS CONNECTION CONTROL PROGRAM



We are committed to providing a reliable quality domestic water supply to our customers.

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Cross Connection Control General Policy

1. Purpose

- A. To protect the public water supply served by Consolidated Rural Water District #1 (water district) from the possibility of contamination or pollution.
- B. To promote the elimination, containment, isolation, or control of existing cross-connections, actual or potential, between the public water supply system and non-potable water systems, plumbing fixtures, industrial process systems, or other systems, which introduce or may introduce contaminants into the public water system or the consumer's water system.
- C. To provide for the maintenance of a continuing program of cross-connection control which will effectively prevent the contamination or pollution of all potable water systems by cross-connection.

2. Authority

- A. The Federal Safe Drinking Water Act of 1974, and the statutes of the State of Kansas (Regulation K.A.R. 28-15-18h of the Ks. Dept. of Health & Environment), state that the water purveyor has the primary responsibility of preventing water from unapproved sources, or any other substances, from entering the public potable water system.
- B. The Adopted Rules and Regulations and this policy of Consolidated Rural Water District #1 of Leavenworth County, Kansas.

3. Responsibility

The water district shall be responsible for the protection of the public potable water distribution system from contamination or pollution due to the backflow or back-siphonage of contaminants or pollutants through the water service connection. If, in the judgment of the water district, an approved backflow device is required at the service connection to any customer's premises, the Board or their delegated agent, shall give notice in writing to said customer to install an approved backflow prevention device at each service connection to his premises. The customer shall, within 90 days install such approved device, or devices, at his/her own expense, and failure or refusal, or inability on the part of the customer to install said device or devices within ninety (90) days, shall constitute a ground for discontinuing water service to the premises until such device or devices have been properly installed.

4. Definitions

A. Approved

Accepted by the water district meeting an applicable specification stated or cited in this regulation, or as suitable for the proposed use.

B. Auxiliary Water Supply

Any water supply, on or available, to the premises other than the purveyors approved public potable water supply.

C. Backflow

The flow of water or other liquids, mixtures or substances, under positive or reduced pressure in the distribution pipes of a potable water supply from any source other than its intended source.

D. Backflow Preventer

A device or means designed to prevent backflow or back-siphonage, most commonly categorized as an air gap, reduced pressure principle device, double check valve assembly, pressure vacuum breaker, atmospheric vacuum breaker, hose bibb vacuum breaker, residential dual check, double check with intermediate atmospheric vent, and barometric loop.

a. AirGap

A physical separation, sufficient to prevent backflow between the free-flowing discharge end of the potable water system and any other system. Physically defined as a distance equal to twice the diameter of the supply side pipe diameter but never less than one (1) inch.

b. Atmospheric Vacuum Breaker

A device that prevents back-siphonage by creating an atmospheric vent when there is either negative pressure or sub-atmospheric pressure in a water system.

c. Barometric Loop

A fabricated piping arrangement rising at least thirty-five (35) feet at its topmost point above the highest fixture it supplies. It is utilized in water supply systems to protect against back-siphonage.

d. Double Check Valve Assembly

An assembly of two (2) independently operating spring-loaded check valves with tightly closing shut-off valves on each side of the check valves, plus properly located test cocks for the testing of each check valve.

e. Double Check Valve with Intermediate Atmospheric Vent

A device having two (2) spring-loaded check valves separated by an atmospheric vent chamber.

f. Hose Bibb Vacuum Breaker

A device that is permanently attached to a hose bibb and acts as an atmospheric vacuum breaker.

g. Pressure Vacuum Breaker

A device containing one or two independently operated spring-loaded check valves and an independently operated spring-loaded air inlet valve located on the discharge side of the check or checks. The device includes tightly closing shut-off valves on each side of the check valves and properly located test cocks for the testing of the check valve(s).

h. Reduced Pressure Principle Backflow Preventer

An assembly consisting of two (2) independently operating approved check valves with an automatically operating differential relief valve located between the two (2) check valves, tightly closing shut-off valves on each side of the check valves plus properly located test cocks for the testing of the check valves and the relief valve.

i. Residential Dual Check

An assembly of two (2) spring-loaded, independently operating check valves without tightly closing shut-off valves and test cocks. Generally employed immediately downstream of the water meter to act as a containment device.

