

**CROSS CONNECTION CONTROL**  
**AND**  
**BACKFLOW PREVENTION**  
**MANUAL**



**Patoka Lake Regional Water & Sewer District**

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## **Introduction**

### **What is a Cross Connection?**

For the use in this manual, a cross connection is defined as any physical arrangement whereby a public water supply is connected, directly or indirectly, with any secondary water supply system, sewer drain, conduit, pool, storage reservoir, plumbing fixture, or other device which contains or may contain any water, contaminated liquid, or other waste of unknown or unsafe quality that could impart a contaminant to the drinking water as a result of backflow or backsiphonage.

### **Protection of Water Supply System**

In order to protect the public water supply system from cross connections:

- No installation of public water supply piping or part thereof shall be made in such a manner that it will be possible for used, unclean, polluted, or contaminated water, mixtures, or substances to enter any portion of such piping from any tank, receptacle, equipment, or plumbing fixture by reason of backsiphonage, or any other cause, either during normal use and operation thereof or when any such tank, receptacle, equipment, or plumbing fixture is flooded, or subject to pressure in excess of the pressure in the hot or cold water piping.
- No person shall make a connection or allow one to exist between pipes or conduits carrying domestic water supplied by any public or private water service system, and any pipes, conduits or fixtures containing or carrying water from any other source or containing or carrying water which has been used for any purpose whatsoever, or any piping carrying chemicals, liquids, gases, or any substance, unless there is provided an approved backflow prevention device. The approval of the Indiana Department of Environmental Management must be obtained before any connection is made between the domestic supply and any contaminated, polluted, or auxiliary water system.
- No plumbing fixture, device, or construction shall be installed or maintained or shall be connected to any domestic water supply, when such installation or connection may provide a possibility of polluting such water supply or may provide a cross connection between a distributing system of water for drinking and domestic purposes and water which may become contaminated by such plumbing fixture devices or construction unless there is provided an approved backflow prevention device.

### **State of Indiana Cross Connection Regulations**

The following are sections from the Indiana Administrative Code (Regulations) which govern cross connections.

#### **170 IAC 6-1-20 WATER QUALITY STANDARDS**

Authority: IC 8-1-1-3; IC 8-1-1-12; IC 8-1-2-4

Affected: IC 8-1-2-33

Sec. 20. Quality. (A) Water furnished by any water utility for human Consumption or for domestic use shall be of such quality as will have the approval, or comply with the requirements, of the Indiana State Department of Health.

(B) (1) Public water supplies within the distribution pipe systems shall be adequately protected against pollution from back siphonage or cross connection with other systems on customer's property by proper installation of protective devices in accordance with the rules of the Indiana State Department of Health. Such protective devices shall be installed and maintained at the cost and expense of the customer, subject however, to the inspection test and approval of the utility before being placed in service, and at such times thereafter as recommended by the Indiana State Department of Health.

(2) Public water supplies shall also be adequately protected against any unnecessary and avoidable pollution at their own sources, and at all times after being taken therefrom, until delivery to the customer, to conform in all cases to the requirements of the Indiana State Department of Health. (Indiana Utility Regulatory Commission; No. 34805: Standards of Service For Water Utilities Rule 18; filed Nov 28, 1977, 3:00 pm: rules and Regs. 1978, p. 693)

## Rule 10. Cross Connections; Control; Operation

### 327 IAC 8-10-1 Definitions

Authority: IC 13-14-8; IC 13-14-9; IC 13-15-1-2; IC 13-15-2-1; IC 13-18-3-1;  
IC 13-18-4-1

Affected: IC 13-11-2; IC 13-13-5-1; IC 13-18-2

Sec. 1. In addition to the definitions contained in IC 13-11-2 and 327 IAC 1, the following definitions apply throughout this rule:

(1) "Air gap" means an unobstructed vertical distance through atmosphere between the discharge end of a pipeline supplied from a public water supply and the over flow rim of the receiving portion of the customer water system.

(2) "Backflow" means the flow of water or contaminants into the public water supply distribution system from a source other than the public water supply.

(3) "Booster pump" means a pump installed on a pipeline to increase water pressure or flow.

(4) "Commissioner" means the commissioner of the Indiana department of environmental management, or the commissioner's authorized representative.

(5) "Cross connection" means any physical arrangement, including cross connection control devices not in working order, whereby a public water supply distribution system is directly connected, either continuously or intermittently, with any secondary source of supply, sewer, drain, conduit, pool, piping, storage reservoir, plumbing fixture, or other device which contains, or may contain, and is capable of imparting to the public water supply, contaminants, contaminated water, sewage, or other waste or liquid of unknown or unsafe quality.

(6) "Cross connection control device" means any device or assembly, approved by the commissioner for construction on or installation in water supply piping, which is capable of preventing contaminants from entering the public water supply distribution system.

(7) "Cross connection control device inspector" means a person who has:

- (A) successfully completed training in testing and inspection of cross connection control devices from a training provider approved by the commissioner;
- (B) received a registration number from the commissioner; and
- (C) not been notified by the commissioner that the registration number has been revoked in accordance with section 11(b) of this rule.

(8) "Cross connection hazard" means any customer facility which, because of the nature an extent of activities on the premises or the materials used in connection with the activities or stored on the premises, would present an immediate or potential danger or health hazard to customers of the public water supply should backflow occur.

(9) "Customer" means any person who receives water from a public water supply.

(10) "Customer service line" means the pipeline from the public water supply to the:

- (A) first tap, fixture, receptacle, or other point of customer water use; or
- (B) secondary source of supply or pipeline branch in a building.

(11) "Customer water system" means all piping, fixtures, and appurtenances, including secondary sources of supply, used by a customer to convey water on his premises.

(12) "Double check valve assembly" means a device or assembly composed of two (2) tightly closing shut-off valves surrounding two (2) independently acting check valves, with four (4) test cocks, on (1) upstream of the four (4) valves and one (1) between each of the four (4) check and shut-off valves.

(13) "Downstream" means the direction of flow when only the public water supply is supplying water through the customer water system and backflow is not occurring.

(14) "Pressure vacuum breaker" means a device or assembly containing an independently operating internally loaded check valve and an independently operating loaded air inlet valve located on the downstream side of the check valve for relieving a vacuum or partial vacuum in a pipeline.

(15) "Public water system" means a public water supply for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen (15) service connections or regularly serves at least twenty-five (25) individuals daily at least sixty (60) days out of the year. The term includes any collection, treatment, storage, and distribution facilities under control of the operator of such system, and used primarily in connection with such system and any collection or

pretreatment storage facilities not under such control that are used primarily in connection with such system.

(16) "Reduced pressure principle backflow preventer" means a device composed of two (2) tightly closing shut-off valves surrounding two (2) independently acting pressure reducing check valves that, in turn, surround an automatic pressure differential relief valve, and four (4) test cocks, one (1) upstream of the five (5) valves and one (1) between each of the four (4) check and shut-off valves. The check valves effectively divide the structure into three (3) chambers; pressure is reduced in each downstream chamber allowing the pressure differential relief valve to vent the center chamber to atmosphere should either or both check valves malfunction.

(17) "Registration number" means a unique number assigned to a person by the commissioner demonstrating that the person has fulfilled the education and examination requirements as described in section 11 of this rule and is recognized by the state as a cross connection control device inspector.

(18) "Secondary source of supply" means any well, spring, cistern, lake, stream, or other water source, intake structure, pumps, piping, treatment units, tanks, and appurtenances used, either continuously or intermittently, to supply water other than from the public water supply to the customer, including tanks used to store water to be used only for firefighting, even though the water contained therein is supplied from the public water supply.

(19) "Supplier of water" means any person who owns or operates a public water supply.

(20) "Training provider" means an organization that conducts or presents a cross connection control device inspector course approved by the commissioner in conformance with section 12 of this rule.

(21) "Upstream" means the direction of flow opposite to downstream.

*(Water Pollution Control Board; 327 IAC 8-10-1; filed Sep 24, 1987, 3:00 p.m.: 11 IR 714; filed Mar 31, 1999, 1:50 p.m.: 22 IR 2515; errata filed Aug 30, 1999, 12:06 p.m.: 23 IR 25; filed Mar 6, 2000, 7:56 a.m.: 23 IR 1629)*

### **327 IAC 8-10-2 Cross connection prohibited; bypass**

Authority: IC 13-7-7-5; IC 13-7-14-5

Affected: IC 13-7-7-5; IC 13-7-14-5

Sec. 2. No customer shall cause or allow the construction or maintenance of a cross connection. Piping installed to bypass a cross connection control device constitutes a cross connection unless the bypass piping is also fitted with a similar cross connection control device. *(Water Pollution Control Board; 327 IAC 8-10-2; filed Sep 24, 1987, 3:00 p.m.: 11 IR 715)*

### **327 IAC 8-10-3 Booster pump connection**

Authority: IC 13-14-8; IC 13-14-9; IC 13-15-1-2; IC 13-15-2-1; IC 13-18-3-1;  
IC 13-18-4-1

Affected: IC 13-11-2; IC 13-13-5-1; IC 13-18-2

Sec. 3. No customer shall cause or allow the installation or maintenance of a booster pump in a public water system unless a device is installed to control operation of the booster pump when pressure to pump suction drops as follows:

(1) Whenever a fire suppression system has a booster pump installed only for fire suppression, it shall have an audible or visual alarm to provide warning when flow occurs and a control valve shall be installed on the booster pump discharge to automatically throttle the flow as necessary to maintain a minimum of ten (10) pounds per square inch, gauge, pump suction pressure.

(2) For all booster pumps other than those described in subdivision (1), a control device shall be installed to either prevent operation of the booster pump, or else to automatically throttle flow to or from the booster pump as necessary to maintain a minimum of twenty (20) pounds per square inch, gauge, pump suction pressure. The supplier of water may require that the control device be calibrated to maintain a higher than twenty (20) pounds per square inch, gauge, pump suction pressure, where necessary to provide a minimum pressure of twenty (20) pounds per square inch, gauge, throughout the pressure zone of the public water system distribution system to which the customer is connected.

*(Water Pollution Control Board; 327 IAC 8-10-3; filed Sep 24, 1987, 3:00 p.m.: 11 IR 715; filed Mar 31, 1999, 1:50 p.m.: 22 IR 2516)*

### 327 IAC 8-10-4 Cross connection hazards; notice; exemptions

Authority: IC 13-14-8; IC 13-14-9; IC 13-15-1-2; IC 13-15-2-1; IC 13-18-3-1;  
IC 13-18-4-1

Affected: IC 13-11-2; IC 13-13-5-1; IC 13-18-2

Sec.4. (a) Wherever a cross connection hazard as specified by subsection (c) is designated:

(1) an air gap shall be constructed or a reduced pressure principle backflow preventer shall be installed, in accordance with section 7 of this rule, on the customer service line for:

- (A) any new facility;
- (B) any modified customer service line; or
- (C) any existing facility where a higher capacity meter is installed; and

(2) neither an air gap nor a reduced pressure principle backflow preventer shall be required to be incorporated into customer service lines that both are utilized solely for fire suppression and are fitted with an audible alarm that will activate when water is detected to be flowing in the customer service line.