E. Backpressure

A condition in which the owner's system pressure is greater than the supplier's system pressure.

F. Back-siphonage

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.

G. Commission

The Kansas Department of Health and Environment

H. Containment

A method of backflow prevention which requires a backflow preventer at the water service entrance.

I. Contaminant

A substance that will impair the quality of the water to a degree that it creates a serious health hazard to the public leading to poisoning or spread of disease.

J. Cross-Connection

Any actual or potential connection between the public water supply and a source of contamination or pollution.

K. Water District

Consolidated Rural Water District #1, Leavenworth County

L. Fixture Isolation

A method of backflow prevention in which a backflow preventer is located to correct a cross-connection at an in-plant location rather than at a water service entrance.

M. Owner

Any person who has legal title to, or license to operate or inhabit in, a property upon which a cross-connection inspection is to be made or upon which a cross-connection is present.

N. Person

Any individual, partnership, company, public or private corporation, political subdivision or agency of the State Department, agency or instrument, of the United States or any other legal entity.

O. Permit

A document issued by the Consolidated Rural Water District #1, Leavenworth County, Kansas, which allows the use of a backflow preventer.

P. Pollutant

A foreign substance, that if permitted to get into the public water system, will degrade its quality so as to constitute a moderate hazard, or impair the usefulness or quality of the

water to a degree that does not create an actual hazard to the public health but which does adversely and unreasonably affect such water for domestic use.

Q. Water Service Entrance

That point in the owner's water system beyond the sanitary control of the District; is generally considered to be the outlet end of the water meter and always before any unprotected branch.

R. Board of Directors and/or Manager

The Board of Directors or their delegated representative in charge of Consolidated Rural Water District #1, Leavenworth County is invested with the authority and responsibility for the implementation of a cross-connection control program and for the enforcement of the provisions of the Ordinance.

5. Administration

- A. The water department will operate a cross-connection control program, including the keeping of necessary records, which fulfills the requirements of the Kansas Department of Health and Environment's Cross-Connection Regulations and is approved by the Kansas Department of Health and Environment.
- B. The owner shall allow his property to be inspected for possible cross-connections and shall follow the provisions of the Consolidated Rural Water District #1, Leavenworth County's program, and the Kansas Department of Health and Environment's Regulations if a cross-connection is permitted.
- C. If the water department requires that the public supply be protected by containment, the Owner shall be responsible for water quality beyond the outlet end of the containment device and should utilize fixture outlet protection for that purpose. He may utilize public health officials, personnel from the water district, or their delegated representatives, to assist him in the survey of his facilities and assist him in the selection of proper fixture outlet devices, and the proper installation of these devices.

6. Requirements

A. Water District

- a. On new installations, the water district may provide on-site evaluation and/or inspection in order to determine the type of backflow preventer, if any, that will be required. In any case, a minimum of a dual check valve will be required in any new construction. Said preventer (if required) shall be tested immediately after being placed into service.
- b. For premises existing prior to the start of this program, the water district shall inform the owner by letter of any action and/or corrective action deemed necessary, the method of achieving the correction, and the time allowed for

the correction to be made. Ordinarily, ninety (90) days will be allowed, however, this time period may be shortened depending on the degree of hazard involved and the history of the device(s) in question.

- c. The water district will not allow any cross-connection to remain unless it is protected by an approved backflow preventer for which a permit has been issued and which will be regularly tested to insure satisfactory operation.
- d. The water district shall inform the Owner by letter, of any failure to comply. The water district will allow an additional fifteen (15) days for the correction. In the event the Owner fails to comply with the necessary correction by the time of the second notice, the water district will terminate service to the owner's premises. In the event that the Owner informs the water district of extenuating circumstances as to why the correction has not been made, a time extension may be granted by the water district but in no case will exceed an additional thirty (30) days.
- e. If the water district determines at any time that a serious threat to public health exists, the water service will be terminated immediately.
- f. The water district may have on file, a list of Private Contractors who are certified backflow device testers. All charges for these tests will be paid by the Owner of the building or property.
- g. The water district will begin initial premise inspections to determine the nature of existing or potential hazards, following the approval of this program by the Board of Directors. The initial focus will be on high-hazard industries and commercial premises.