(b) Customers who have a cross connection that has resulted in a contaminant being introduced into a public water system or a customer water system:

(1) shall immediately construct an air gap or install a reduced pressure principle backflow preventer on the customer service line in accordance with section 7 of this rule; or

(2) is exempt from the requirements of subdivision (1) because the affected customer service line is both utilized solely for fire suppression and is fitted with an audible alarm that will activate when water is detected to be flowing in the line.

(c) The following customer facilities are designated cross connection hazards:

- (1) Aircraft and missile manufacturing plants.
- (2) Automotive plants, including those plants that manufacture motorcycles, automobiles, trucks, recreational vehicles, and construction and agricultural equipment.
- (3) Beverage bottling plants, including dairies and breweries.
- (4) Canneries, packing houses, and reduction plants.
- (5) Car washes.
- (6) Chemical, biological, and radiological laboratories, including those in high schools, trade schools, colleges, universities, and research institutions.
- (7) Hospitals, clinics, medical buildings, autopsy facilities, morgues, other medical facilities, and mortuaries.
- (8) Metal and plastic manufacturing, fabricating, cleaning, painting, and processing facilities.
- (9) Plants manufacturing paper and paper products.
- (10) Plants manufacturing, refining, compounding, or processing fertilizer, film, herbicides, natural or synthetic rubber, pesticides, petroleum or petroleum products, pharmaceuticals, radiological materials, or any chemical that could be a contaminant to the public water supply.
- (11) Commercial facilities that use herbicides, pesticides, fertilizers, or any chemical that could be a contaminant to the public water supply.
- (12) Plants processing, blending, or refining animal, vegetable, or mineral oils.
- (13) Commercial laundries and dye works, excluding coin-operated Laundromats.
- (14) Sewage, storm water, and industrial waste treatment plants and pumping stations.
- (15) Waterfront facilities, including piers, docks, marinas, and shipyards.
- (16) Industrial facilities that recycle water.
- (17) Restricted or classified facilities (federal government defense or military installations), or other facilities closed to the supplier of water or to the commissioner.

(d) Customer facilities not designated as a cross connection hazard by subsection (c) may be designated a cross connection hazard by written notification from the commissioner to the customer and to the customer's public water system. The notice shall specify the nature of the customer activity that necessitates designation of the customer's facility as a cross connection hazard, and the date by which the customer shall install a cross connection control device in accordance with section 7 of this rule, on the customer service line to the facility so designated.

(e) The commissioner may issue a letter exempting a customer from the requirements of subsection (a) if the customer can show to the satisfaction of the commissioner that the activities taking place at the customer's facility, and the materials used in connection with these activities or stored on the premises, cannot endanger the health of customers of the

public water system should backflow occur. An exemption shall remain valid for no more than three (3) years from the date of issuance. If the commissioner finds that the customer facility has become a cross connection hazard, the commissioner will void the exemption and so notify the customer. (*Water Pollution Control Board; 327 IAC 8-10-4; filed Sep 24, 1987, 3:00 p.m.: 11 IR 716; filed Mar 31, 1999, 1:50 p.m.: 22 IR 2516*)

### **327 IAC 8-10-5 Secondary sources of supply; installation of air gaps or other devices**

Authority: IC 13-14-8; IC 13-14-9; IC 13-15-1-2; IC 13-15-2-1; IC 13-18-3-1; IC 13-18-4-1  
Affected: IC 13-11-2; IC 13-13-5-1; IC 13-18-2

Sec.5. (a) Customers shall construct an air gap or install a reduced pressure principle backflow preventer or a double check valve assembly in accordance with section 7 of this rule, on the customer service line to:

(1) tanks used only to store water from the public water supply for fire suppression that are constructed to maintain the bacteriological quality of the water, in compliance with 327 IAC 8-2; or

(2) secondary sources of supply that:

(A) use well water as the only private source of supply;

(B) are constructed to maintain the bacteriological quality of the water, in compliance with 327 IAC 8-2; and

(C) produce, without treatment, water meeting the drinking water quality standards enumerated in 327 IAC 8-2.

(b) Customers shall construct an air gap or install a reduced pressure principle backflow preventer in accordance with section 7 of this rule on the customer service line to or into a facility having a secondary source of supply of a type other than those enumerated in subsection (a), that is used only for fire suppression.

(c) No secondary source of supply of a type other than those enumerated in subsections (a) and (b) shall be physically connected on the customer service line to or into the facility.

(*Water Pollution Control Board; 327 IAC 8-10-5; filed Sep 24, 1987, 3:00 p.m.: 11 IR 716; filed Mar 31, 1999, 1:50 p.m.: 22 IR 2517*)

### **327 IAC 8-10-6 Land irrigation facility buried below ground; installation of air gaps or other devices**

Authority: IC 13-14-8; IC 13-14-9; IC 13-15-1-2; IC 13-15-2-1; IC 13-18-3-1; IC 13-18-4-1  
Affected: IC 13-11-2; IC 13-13-5-1; IC 13-18-2

Sec.6. Customers shall construct an air gap, or install a reduced pressure principle backflow preventer or pressure type vacuum breaker in accordance with section 7 of this rule, on the water line connecting the public water supply to any land irrigation facility buried below ground that has a sprinkler outlet located less than six (6) inches above grade and is constructed after July 19, 1985. (*Water Pollution Control Board; 327 IAC 8-10-6; filed Sep 24, 1987, 3:00 p.m.: 11 IR 717; filed Mar 31, 1999, 1:50 p.m.: 22 IR 2518*)

### **327 IAC 8-10-7 Construction and installation requirements for air gaps or other devices**

Authority: IC 13-14-8; IC 13-14-9; IC 13-15-1-2; IC 13-15-2-1; IC 13-18-3-1; IC 13-18-4-1  
Affected: IC 13-11-2; IC 13-13-5-1; IC 13-18-2; IC 22-13-2

Sec.7. (a) The discharge pipe of an air gap shall terminate:

(1) a minimum of two (2) pipe diameters of the discharge pipe or six (6) inches, whichever is the lesser, above the maximum recorded flood level or above the flood level rim of the receiving vessel, whichever is higher; or

(2) a minimum of three (3) pipe diameters of the discharge pipe or six (6) inches, whichever is the lesser, above the maximum recorded flood level or above the flood level rim of the receiving vessel, whichever is higher where:

(A) a side wall, rib, or similar obstruction is spaced closer than three (3) diameters from the piping affecting the air gap; or

(B) two (2) intersecting walls are located closer than four (4) pipe diameters from the piping affecting the air gap.

(b) Only those models of double check valve assemblies, reduced pressure principle backflow preventers, and pressure vacuum breakers that have been listed by the Foundation for Cross Connection Control and Hydraulic Research of the University of Southern California, August, 27, 1997, or those acceptable under the Indiana plumbing code pursuant to the fire prevention and building safety commission rules at 675 IAC 16-1.2. {675 IAC 16-1.2 was repealed filed Jun 30, 1999, 2:53 p.m.: 22 IR 3414. See 675 IAC 16-1.3.}, shall be installed.

(c) Reduced pressure principle backflow preventers shall be installed horizontally with:

(1) no plug or additional piping affixed to the pressure differential relief valve port; and  
(2) the pressure differential relief valve port a minimum of twelve (12) inches above floor level. Additionally, the device must be installed at a location where any leakage from the pressure differential relief valve port will be noticed, and that allows access to the valve for maintenance and testing from floor level, without use of a ladder or other similar temporary apparatus, and that will not subject the device to flooding, excessive heat, or freezing.

(d) All double check valve assemblies shall be installed at a location that allows access to the device for maintenance and testing from floor level, without use of a ladder or other similar temporary apparatus, and that will not subject the device to flooding, excessive heat, or freezing.

(e) Pressure vacuum breakers shall be installed as near as possible to the irrigation facility, at a location that allows access to the device for maintenance and testing from floor or ground level, without use of a ladder or other similar temporary apparatus, and that will not subject the device to flooding, excessive heat, or freezing. Additionally, the device must be installed between two (2) tightly closing shut-off valves, with its center line or datum point a minimum of twelve (12) inches above:

(1) floor level;

(2) the highest downstream piping or shut-off valve; and

(3) the highest downstream overflow rim or discharge point.

*(Water Pollution Control Board; 327 IAC 8-10-7; filed Sep 24, 1987, 3:00 p.m.: 11 IR 717; filed Mar 31, 1999, 1:50 p.m.: 22 IR 2518)*

### **327 IAC 8-10-8 Inspection of devices; time limits**

Authority: IC 13-14-8; IC 13-14-9; IC 13-15-1-2; IC 13-15-2-1; IC 13-18-3-1; IC 13-18-4-1  
Affected: IC 13-11-2; IC 13-13-5-1; IC 13-18-2

Sec.8. (a) The customer shall install and maintain in working order at all times any cross connection control device or booster pump control device required by this rule.

(b) To ensure that each cross connection control device required by this rule is in working order, the customer shall have each device inspected or tested by a cross connection control device inspector at the time of construction or installation, and at the following intervals, in the following manner:

(1) Air gaps shall be inspected at intervals not exceeding one (1) year to ensure that they continue to meet the requirements of section 7 of this rule.

(2) Reduced pressure principle backflow preventers shall be tested at intervals not exceeding six (6) months to insure that:

(A) both check valves are drip-tight under all pressure differentials; and

(B) the pressure differential relief valve will maintain pressure in the center chamber at least two (2) pounds per square inch below that of the inlet chamber.

(3) Double check valve assemblies shall be tested at intervals not exceeding one (1) year to ensure that both check valves are drip tight under all pressure differentials.

(4) Pressure vacuum breakers shall be tested at intervals not exceeding one (1) year to ensure that the air inlet opens fully when water pressure is at or below atmospheric pressure.

(c) The customer shall permit access to the customer's premises by the inspector, the customer's public water system, or the commissioner, at reasonable times, and upon presentation of identification, for inspection of the customer water system or testing of cross connection control devices installed in accordance with this rule.

(d) Those customers granted an exemption in accordance with section 4(e) of this rule shall report to the commissioner and to the supplier of water any proposed change in process, plumbing, or materials used or stored at the exempted facility at least fourteen (14) days prior to making the change. Failure to do so shall void the exemption. *(Water Pollution Control Board; 327 IAC 8-10-8; filed Sep 24, 1987, 3:00 p.m.: 11 IR 717; filed Mar 31, 1999, 1:50 p.m.: 22 IR 2518; errata filed Aug 30, 1999, 12:06 p.m.: 23 IR 25)*

### **327 IAC 8-10-9 Inspectors; reports of inspection or test**

Authority: IC 13-14-8; IC 13-14-9; IC 13-15-1-2; IC 13-15-2-1; IC 13-16-1; IC 13-18-3-1; IC 13-18-4-1

Affected: IC 13-11-2; IC 13-13-5-1; IC 13-18-2

Sec.9. (a) All cross connection control device inspectors shall:

(1) be registered with the commissioner in accordance with section 11 of this rule; and

(2) submit reports of all inspections as required by subsection (b).

(b) The inspector shall report to the public water system, the customer and, if requested, the commissioner, on a form provided by the commissioner, the results of inspections or tests conducted pursuant to section 8(b) of this rule on air gaps, reduced pressure principle back-flow preventers, double check valve assemblies, and pressure vacuum breakers. Reports shall be submitted to the public water system and to the customer within thirty (30) days of the inspection or test. (*Water Pollution Control Board; 327 IAC 8-10-9; filed Sep 24, 1987, 3:00 p.m.: 11 IR 718; filed Mar 31, 1999, 1:50 p.m.: 22 IR 2519; errata filed Aug 30, 1999, 12:06 p.m.: 23 IR 25*)

### **327 IAC 8-10-10 Noncompliance; retention of reports; access**

Authority: IC 13-14-8; IC 13-14-9; IC 13-15-1-2; IC 13-15-2-1; IC 13-18-3-1; IC 13-18-4-1

Affected: IC 13-11-2; IC 13-13-5-1; IC 13-18-2

Sec.10. (a) Because cross connections may cause disease through transmission of contaminants via the public water system, the commissioner shall order the public water system to remove the customer service meter or otherwise sever the public water system connection to any customer which the commissioner finds or has reason to believe is in violation of any provision of this rule.

(b) The supplier of water shall retain the three (3) most recent reports of tests conducted on air gaps, reduced pressure principle backflow preventers, double check valve assemblies, and pressure vacuum breakers installed in accordance with this rule. The supplier of water shall permit access to these files at reasonable times and upon presentation of identification by the commissioner.

(c) If so requested, the public water system shall submit to the commissioner copies of any report required to be retained by subsection (b). (*Water Pollution Control Board; 327 IAC 8-10-10; filed Sep 24, 1987, 3:00p.m.: 11 IR 718; filed Mar 31, 1999, 1:50 p.m.: 22 IR 2519*)

### **327 IAC 8-10-11 Registration of inspectors; list of registered inspectors; list of approved devices**

Authority: IC 13-14-8; IC 13-14-9; IC 13-15-1-2; IC 13-15-2-1; IC 13-18-3-1; IC 13-18-4-1

Affected: IC 4-21.5; IC 13-11-2; IC 13-13-5-1; IC 13-18-2; IC 13-18-11-8

Sec.11. (a) Upon reviewing and finding the information certified by the training provider acceptable, the commissioner shall issue a registration number to each person whose training provider has certified that the applicant has met the following requirements of education and examination:

(1) The information supplied by the applicant must be reviewed and acceptable to the training provider.

(2) Each applicant must attend forty (40) hours of education and successfully complete a written and oral examination for cross connection device inspectors administered by a training provider.

(b) The commissioner may revoke the registration of any cross connection control inspector, following a hearing pursuant to IC 4-21.5, when it is found that the inspector has violated any of the provisions set out in this rule or IC 13-18-11-8.

(c) The commissioner shall maintain a list entitled "Indiana Registered Cross Connection Control Device Inspectors, All Inspectors", that is comprised of cross connection control device inspectors registered in Indiana.

(d) The commissioner shall maintain a list entitled "Indiana Registered Cross Connection Control Device Inspectors, Active Inspectors", that is comprised of cross connection control device inspectors that are registered in Indiana in accordance with subsection (a) and who have requested their inclusion on this list in writing to the commissioner during the previous two (2) years.

(e) The commissioner shall maintain a list entitled "List of Approved Backflow Prevention

Assemblies, August 27, 1997, Foundation for Cross Connection Control and Hydraulic Research, University of Southern California” that is comprised of a listing of cross connection control devices from the Foundation for Cross Connection Control and Hydraulic Research of the University of Southern California.

(f) The commissioner shall make the following lists as described in this section available to the public upon request:

- (1) Indiana Registered Cross Connection Control Device Inspectors, All Inspectors.
- (2) Indiana Registered Cross Connection Control Device Inspectors, Active Inspectors.
- (3) List of Approved Backflow Prevention Assemblies, August 27, 1997, Foundation for Cross Connection Control and Hydraulic Research, University of Southern California.

*(Water Pollution Control Board; 327 IAC 8-10-11; filed Sep 24, 1987, 3:00 p.m.: 11 IR 718; filed Mar 31, 1999, 1:50 p.m.: 22 IR 2519)*

### **327 IAC 8-10-12 Approval of an organization as a training provider of cross connection control device inspectors; record keeping**

Authority: IC 13-13-5-1; IC 13-14-8; IC 13-14-9; IC 13-15-1-2; IC 13-15-2-1; IC 13-18-2; IC 13-18-3-1; IC13-18-4-1

Affected: IC 4-21.5; IC 13-11-2; IC 13-18-11-8

Sec.12. (a) The commissioner shall approve an organization as a training provider of cross connection control device inspectors if the training provider’s proposed course meets the following requirements:

(1) The proposed course instruction and examination have a total duration of at least forty (40) hours.

(2) The proposed course deals with matters directly related to the cross connection control devices that include, but are not limited to, the following:

- (A) Cross connection identification, degree of hazard, prevention, control devices, and practices.
- (B) Backflow prevention assembly field test procedures and gage accuracy verification, Section 9 from the “Manual of Cross Connection Control”, ninth edition, 1993, from the Foundation for Cross Connection Control and Hydraulic Research, University of Southern California.
- (C) Cross connection control device inspection, repair, and maintenance.
- (D) Content, intent, and related policy of this rule.
- (E) Responsibilities of the customer, public water system, and cross connection control device inspector.

(3) Each instructor of the proposed course must be recognized by Indiana as a cross connection control device inspector and is qualified by academic work or practical experience directly related to cross connection control device inspection to teach the assigned subject.

(4) Includes both a written and oral examinations proctored by different instructors and meets the following requirements:

- (A) A written examination, which tests the student’s comprehension of the material discussed in subdivision (2).
- (B) An oral examination which tests the student’s ability and competency to perform inspections, test procedures specified under subdivision (2)(B), and troubleshooting on cross connection control devices.

(5) The organization submits a written request to the commissioner for approval as a training provider of cross connection control device inspectors. The request shall contain the following:

- (A) The name, address, and telephone number of the organization, name of the course, specific topics on which there are to be presentations, time devoted to each topic, and dates and locations where the course will be offered.
- (B) All instructor’s names, registration numbers, educational backgrounds, professional experiences, and current professional affiliations.
- (C) Information to demonstrate fulfillment of the requirements of subdivision (2) to the satisfaction of the commissioner.
- (D) A written class outline.

(b) The commissioner’s approval of an organization as a training provider of cross connection control device inspectors shall be valid for a duration of five (5) years.

(c) All training providers must maintain records on the date of all courses, the names of all individuals attending the course, duration of the course, all instructor’s names, and the program content. These records shall be maintained for five (5) years.

(d) Training providers must submit to the commissioner a record of individuals attending courses within thirty (30) days of the conclusion of the course. These records shall be maintained for a

five (5) year period. The record shall contain the following:

- (1) Name of course.
- (2) Name, address, and current phone number of individual attending course.
- (3) Date of course.
- (4) Performance on the written and oral examinations required by subsection (a)(4).

(e) The commissioner may revoke the approval of a training provider, following a hearing pursuant to IC 4-21.5, when it is found that the training provider has violated any of the provisions set out in the approval of the training provider's cross connection control device inspectors course, in this rule, or IC 13-18-11-8. (*Water Pollution Control Board; 327 IAC 8-10-12; filed Mar 31, 1999, 1:50 p.m.: 22 IR 2520; errata filed Aug 30, 1999, 12:06 p.m.: 23 IR 25*)

### **327 IAC 8-10-13 Incorporation by reference**

Authority: IC 13-14-8; IC 13-14-9; IC 13-15-1-2; IC 13-15-2-1; IC 13-18-3-1; IC 13-18-4-1

Affected: IC 13-11-2; IC 13-13-5-1; IC 13-18-2

Sec.13. (a) The following materials, including titles and names and addresses of where they may be located for inspection and copying, are incorporated by reference into this rule:

(1) "List of Approved Backflow Prevention Assemblies, August 27, 1997, Foundation for Cross Connection Control and Hydraulic Research, University of Southern California", Foundation for Cross Connection Control and Hydraulic Research, University of Southern California, Kaprielian Hall 200, Los Angeles, California 90089-2531 or from the Indiana Department of Environmental Management, Office of Water Management, Indiana Government Center-North, 100 North Senate Avenue, Room 1255, Indianapolis, Indiana 46206.

(2) Backflow Prevention Assembly Field Test Procedures and Gage Accuracy Verification, Section 9 from the "Manual of Cross Connection Control", ninth edition, 1993, Foundation for Cross Connection Control and Hydraulic Research, University of Southern California, Kaprielian Hall 200, Los Angeles, California 90089-2531 or from the Indiana Department of Environmental Management, Office of Water Management, Indiana Government Center-North, 100 North Senate Avenue, Room 1255, Indianapolis, Indiana 46206.

(b) The technical standards presented in subsection (a) are continuously revised on a twenty-four (24) month cycle. The commissioner shall commence rulemaking efforts to update the documents incorporated by reference in this section. (*Water Pollution Control Board; 327 IAC 8-10-13; filed Mar 31, 1999, 1:50 p.m.: 22 IR 2521*)

### **675 IAC 16-1.2-35.1 Section P-1505.12; connections to the potable water system**

Authority: IC 22-13-2-2

Affected: IC 22-13-2; IC 22-13-4; IC 36-7-2-9

Sec.35.1 Change subsection P-1505.12.3 to read as follows: P-1505.12.3 Connections to automatic fire sprinkler systems and standpipe systems: The potable water supply to automatic fire sprinkler and standpipe systems shall be protected against backflow by a double check valve assembly or a reduced pressure principle backflow preventer.

EXCEPTION: Where systems are installed as a portion of the water distribution system in accordance with the requirements of this code, and are not provided with a fire department connection, isolation of the water supply system shall not be required.

P-1505.12.3.1 Additives or non-potable source: Where systems contain chemical additives, antifreeze, or are connected to a non-potable secondary water supply, the potable water supply shall be protected against backflow by a reduced pressure principle backflow preventer. Where chemical additives or antifreeze are added to only a portion of an automatic fire sprinkler or standpipe system, the reduced pressure principle backflow preventer shall be permitted to be located so as to isolate that portion of the system.