B. Owner

- a. The Owner shall be responsible for the elimination or protection of all cross-connections on his premises.
- b. The Owner, after having been informed by a letter from the water district, shall at his expense, install, maintain, and have tested, any and all backflow preventers on his premises.
- c. The Owner shall correct any malfunction of the backflow preventer which is revealed by periodic testing and provide the water district with the corrected test results.
- d. The Owner shall inform the water district of any proposed or modified cross-connections and also any existing cross-connections of which the Owner is aware but has not been found by the water district.
- e. The Owner shall not install a bypass around any backflow preventer unless there is a backflow preventer of the same type on the bypass. Owners who

cannot shut down operations for testing of the device(s) must supply additional devices necessary to allow testing to take place.

- f. The Owner shall install backflow preventers in a manner approved by the water district under the National Plumbing Code, ASA A40.8-1955, or subsequent revisions thereof.
- g. The Owner shall install only backflow preventers approved by the water district or the Kansas Department of Health and Environment.
- h. Any Owner having a private well or another private water source, must have a permit if the well or source is cross-connected to the water district's system. Permission to cross-connect may be denied by the water district. The Owner may be required to install a backflow preventer at the service entrance if a private water source is maintained, even if it is not cross-connected to the water district's system.
- i. In the event the Owner installs plumbing to provide potable water for domestic purposes which is on the water district's side of the backflow preventer, such plumbing must have its own backflow preventer installed.
- j. The Owner shall be responsible for the payment of all fees for permits, device testing, and/or re-testing in the case that the device fails to operate correctly, and second re-inspections for non-compliance with the water district or Kansas Department of Health and Environment requirements. Devices will be tested at least once annually and more as deemed feasible based on the type of hazard.

7. Degree of Hazard

The water district recognizes the threat to the public water system arising from cross-connections. All threats will be classified by the degree of hazard and will require the installation of approved reduced pressure principle backflow prevention devices double-check valves.

8. Permits

The water district shall not permit a cross-connection within the public water supply system unless it is considered necessary and it cannot be eliminated.

- A. Cross-connection permits that are required for each backflow prevention device are obtained from the water district. A fee may be charged for the initial permit and for the renewal of each permit as deemed necessary by the Board of Directors. (See Rate Fee Schedule)
- B. Permits shall be renewed every year and are non-transferable. Permits are subject to revocation and become immediately revoked if the Owner should so change the type of cross-connection or degree of hazard associated with the service.

- C. A permit is not required when fixture isolation is achieved with the utilization of a non-testable backflow preventer.

9. Existing in-use backflow prevention devices.

Any existing backflow preventer shall be allowed by the water district to continue in service unless the degree of hazard is such as to supersede the effectiveness of the present backflow preventer, or result in an unreasonable risk to public health. Where the degree of hazard has increased, as in the case of a residential installation converting to a business establishment, any existing backflow preventer must be upgraded to a reduced pressure principle device, or a reduced pressure principle device must be installed in the event that no backflow device was present.

10. Periodic Testing

- A. All backflow devices shall be tested and inspected at least once annually.
- B. Periodic testing shall be performed by a certified tester. This testing will be done at the owner's expense.
- C. Any backflow preventer which fails during a periodic test must be repaired or replaced. When repairs are necessary, upon completion of the repair, the device must be re-tested at the Owners expense to insure correct operation. High-hazard situations will not be allowed to continue unprotected if the backflow preventer fails the test and cannot be repaired immediately. In other situations, a compliance date of not more than thirty (30) days after the test date will be established. The owner is responsible for spare parts, repair tools, or replacement devices. Parallel installation of two (2) devices is an effective means for the owner ensuring that uninterrupted water service during the testing or repair of devices and is strongly recommended when the owner desires such continuity.
- D. Backflow prevention devices will be tested more frequently than specified in "A" above, in cases where there is a history of test failures and the water district feels that due to the degree of hazard involved, additional testing is warranted. The cost of the additional test will be borne by the owner.