(Fire Prevention and Building Safety Commission; 675 IAC 16-1.2-35.1; filed Dec 11, 1992, 5:00 p.m.: 16 IR 1389)

ORDINANCE FOR CROSS CONNECTION CONTROL  
ORDINANCE NO. 1991-2

TO PROVIDE A PROGRAM FOR PROTECTING THE PUBLIC WATER SYSTEM FROM CONTAMINATION DUE TO BACKFLOW OF CONTAMINANTS THROUGH THE WATER SERVICE CONNECTION INTO THE PUBLIC WATER SYSTEM

WHEREAS Chapter 10 of the Uniform Plumbing Code, as adopted by the State of Indiana, requires protection of the public water supply from contaminants due to backflow of contaminants through the water service connection; and

WHEREAS the Indiana Department of Environmental Management endorses the maintenance of a continuing program of cross connection control which will systematically and effectively prevent the contamination of all potable water systems;

NOW, THEREFORE, BE IT ORDAINED by the Board of Trustees of the Patoka Lake Regional Water and Sewer District, State of Indiana:

SECTION 1: That a cross connection shall be defined as any physical connection or arrangement between two otherwise separate systems, one of which contains potable water from the Patoka Lake Regional Water and Sewer District, and the other, water from a private water sources, water of unknown or questionable safety, or steam, gases, or chemicals, whereby there may be a flow from one system to the other, the direction of flow depending on the pressure differential between the two systems.

SECTION 2: That no person, firm, or corporation shall establish or permit to be established or maintain or permit to be maintained any cross connection. No interconnection shall be established whereby potable water from a private, auxiliary, or emergency water supply other than the regular public water supply of Patoka Lake Regional Water and Sewer District may enter the supply or distribution system of said municipality, unless such private, auxiliary, or emergency water supply and the method of connection and use of such supply shall have been approved by the Patoka Lake Regional Water and Sewer District and by the Indiana Department of Environmental Management in accordance with 327 IAC 8-10.

SECTION 3: That it shall be the duty of the Patoka Lake Regional Water and Sewer District to cause inspections to be made of all properties served by the public water system where cross connection with the public water system is deemed possible. The frequency of inspections and reinspections based on potential health hazards involved shall be as established by the Patoka Lake Regional Water and Sewer District.

SECTION 4: That upon presentation of credentials, the representative of the Patoka Lake Regional Water and Sewer District shall have the right to request at any reasonable time to examine any property served by a connection to the public water system of Patoka Lake Regional Water and Sewer District from cross

connections. On request, the owner, lessee, or occupant of any property so served shall furnish to the inspection agency any pertinent information regarding the piping system or systems on such property. The refusal of access or refusal of requested pertinent information shall be deemed evidence of the presence of cross connections.

SECTION 5: That the Patoka Lake Regional Water and Sewer District is hereby authorized and directed to discontinue water service to any property wherein any connection in violation of this ordinance exists, and to take such other precautionary measures deemed necessary to eliminate any danger of contamination of the public water system. Water service shall be discontinued only after reasonable notice is served on the owner, lessee, or occupants of the property or premises where a violation is found or suspected to exist. Water service to such property shall not be restored until the cross connection(s) has been eliminated in compliance with the provisions of this ordinance.

SECTION 6: That, if it is deemed by the Patoka Lake Regional Water and Sewer District that a cross connection or an emergency endangers public health, safety, or welfare and requires immediate action, and a written finding to that effect is filed with the Office of the Patoka Lake Regional Water and Sewer District and delivered to the consumer's premises, service may be immediately discontinued. The consumer shall have an opportunity for hearing within 10 days of such emergency discontinuance.

SECTION 7: That all customers using toxic or hazardous liquids, either as determined by the Patoka Lake Regional Water and Sewer District or those that fall in the following classifications:

1. FARMS:

A. Those that raise livestock and the possibility of cross connections may exist. Particularly those that raise poultry and pork, and use medicators hooked directly to water source. Also when found to be filling water troughs with a garden hose.

B. Those farms which produce crops, in which chemicals (i.e. pesticides, herbicides) are used and are often mixed with potable water via water hose.

2. FACTORIES:

A. Factories containing sprinkler systems and are connected directly to water source, whether an alarm warning system is used or not.

B. Factories with sprinkler systems that have an auxiliary water supply (i.e. holding tank, pond or other source requiring a pump).

3. Any type of thermal or solar unit whether it be residential, commercial, etc. that has an open loop

system and is connection directly to water source. Also any system of such where the potential for cross connection may exist and employ anti-freeze solutions or chemical corrosion inhibitors.

4. Wholesale meter pits at or near the meter where the point of sale exists and the water in that customers system is questionable in regards to its use, and is beyond the sellers control.

5. RV Resorts, Camping facilities or other recreational areas where more than one customer is provided with water for permanent or temporary use through one master meter.

6. Customers having an existing boiler or are planning on the future use of one where the potential for anti-freeze and/or corrosion inhibitors are present.

7. Customers having an existing air conditioning pump that have potable priming lines or that use recirculated water, or have plans for the above in the future.

8. All hospitals, mortuaries, wastewater treatment plants, and laboratories install and maintain a reduced-pressure-principle backflow preventer in the main water line serving each building on the premises. The backflow preventer must be installed in an easily accessible location not subject to flooding or freezing.

SECTION 8. That this ordinance does not supersede the State Uniform Plumbing Code but is supplementary to it.

SECTION 9. That this ordinance shall become effective upon its passage.

Adopted at Dubois, Indiana, on this 4th day of December, 1991.

  
Edwin H. Pieper, President

ATTEST:  
  
Mary Lou Schnell, Secretary

This ordinance prepared by:

Michael K. Phillips  
Phillips and Long, P.C.  
301 W. Main Street  
P.O. Box 525  
Boonville, IN 47601  
(812) 897-3500

## Additional and Expanded Definitions

**Air-gap separation** – means 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 the receptacle. An “approved air-gap separation” shall be at least double the inside diameter of the supply pipe or six (6) inch, whichever is the lesser a measured vertically above the top rim of the vessel; in no case shall the gap be less than one inch.

**Approved** – The term “approved” as herein used in reference to a water supply system or backflow prevention device (or method) shall mean one that has been approved by the appropriate regulatory agency.

**Auxiliary supply** – means any water source or system other than the public water supply that may be available in the building or premises.

**Backflow** – means the flow of any foreign liquids, gases, or substances into the distributing pipe lines of a potable supply of water. Backflow may occur under two conditions: pressure greater than atmospheric (see **Back Pressure**, below), and pressure that is sub-atmospheric (see **Backsiphonage**, below).

**Backflow prevention device, approved** – means a device that has been investigated and approved by the Indiana Department of Environmental Management and water purveyor having jurisdiction. (Approval of the device may be left to the water purveyor at the discretion of the regulatory agencies.)

**Backflow prevention device tester, certified** – means a person in good standing who is qualified to test backflow prevention devices and has proven his competency to the satisfaction of the appropriate regulatory agency.

**Back pressure** – means backflow caused by a pump, elevated tank, boiler, or other means that could create pressure within the system greater than the supply pressure.

**Backsiphonage** – means a form of backflow due to a negative or sub-atmospheric pressure within a water system.

**Consumer** – means the owner or operator of a private potable water system served by a public water supply.

**Contamination** – means an impairment of the quality of the public water supply by the presence of any foreign substance (organic, inorganic, radiological, or biological) to a degree, which creates a hazard to the public health through poisoning or through the spread of disease (see **Pollution**, below) or creates a nuisance condition such as discoloration, staining, tastes, or odors.

**Cross connection, point of** – means a specific point or location in a public or a consumer’s potable water system where a cross connection exists.

**Hazard, degree of** – expresses the results of an evaluation of a health, system, or plumbing hazard.

**Hazard, health** – means any condition, device, or practice in a water supply system and its operation that creates, or may create, a danger to the health and well-being of a consumer.

**Hazard, high (contamination)** – means a physical or toxic hazard, which could be detrimental to health.

**Hazard, low (pollution)** – means a hazard, which could cause aesthetic problems or have a detrimental effect on the quality of water in the system.

**Hazard, plumbing** – means a cross connection in a consumer’s potable water system that may permit backsiphonage in the event of a negative pressure in the supply line. (Unprotected plumbing-type cross connections are considered to be health hazards. They include, but are not limited to, faulty connections to fixtures such as toilets, sinks, tubs, lavatories, wash trays, and domestic washing machines.)

**Hazard, system** – means a threat to the physical quality of the public water or the consumer’s potable water system or introduction of a material not dangerous to health but aesthetically objectionable that would have a degrading effect on the quality of the potable water in the system.

**Industrial fluid** – means any fluid or solution that may chemically, biologically, or physically degrade the approved water supply.

**Industrial line** – means a separate water piping system serving water-using devices, with a backflow preventer or air gap separation on this line at the point of takeoff from the potable water line.

**Industrial piping system, consumers** – means a system used by a consumer for transmission or storage of anything (fluid, solid, or gas) other than the water supply intended or used for human consumption or food processing. (Such a system would include all pipes, conduits, tanks, receptacles, fixtures, equipment, and appurtenances used to produce, convey, or store substances that are or may be polluted.)

**Isolation** – means to install a backflow prevention device at the point of service connection on the downstream side of the water meter.

**Non-potable water** – means water not safe for drinking, personal, or culinary use.

**Operator** – means the person in direct or responsible charge and supervising the operation of a wastewater or water treatment plant and/or a water distribution system.

**Person** – means any person, firm, organization, partnership, trust, or association of persons, joint venture, corporation, or company, and includes the United States, the State of Indiana, and any officer or agent thereof.

**Points of delivery** – (See **Service connection**, below)

**Pollution** – means the presence in water of any foreign substance (organic, inorganic, radiologic, or biologic) that tends to degrade its quality so as to constitute a hazard or to impair its potability or usefulness.

**Potable water** – means water that is safe for drinking, personal, or culinary use.

**Premises** – means integrated land area including improvements thereon undivided by public thoroughfares or water distribution mains where all parts of the land area are operated under the same management and for the same purpose.

**Protection device** – means any of the following devices: 1) air gap separation; 2) approved double check valve assembly; 3) approved reduced-pressure-principle backflow prevention assembly, or 4) atmospheric or pressure vacuum breaker.

**Service connection** – means the terminal end of a service from the public water supply – that is, where the water purveyor surrenders jurisdiction and sanitary control over the water at its point of delivery to the consumer's water system. If a meter is installed at the end of the service connection, then the service connection means the downstream terminus of the meter.

**Water delivered (delivered water)** – shall mean any water supplied by a water purveyor from a public water supply to a consumer's water system after it has passed the point of delivery and is no longer under the sanitary control of the water purveyor.

**Water purveyor** – means the owner or operator of a public water supply.

**Water supply, approved** – means any public or consumer's potable water supply that has been investigated and approved by the Indiana Department of Environmental Management. In determining what constitutes an approved water supply, the Indiana Department of Environmental Management shall have the final judgment as to its safety and potability.

**Water system, consumers** – means any water system, potable or non-potable, located on the consumer's premises, whether supplied by a public water supply or an auxiliary water system.

## THE OWNER'S RESPONSIBILITY

“Contaminants added to the water by circumstances under the control of the consumer are not the responsibility of the supplier of water”. (PUBLIC WATER SUPPLY - FEDERAL REGISTER, Vol. 40, No. 248, page 11.)

In a court case, this could mean that the property owner is liable for any injury resulting from a backflow incident under his control. When it comes to responsibility, it could be very costly for any property owner controlling a Domestic Water System. This responsibility could even cover injuries and/or damages that occur outside of the property owner's building. Remember that contamination of the Public Water Supply caused by a backflow incident reverts to the source of the cross-connection.

## THERMAL EXPANSION

With the installation of a meter being set by Patoka Lake Regional Water & Sewer District, we must take this opportunity to inform you of a potential hazard that exists in relation to a dual check valve installed at your meter and your water heater.

Water heaters are installed with a temperature and pressure valve (T & P) which is designed to relieve excessive water temperature or pressure. Also aiding in the control of excessive heat and pressure is a condition known as thermal expansion, which allows extremely hot water to backflow into water main lines, mixing with the cold water and dissipating the heat.

However, when a backflow prevention device (dual check valve) is installed on a household water service line, the water cannot go back out into the water system. This leaves the T & P valve as the only release route for the overheated water.

If a water heater thermostat becomes defective, allowing the water temperature to increase to more than 212 degrees, and the T & P valve fails, your domestic water can become “superheated”. Superheated water can cause water heaters to explode and endanger lives and or property or could allow scalding steam to be released from facets upon personal use.

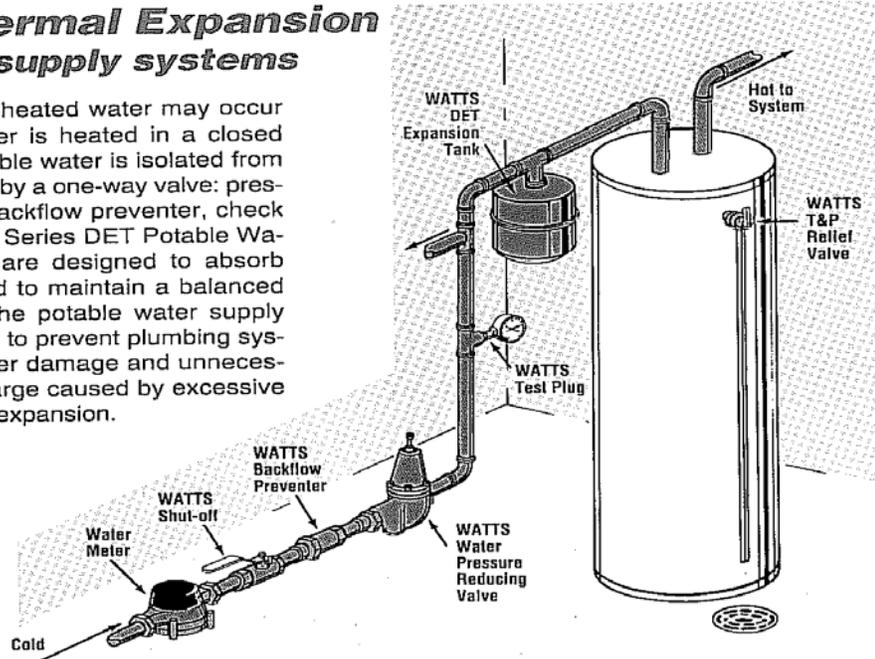
Patoka Lake Regional Water & Sewer District recommends that you inspect your T & P valve periodically. Also a licensed plumber can inspect, repair or replace your T & P valve to ensure your safety.

Thermal expansion chambers and pressure relief toilet ball cock assemblies can provide additional protections.

Should you have any questions or desire more information, please feel free to contact the Cross-Connection Department at 678-5781 or Toll Free 800-313-5589.

## Control Thermal Expansion in hot water supply systems

Thermal expansion of heated water may occur wherever potable water is heated in a closed system (when the potable water is isolated from the public water supply by a one-way valve: pressure reducing valve, backflow preventer, check valve, etc.). The Watts Series DET Potable Water Expansion Tanks are designed to absorb thermal expansion and to maintain a balanced pressure throughout the potable water supply system. They are used to prevent plumbing system and/or water heater damage and unnecessary relief valve discharge caused by excessive pressure from thermal expansion.



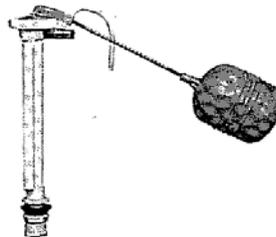
## Other Watts products for control of Thermal Expansion

### "Watts® Governor 80" Ball Cock and Relief Valve

A triple purpose product: toilet tank ball cock fill valve, anti-siphon backflow preventer and thermal expansion relief valve in one assembly. Listed by IAPMO and CSA certified for anti-siphon ball cocks, FDA approved under CFR-21-177-2600, ANSI/ASSE No. 1002. It will govern and limit the domestic water system preset static pressure to 80 psi, as required by plumbing codes. Eliminates the need for thermal expansion tanks, auxiliary relief valves and their discharge lines.

Max. operating temperature 110°F  
Standard heights are 10", 11½" or 12½"  
For additional information, send for F-80.

*The answer to thermal expansion problems*



### Water Pressure Test Gauge

Features:  
• Resettable high pressure indicator



No. 276H300

### No. 530

#### Calibrated Pressure Relief Valve

Calibrated adjustment feature for setting valve to relief pressure. Adjustable range 50-175 lbs.

- All brass construction and stainless steel spring
- Ideally suited as a by-pass thermal expansion relief valve

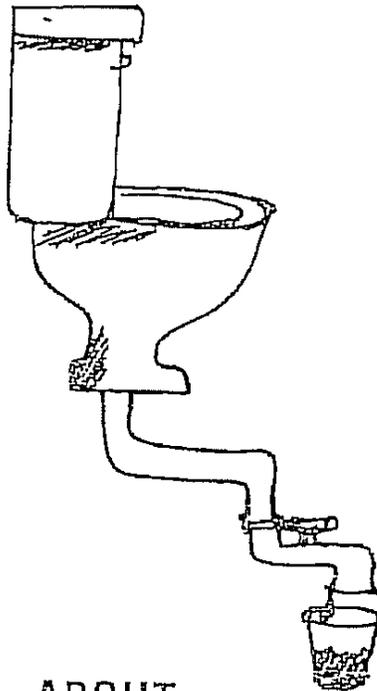
No.	Size	Height	Width	Weight
53	½", ¾"	2¾"	1¾"	½ lb.
530	½", ¾"	3"	1¾"	¾ lb.

For additional information, send for ES-530.



The Watts Expansion Team: A full range of solutions; DET Expansion Tank, Watts® Governor 80, 530 Pressure Relief Valve.

ARE  
YOU  
PARTICULAR...



ABOUT  
WHAT  
YOU  
DRINK?

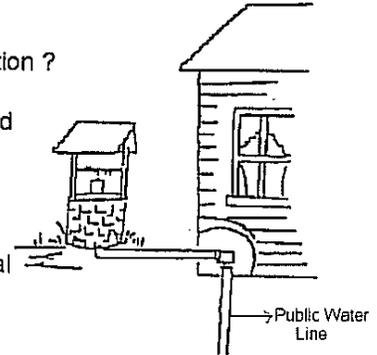
You can't see harmful substances in WATER...



You could unknowingly  
contaminate your community  
water supply !  
How ? through  
Back-siphonage or Cross  
Connection ...

What is A Cross Connection ?

Example: Maybe you had  
a well or cistern before a  
public water supply was  
brought into your  
neighborhood.  
Now you have city or rural  
water and you still have  
your well connected.



If there is a sudden loss of water in the main at the  
same time that you're using the well, your water could  
be forced back into the main.

The well connected to the same plumbing as your  
public water is creating a Cross Connection !

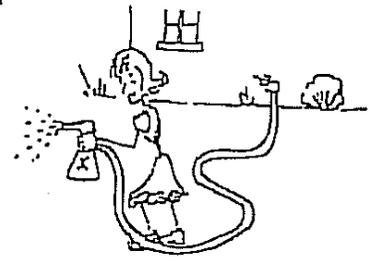
What is Back Siphonage?

Example: If someone  
withdraws gas from your  
car's tank, he has created a  
reversal of the normal flow,  
which causes a vacuum.



Now, what if you connect an insecticide spray gun to  
your garden hose ?

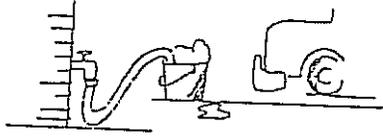
If a vacuum would occur  
in the waer main  
(created by a line break  
or sudden withdrawal  
due to a neighborhood  
fire,) your insecticide  
could be pulled back  
through your garden  
hose, through your  
plumbing, and out into  
the water system...



Poisoning your family and threatening other families !

... or Washing Your Car ?

The end of your garden hose in a bucket of detergent water is a Cross Connection and a potential hazard through Back-siphonage!

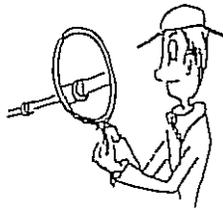


What Has Been Done To Protect You As A Water User ?

In July, 1985 the Indiana Environmental Management Board of the Indiana State Board of Health passed a

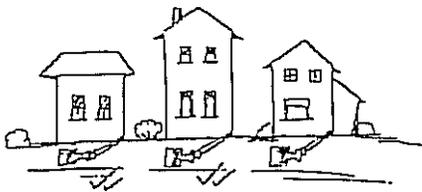
CROSS CONNECTION CONTROL RULE.

The Rule meant to keep your water safe from hazards originating from commercial or industrial establishments. This will be accomplished by inspection of any possible Cross Connection hazards - as well as inspection of new commercial or industrial construction!



What Can You Do To Protect Your Family and Neighbors ?

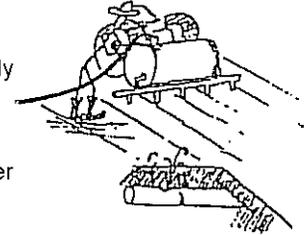
A properly operating Double Check Valve attached to your water meter can prevent any possibility of Back-pressure from your plumbing contaminating your household or neighbors on down the line !



The Indiana State Board of Health has recommended that Double Check Valves be installed at every service - even though it is not currently required by the Cross Connection Rule. You may help by supporting your utility in establishing a Policy of installing Double Check Valves !

Herbicidal Homicide ?