11. Records and Reports

A. Records

The water district will initiate and maintain the following:

- a. Master files on customers' cross-connection tests and/or inspections.
- b. Master files on cross-connection permits.
- c. Copies of permits and permit applications.
- d. Copies of lists and summaries supplied to KDHE.

A. Reports

The water district will submit the following to KDHE upon request:

- a. Initial listing of low-hazard cross-connections.
- b. Initial listing of high-hazard cross-connections.
- c. Annual update list of items 1 and 2 above.
- d. Annual summary of cross-connection inspections.

12. Addendum

A. Residential Dual Check

Effective the date of the acceptance of this Cross-Connection Control Program for Consolidated Rural Water District #1, Leavenworth County, Kansas, all new residential buildings will have installed a dual check device by means of the meter setter within the meter pit. Installation of this residential dual check device on a retrofit basis on existing service lines will be instituted at a time deemed feasible by the water department.

The owner must be aware that the installation of a residential dual check valve results in a potentially closed plumbing system within his residence. As such, provisions may have to be made by the owner to provide for thermal expansion within his closed loop system, the installation of thermal expansion devices, and/or pressure relief valves.

B. Strainers

The water district strongly recommends that all new retrofit installations of reduced pressure principle devices and double-check valve backflow preventers include the installation of strainers located immediately upstream of the backflow device. The installation of strainers will preclude the fouling of backflow devices due to both foreseen and unforeseen circumstances occurring to the water supply system such as water main repairs, water main breaks, fires, periodic cleaning and flushing of mains, etc. These occurrences may “stir up” debris within the water main that may cause fouling of backflow devices installed without the benefit of strainers.

13. Definitions of Cross-Connections

Hazards & Recommended Types of Backflow Prevention Devices

Hazard	Degree of Hazard		Recommended Type of Backflow Device				
	High	Low	AG	RPZ	PVB	AVB	DC
1. Direct Water Connections which may be subject to Backpressure:							
A. Pumps, tanks and lines handling:							
a. Sewage and lethal substances	X		X				
b. Toxic Substances	X		X	X			
c. Non-Toxic Substances		X	X	X			X
B. Water Connections to Steam & Steam Boilers							
a. Boilers 400K BTU/Hr. & Larger	X		X	X			
b. All boilers w/ Chemical Feeders	X		X	X			
c. Boilers smaller than 400K BTU/Hr w/out Chemical Feeders	X	X	X	X			X
Note: low hazard boilers must have blow-off properly air-gapped							
2. Direct or Indirect Water Connections Not Subject to Backpressure							
A. Sewer connected waste lines	X		X	X	X	X	
B. Low inlets to receptacles containing toxic substances*	X		X	X	X	X	
C. Low inlets to receptacles containing non-toxic substances**		X	X	X	X	X	X
D. Low inlets to domestic water tanks	Treat each case individually						
E. Lawn Irrigation Systems w/out chemical feeders		X	X	X	X	X	X
F. Lawn irrigation systems with chemical feeders	X		X	X	X	X	
G. Coils or jackets used as heat exchangers in compressors, degreasers or other equipment;							
a. In sewer lines	X		X	X			
b. In toxic substances*	X		X	X			
c. In non-toxic substances**		X	X	X			X
note: double wall heat exchangers w/ atmospheric vent may be used in lieu and must always be used when heating potable water.							
H. Flush valve toilets	X					X	
I. Toilet and Urinal Tanks	X					X	
J. Trough Urinals	X		X			X	
Note: AVB must be installed at least 30" above the flushing tube							
K. Valved outlets or fixture threaded to receive a hose	X		X	X	X	X	

*Toxic Substance: Any product that because of its nature would cause illness or death to any person or animal ingesting it.

**Non-toxic Substance: A product that if it entered a potable water supply would cause taste, odor or color, but not toxic.

High Hazard: If backflow occurred would cause serious degradation causing the supplying water to become a threat to health or life.

Low Hazard: If backflow occurred would cause the supplying water to become aesthetically degraded but not a threat to life or health.