In agricultural applications, a hose submerged in a spray tank containing toxic material, and not properly protected at the sill cock or pressure tap, can siphon the tank mixture back into the public water supply.



This suction can be created in the water supply by either high demand in the system - fire fighting or main breaks.

CROSS CONNECTIONS AND THEIR CONSEQUENCES

Attention: Commercial & Industrial Facilities !

Cross Connection: Any unprotected connection between any part of a water system used or intended to supply water for drinking purposes and any system containing water or substances that is not or cannot be approved as safe, wholesome and palatable.

The need for an aggressive program of Cross Connection inspection and control, in every public water supply system, has been well established.

Case histories of illness, injury or even death from improper Cross Connections in water distribution systems of the past have been a grim reminder that hazards exist!

This Cross Connection Rule became effective on July 19, 1985 and is known as 320 IAC 3-9.1.

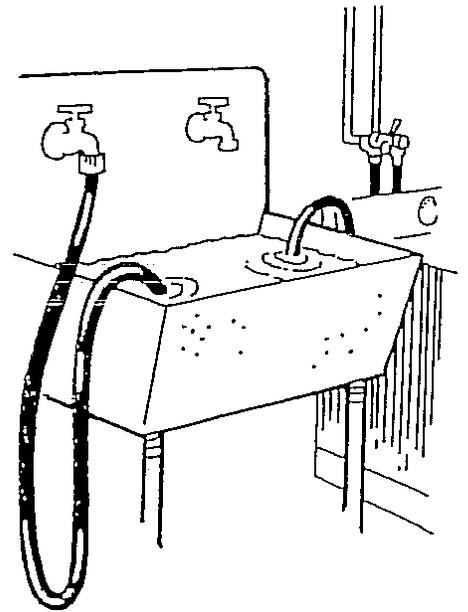
For the many public water supplies in Indiana it will give them an increased voice in how their water must be utilized inside of commercial establishments.

Example: Heretofore, a manufacturing plant could use wholesome water in chemical baths and, without this protective Rule, could accidentally force or siphon this contaminated water back into the supply main of the water works. Thereby, the questionable mix of water and chemicals could be used by an unsuspecting customer further down the supply main.

The rule just enacted with greatly enhance the right of the State and County Health Departments to inspect commercial establishments built after July 19, 1985. Health departments in Indiana should also benefit from the knowledge that those installations, that were deemed to be a hazard by a definition in the Rule, are being monitored periodically by Certified Testers that have trained in this type of specialized inspection.

What is a cross connection ?

A cross connection is a direct arrangement of a piping line which allows the potable water supply to be connected to a line which contains a contaminant. An example is the common garden hose attached to a sill cock with the end of the hose lying in a cesspool. Other examples are a garden hose attached to a service sink with the end of the hose submerged in a tub full of detergent , supply lines to boilers.

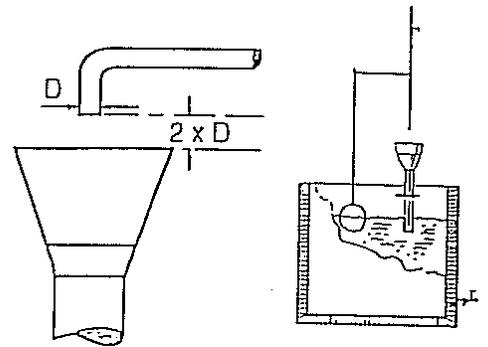


What is the most common form of a cross connection ?

Ironically, the ordinary garden hose is the most common offender as it can be easily connected to the potable water supply and used for a variety of potentially dangerous applications.

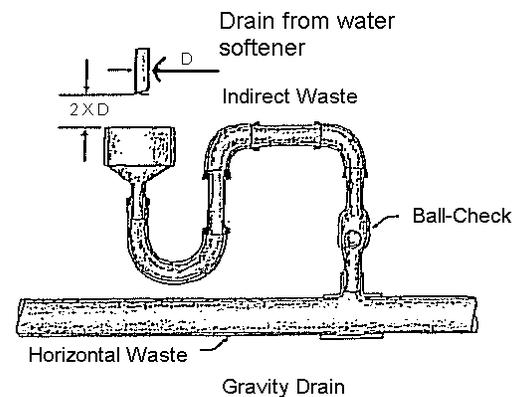
The Ultimate Form of Protection against a cross connection is an Air Gap.

Air Gap is the physical separation of the potable and non-potable system by an air space. The vertical distance between the supply pipe and the flood level rim should be two times the diameter of the supply pipe, but never less than 1". The air gap can be used on a direct or inlet connection and for all toxic substances.



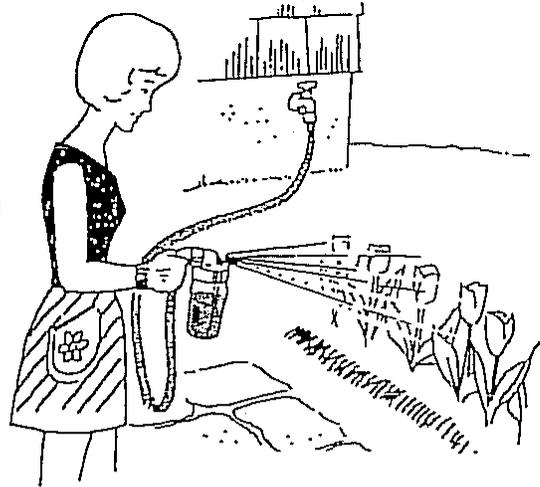
### INDIANA PLUMBING CODE

Direct connections between potable water piping and sewer connected wastes shall not exist under any condition, with or without backflow protection. Where potable water is discharged to the drainage system, it shall be by means of an approved air-gap of two pipe diameters of the supply inlet, but in no case shall the gap be less than 1".



What is potentially dangerous about an unprotected sill cock?

The purpose of a sill cock is to permit easy attachment of a hose for outside watering purposes. However, a garden hose can be extremely hazardous because they are left submerged in swimming pools, lay in elevated locations (above the sill cock) watering shrubs, chemicals sprayers are attached to hoses for weed-killing, etc.; and hoses are often left laying on the ground which may be contaminated with fertilizer, cesspools, and garden chemicals.

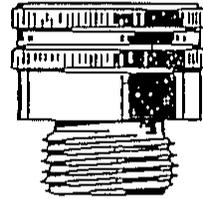


What protection is required for sill cocks ?

A hose bibb vacuum breaker should be installed on every sill cock to isolate garden hose applications thus protecting the potable water supply from contamination.

Where is a Hose Bibb Vacuum Breaker used?

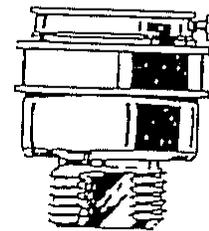
Hose Bibb Vacuum Breakers are small inexpensive devices with hose connections which are simply attached to sill cocks and threaded faucets or wherever there is a possibility of a hose being attached which could be introduced to a contaminant. However, like the Atmospheric Vacuum Breaker they should not be used under continuous pressure.



Hose Bibb Vacuum Breaker  
Watts 8

Should a hose bibb vacuum breaker be used on frost-free hydrants ?

Definitely, providing the device is equipped with means to permit the line to drain after the hydrant is shut-off. A "removable" type hose bibb vacuum breaker could allow the hydrant to be drained, but the possibility exists that users might fail to remove it for draining purposes, thus defeating the benefit of the frost-proof hydrant feature. If the device is of the "Non-Removable" type, be sure it is equipped with means to drain the line to prevent winter freezing.



Hose Bibb Vacuum Breaker  
for Frost-Proof Hydrants  
Watts NF8

# HARDNESS

Hardness is a measure of the concentration of calcium and magnesium salts in water. They are generally present as bicarbonate salts. Water hardness is derived largely from contact with soil and rock formations. Hard waters usually occur where topsoil is thick and limestone formations are present. Soft waters occur where the topsoil is thin and limestone formations are sparse or absent.

## SIGNIFICANCE

Hard and soft waters are both satisfactory for human consumption. However, consumers may object to hard water because of scaling problems it causes in household plumbing fixtures and on cooking utensils. Hardness is also a problem for industrial and commercial users because of scale buildup on boilers and other equipment.

Water most satisfactory for household use contains about 75 to 100 mg/L as CaCO<sub>3</sub>. Waters with a hardness of 300 mg/L as CaCO<sub>3</sub> are generally considered too hard. A recent trend in water plant softening has been to partially soften water to 75 to 150 mg/L as CaCO<sub>3</sub>, which reduces chemical costs over complete softening and provides water acceptable to the consumer.

Very soft waters, found in some sections of the United States, have hardness concentrations of 30 mg/L as CaCO<sub>3</sub> or less. These waters are generally corrosive and are sometimes treated to increase hardness.

**TABLE 11-1 Comparative classifications of water for softness and hardness**

Classification	mg/L as CaCO <sub>3</sub> *	mg/L as CaCO <sub>3</sub> +
Soft	0 – 75	0 – 60
Moderately hard	75 – 150	61 – 120
Hard	150 – 300	121 – 180
Very hard	Over 300	Over 180

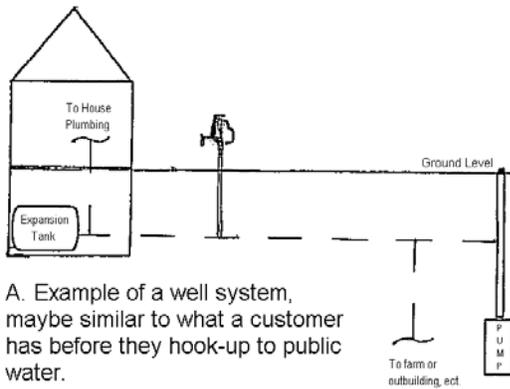
Source: Adopted from Sawyer 1960 and Briggs and Ficke 1977.

\*Per Sawyer (1960)

+Per Briggs and Ficke (1977).