14. Kansas Regulations

STATE OF KANSAS

REGULATIONS

BACKFLOW PREVENTION & CROSS-CONNECTION CONTROL

K.A.R. 28-15-18h

(KS Dept of Health & Environment)

(h) All community water systems and any high-risk non-community systems designated by the department shall have a regular program, approved by the department, for the detection and elimination of cross connection and prevention of backflow and back siphonage.

K.A.R. 49-50-4

(KS Dept. of Human Resources)

(a) A person shall not install any water-operated equipment or mechanism, or use any water-treating chemical or substance if it is found such equipment, mechanism, chemical or substance may cause pollution of the domestic water supply. The equipment or mechanism may be permitted only when equipped with an approved backflow prevention device.

(b) Each backflow prevention device installed in a potable water supply system shall be maintained in good working condition by the person or persons having control of the device. The devices may be inspected by authorized inspectors and, if found to be defective or inoperative, shall be repaired or replaced as directed by the inspector. Any device shall not be removed from use or relocated or another device substituted without formal notification to the office of the responsible authorized inspection agency.

(c) Potable water piping shall not be installed or maintained within any piping or device conveying sewage, wastes or other material hazardous to health and safety.

(d) Steam and steam boiler connections shall be protected by an approved backflow prevention device as set forth in subsection (e) of this section.

(e) Non-Potable water piping. If it is impractical to correct individual cross-connections on the domestic water line, the line supplying such outlets shall be considered a non-potable water line. Drinking or domestic water outlets shall not be connected to the non-potable water line. Backflow or back siphonage from the non-potable water line into the domestic water line shall be prevented by the installation of a gravity tank or by a tank having a pump designated for non-potable water. The domestic water inlets to the non-potable water tank shall have an approved air-gap as with the ASME code in effect on January 1, 1987. Where it is impractical to install such a tank, an approved pressure-type backflow or back-siphonage prevention device shall be installed as follows:

1. Where reverse flow is possible only as a result of a vacuum within the line, an approved pressure-type vacuum breaker unit or other approved backflow prevention device shall be installed in the supply line.
1. each pressure-type vacuum breaker unit shall be installed at a height of a least 12 inches (.3m) above the highest tank, equipment or other point at which the non-potable water is used. Other approved backflow prevention devices shall be installed in a manner satisfactory to the responsible authorized inspection agency, but in no case less than 12 inches (.3m) above the surrounding ground on floor.
2. Where backflow can occur (creating a higher pressure in the non-potable water line) an approved backflow prevention device shall be installed in the supply line. The backflow prevention device shall be installed at least 12 inches (.3M) above the surrounding ground or floor.

(f) Whenever possible, all portions of the non-potable water line shall be Exposed and all exposed portions shall be properly identified in a manner satisfactory to the responsible authorized inspection agency. Each outlet on the non-potable line which could be used for drinking or domestic purposes shall be posted with the following sign: **DANGER--- WATER UNSAFE.**

(g) An approved backflow prevention device shall conform to the requirements of the American Society of Sanitary Engineering Code as in effect on December 31, 1986.

K.S.A. 65-163 a

Cessation of water delivery to avoid contamination; order of cessation by the secretary; appeal.

- (a.) Any supplier of water may refuse to deliver water through pipes and mains to any premises where a condition exists which *might* lead to the contamination of the public water supply system and may continue to refuse the delivery of water to the premises until the condition is remedied.
- (b.) The secretary may order the supplier of water:
 1. to cease the delivery of water through pipes and mains to a premise or premises where a condition exists which *might* lead to the contamination of the public water supply system, or,
 2. to cease an activity that would result in a violation of the state's primary drinking water standards, or;
 3. to cease an activity that results in a continuing violation of the state's primary drinking water standards, or;
 4. to comply with any combination of these orders.

The supplier of water shall immediately comply with an order issued by the Secretary under this section.

© If a supplier of water considers the terms of such order to be illegal, unjust, or unreasonable, the operator may appeal within thirty (30) days after the issuance of the order to the district court of the county in which the public water supply system is located or, if the water supply system is located in more than one county, to the district court of any such county. The court shall hear the appeal without delay and shall approve, set aside or modify the order.