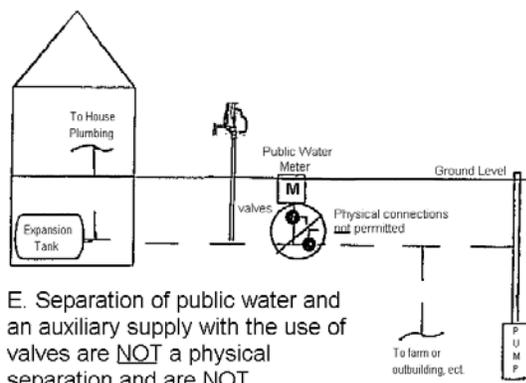
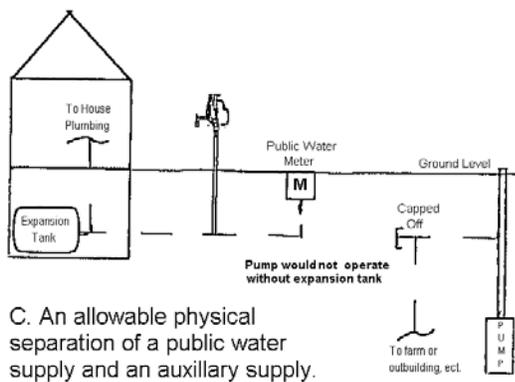
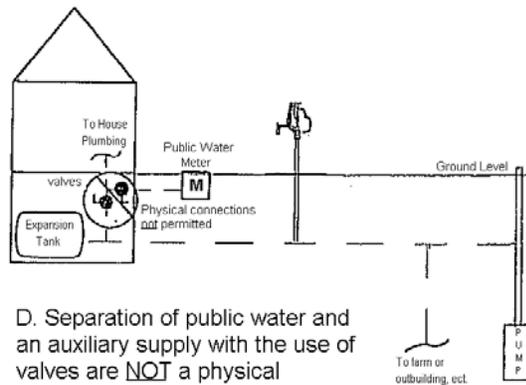
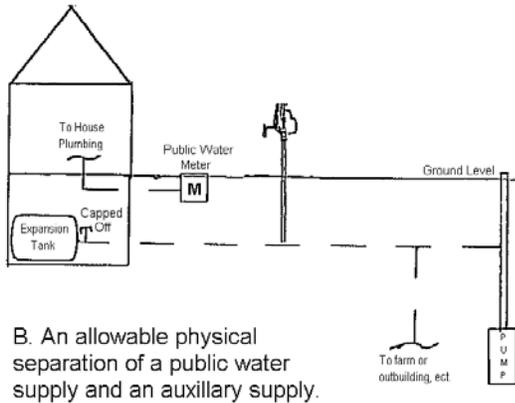
Patoka Water's Hardness is approximately 95 mg/L as CaCO<sub>3</sub>.

## PUBLIC & SECONDARY SOURCE OF SUPPLY WATER PIPING

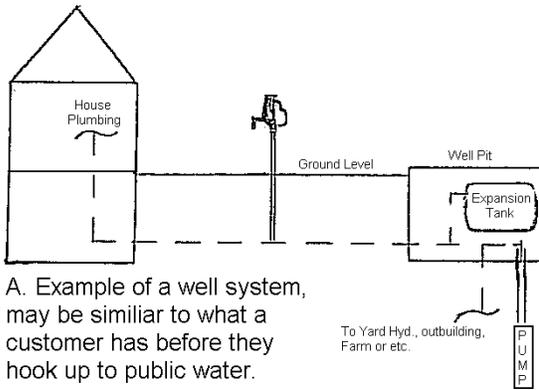


IDEM'S Cross-Connection Rule (IAC 8-10-5) states; No secondary source of supply shall have a physical connection to the public water supply. Here are some examples that are allowable and what are **NOT** allowable, with or without a backflow prevention assembly.

It is best if the physical separation can be made in a place where future visible inspections can be made, such as in the house or well pump pit; as shown in example "B". If the physical separation is made underground the customer maybe required to expose the separation at their expense, so the "District" can make a visible inspection; as shown in example "C".



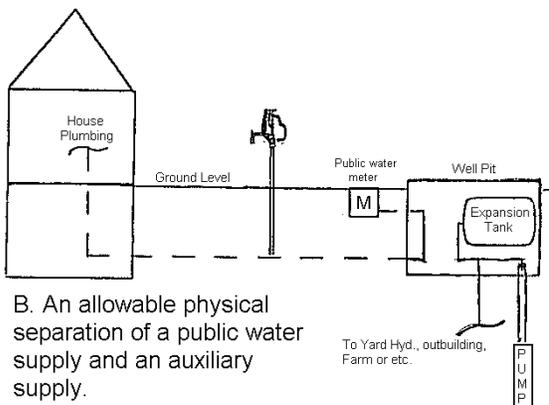
## PUBLIC & SECONDARY SOURCE OF SUPPLY WATER PIPING



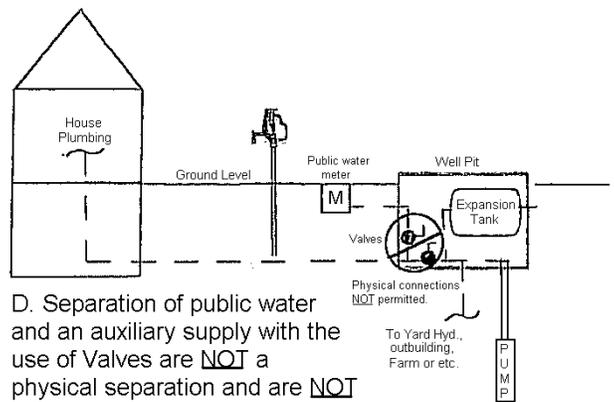
A. Example of a well system, may be similar to what a customer has before they hook up to public water.

IDEM'S Cross-Connection Rule (IAC 8-10-5) states; No secondary source of supply shall have a physical connection to the public water supply. Here are some examples that are allowable and what are **NOT** allowable, with or without a backflow prevention assembly.

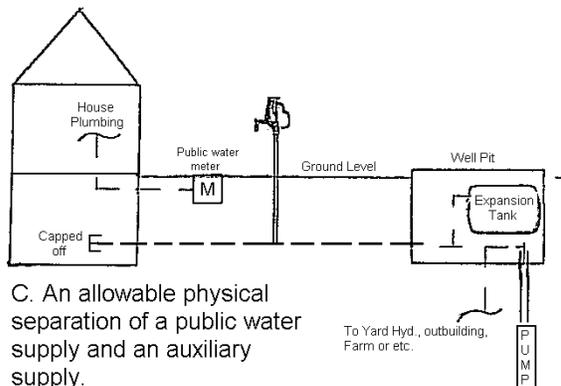
It is best if the physical separation can be made in a place where future visible inspections can be made, such as in the house or well pump pit; as shown in example "B" & "C".



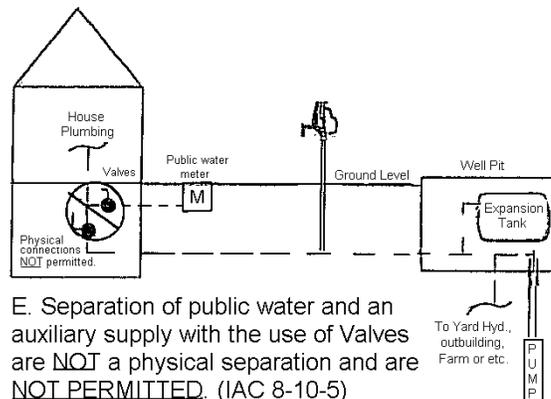
B. An allowable physical separation of a public water supply and an auxiliary supply.



D. Separation of public water and an auxiliary supply with the use of Valves are **NOT** a physical separation and are **NOT PERMITTED.** (IAC 8-10-5)

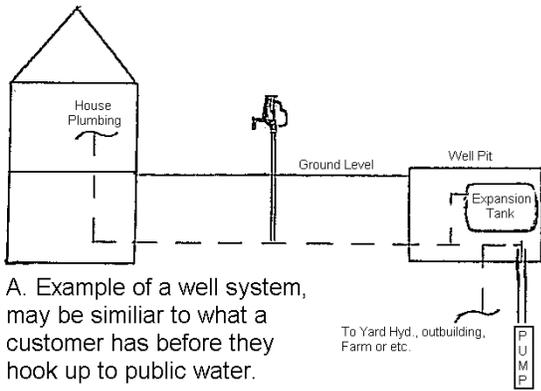


C. An allowable physical separation of a public water supply and an auxiliary supply.



E. Separation of public water and an auxiliary supply with the use of Valves are **NOT** a physical separation and are **NOT PERMITTED.** (IAC 8-10-5)

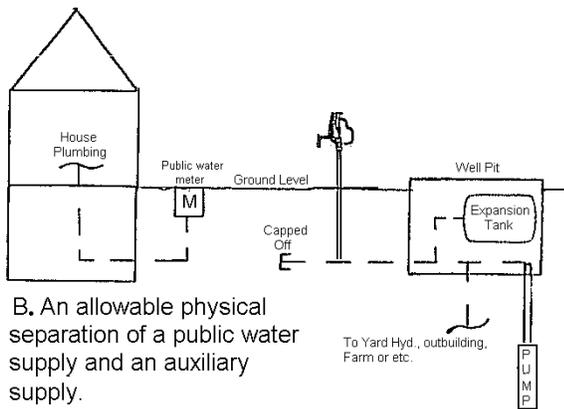
# PUBLIC & SECONDARY SOURCE OF SUPPLY WATER PIPING



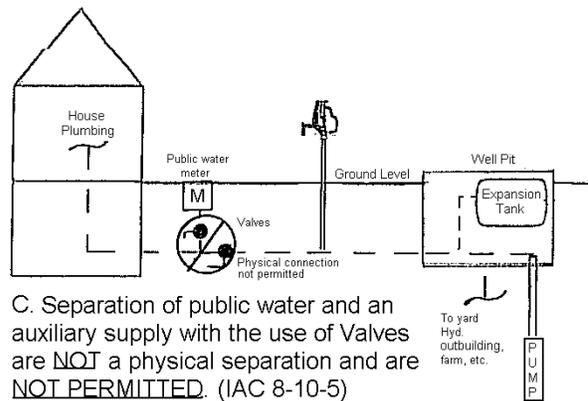
A. Example of a well system, may be similar to what a customer has before they hook up to public water.

IDEM'S Cross-Connection Rule (IAC 8-10-5) states; No secondary source of supply shall have a physical connection to the public water supply. Here are some examples that are allowable and what are **NOT** allowable, with or without a backflow prevention assembly.

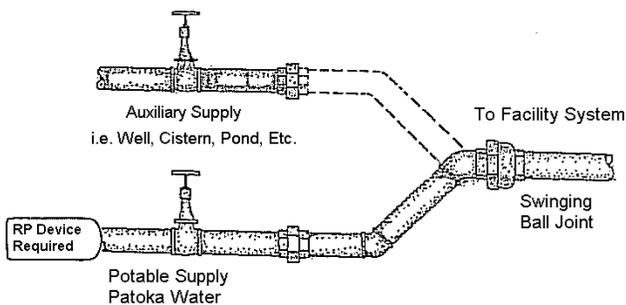
If the physical separation is made underground the customer maybe required to expose the separation at their expense, so the "District" can make a visible inspection; as shown in example "B".