K.S.A. 65-171 g

Protection of water and air from sewage contamination. Water supply shall be protected against contamination from sewage by the prohibition of any connection between sewage and water systems that provide the possibility of water contamination by means of back siphonage or direct connection. Air in enclosed spaces shall be protected against contamination from toxic explosive or disagreeable gases or vapors from a sewage system by providing leak-tight and substantial waste and ventilation connections, and liquid-sealed traps on all plumbing fixtures discharging into any type of sewage disposal systems.

K.S.A. 65-171 I (j,k)

The following acts are prohibited:

(j) The application of fertilizers, pesticides or other chemicals by any person through any lawn irrigation system connected to a public water supply system except in areas where the public water supply system has adopted a program for the detection and elimination of cross-connections and preventions of backflow and back siphonage which has been approved by the secretary of health and environment, such application may be permitted by the public water supply system upon its periodic inspection and current approval of the installed air-gap or reduced pressure zone backflow prevention device which isolates the irrigation system.

(k) The use by any person of a public water supply system as a source of make-up for bulk chemical application tanks except that:

1. in areas where the public water supply system has adopted a program for the detection and elimination of cross-connections and prevention of backflow and back siphonage which has been approved by the secretary of health and environment, may be permitted by the public water supply system upon its periodic inspection and current of an air gap or reduced pressure zone backflow prevention device to protect the public water supply; and
2. in areas where the public water supply system has not adopted a program approved by the secretary of health and environment, such use may be permitted if an air gap or reduced pressure zone backflow prevention device is used and such device meets nationally recognized standards, as determined by the secretary of health and environment.

K.S.A. 65-171 y

- (a) subject to the provisions of subsection (b), any lawn irrigation system which is not used for the application of fertilizers, pesticides, or other chemicals shall not be deemed to be a high-hazard water system and shall not be required to be equipped with a high-hazard backflow prevention device. Any such lawn irrigation system installed, renovated, replaced, or extended on or after July 1, 1994, shall have at least a low-hazard double-check valve assembly as a minimum level of backflow prevention, and any such valve on a new system installed after July 1, 1994, shall be installed in such a manner as to be easily accessible for inspection.
- (b) a public water supply system operated by a city or county may impose any requirement, in addition to that provided by subsection (a), for backflow protection or prevention on lawn irrigation systems that are not used for the application of fertilizers, pesticides, or other chemicals and which are connected to the public water supply system.

CROSS CONNECTION CONTROL DEVICES

AIR GAP:

Gap must be two pipe diameters (in no case less than 1 inch)
Must be inspected annually
Satisfactory for any material
Whenever practical, the control method of choice.

REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER:

Contains two specifically designed, soft seated, independently acting check valves with a reduced pressure one (with relief valve) between the two checks.
Shut off valves before and after the device
Satisfactory for most toxic materials
Significant pressure loss (10 psi or more)
Must be tested and inspected annually. Repaired as necessary.

DOUBLE CHECK VALVE ASSEMBLY:

Contains two soft seated independently acting check valves series
Shut off valves before and after device
Adequate for non-toxic applications, only
Minor pressure loss
Must be inspected and tested annually. Repaired as necessary.

PRESSURE VACUUM BREAKER:

Must be installed a minimum of 12 inches above highest point of use.
No back pressure, only back siphonage
Can operate under constant pressure
Shut off valve can be located beyond the vacuum breaker
Must be inspected and tested annually. Repaired as necessary.

ATMOSPHERIC VACUUM BREAKER:

- Must be installed a minimum of 6 inches above highest point of usage
- No back pressure, only back siphonage
- Not for use under constant pressure.
- Shut off valve can be located ahead of the vacuum breaker
- Must be inspected annually and repaired as necessary.

Cross connection control devices must be inspected, tested and repaired by a trained technician. All devices should be installed such that they will be accessible for regular inspecting and testing.

All devices must be tested and/or certified by an authority acceptable to KDHE. These authorities include the American Society of Sanitary Engineers (ASSE), American Water Works Association (AWWA), Foundation for Cross Connection Control and Hydraulic Research, University of Southern California (FCCCHR of USC), Canadian Standards Association (CSA), Southern Building Code Congress (SBCC) or Factory Mutual (FM). Other testing or certifying authorities may be accepted by KDHE.