B. An allowable physical separation of a public water supply and an auxiliary supply.



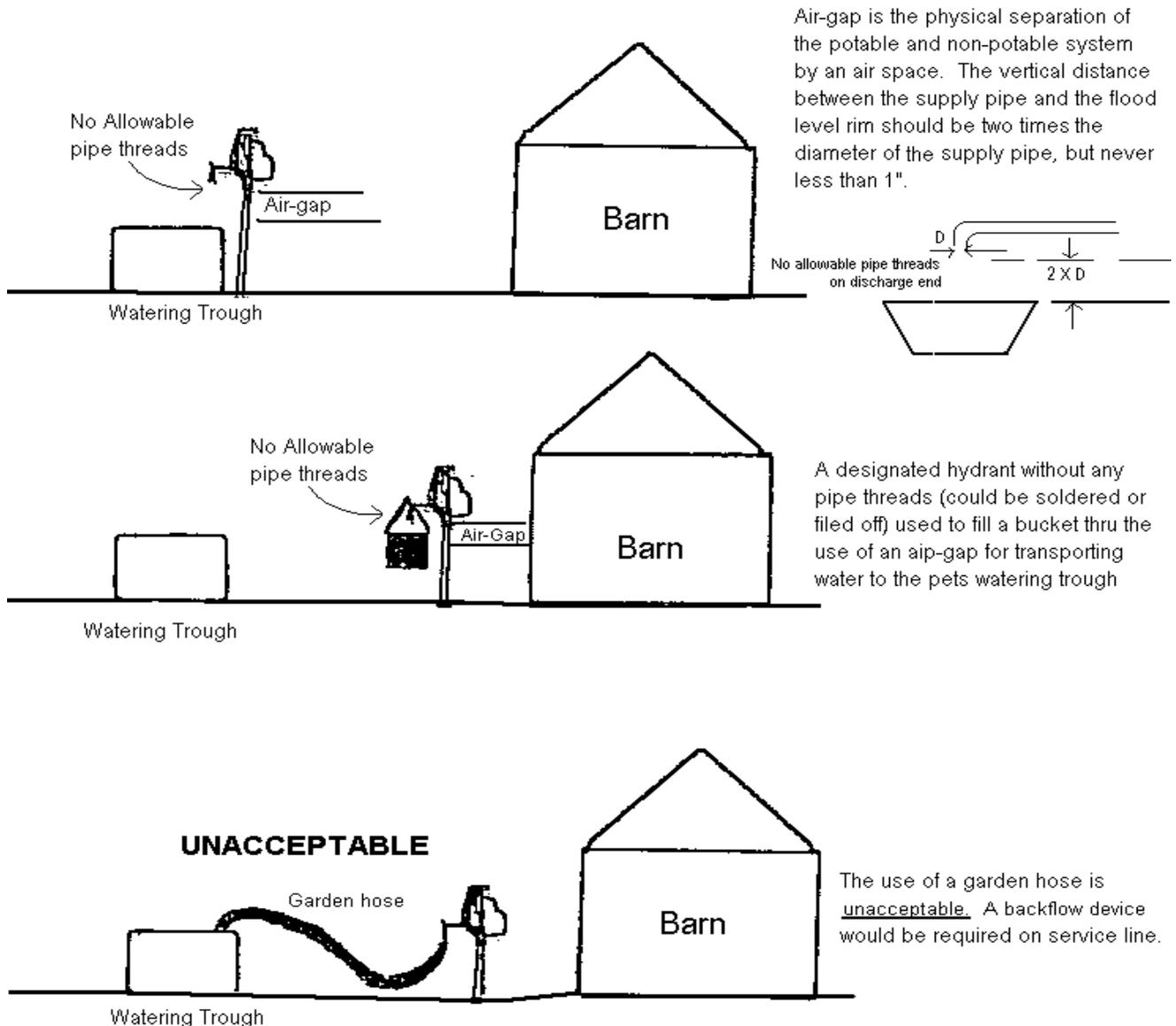
C. Separation of public water and an auxiliary supply with the use of Valves are **NOT** a physical separation and are **NOT PERMITTED**. (IAC 8-10-5)



If the customer chooses to alternate from public supply to auxiliary supply a reduce pressure backflow prevention assembly is required on the customer potable water service line. In addition to the backflow prevention assembly, the line to the facility must be permanently connected and be able to alternate from potable to auxiliary supply by using the same connection, this would eliminate the two supplies being physically connected at any time (As shown to the left).

## WATERING PETS WITH AN AIR-GAP

Ironically, the ordinary garden hose is the most common form of a cross-connection as it can be easily connected to the potable water supply and used for a variety of potentially dangerous applications. The concern that exist with watering troughs are they may contain fecal coli form or e. coli that are components of humans and warm blooded animals; which could be siphoned back into the drinking water by means of a garden hose submerged in a watering trough. The District’s Cross-connection control Ordinance No. 1991-2 requires a backflow device to be installed on a customer’s service line if public water is used to fill watering troughs with a garden hose. If approval from the “District” is granted and the following air-gaps are constructed, water provided by the “District” could be used to fill watering troughs for a few pets. The only allowable air-gap is a yard hydrant without any pipe threads (soldered or filed off) or other attachments to the discharge end of the hydrant, or using a designated hydrant without any pipe threads to fill a bucket for transporting water to the pets watering trough; **THE USE OF A HOSE IS UNACCEPTABLE**, If these methods and or types of air-gaps cannot be constructed and maintained the only other alternative is to install a backflow device. These air-gaps must be inspected annually by the “District”.



## A30-E AND BACKFLOW PREVENTOR INSTALLATION GUIDELINES

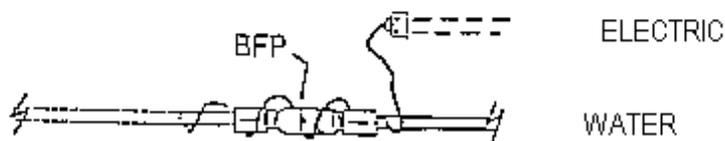
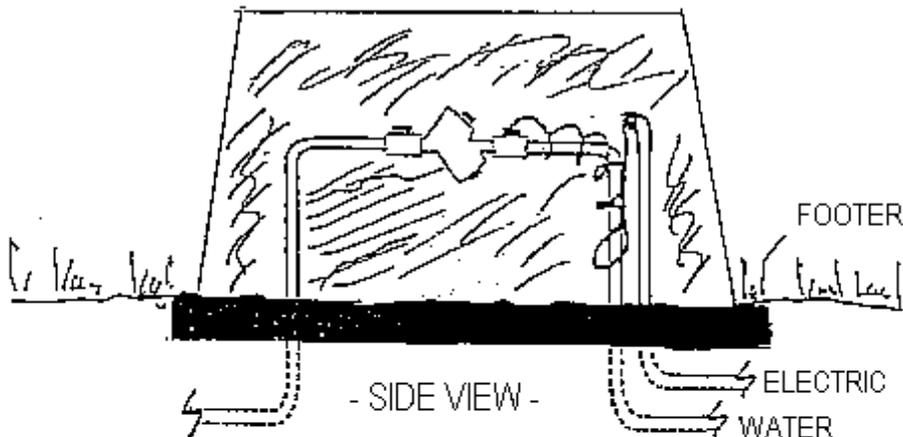
At this time the “District” is providing State Approved backflow devices the same size as the meter for their metered customers that are required to have one installed. The device is to be installed at or near the meter on the customer’s service line before any tees or taps. The “District” will provide the equipment and labor for the installation if the device immediately follows the meter. If the device does not immediately follow the meter the customer may be required to supply both equipment and labor for installation; the “District” will still supply the backflow device. The plumbing code requires that all backflow devices be adequately protected against freezing weather, i.e. heat tape, etc; this is the customer’s responsibility. In the event the device is damaged by freezing or other careless acts, it is required that the owner of the property it serves reimburse the “District” for any part, labor and or new devices that may be required. At this time the “District” is supplying regular tests and repair parts if needed for metered customers, every six months, with the exception of freezing or other careless acts.

### DISTRICT’S INSTALLATION

1. Install Backflow device at meter
2. Place A30-E over Backflow device and anchor onto a concrete pad.

### CUSTOMER SITE PREPARATION

1. Provide 120V, ground fault protected, circuit to Backflow device. Mount outlet 6” above discharge point of RPZ units. All wiring protruding through the ground or that is lying on the ground should be installed in conduit to prevent shorting or fire due to mice nesting or chewing on the wires.
2. Install heat tape onto Backflow device.



- PLAN VIEW -

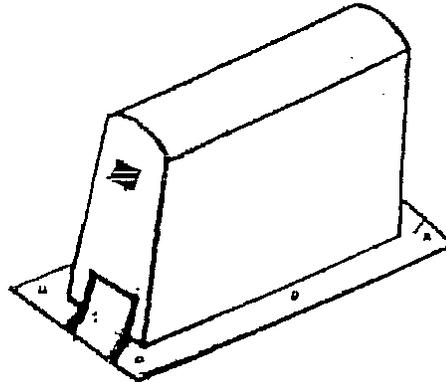
# **ECONOMY SERIES ENCLOSURES**

(Standard-Encapsulated)

## **Dimensions**

<b><u>Model</u></b>	<b><u>Length</u></b>	<b><u>Width</u></b>	<b><u>Height</u></b>	<b><u>Flange Size</u></b>	<b><u>Weight</u></b>
A30 - E	27"	10"	18"	34" X 18"	21 lbs.
A41 - E	38"	13"	27"	45" X 20"	26 lbs.
A51 - E	47"	13"	30"	55" X 20"	42 lbs

(Inside Demensions)



- \* Fiberglass enclosures have 1" encapsulated insulation with 1/8" fiberglass inner and outer walls.
- \* Built in drain valve.
- \* Forest green in color.
- \* One-piece construction.
- \* Standard series designed to cover devices for sizes 3/4" - 2"

1991-001

**DATE OF OCCURRENCE:** June, 1991  
**LOCATION:** Casa, Arkansas  
**SOURCE OF INFORMATION:** "Rural Water"  
"Arkansas Drinking Water Update"

**SUMMARY:** The failure of two single check valves in a series (unapproved backflow preventer) on the service line to a commercial chicken house permitted the backflow, into the public water system, of an antibiotic administered to chickens through the chicken house water system.

**DETAILS:**

In response to complaints from a customer on the Casa water system, it was determined that the water system was contaminated by backflow from a commercial chicken house. The chicken house had been receiving water from both the public water system and an auxiliary well connected to the chicken house plumbing. The water system connected to the chicken house included two single check valves in series for backflow prevention. The water in the chicken house was being used to administer an antibiotic solution to the chickens.

During the week of June 23, 1991 residents in the area served by the water main became concerned when the water became noticeably discolored. When made aware of the problem, the water system manager shut off the water service to the chicken house and flushed the water line extension servicing the area. The water meter serving the chicken house was later removed until proper backflow prevention could be assured.

The presence of the antibiotic in the water could have caused severe effects in humans who were hypersensitive to the drug. Due to these and other concerns, chicken and brooder houses are considered to be a high health hazard requiring the installation of a reduced pressure backflow prevention assembly. According to the Cooperative Extension Service, there are estimated to be at least 12,000 chicken houses in Arkansas, and it can be assumed that most, if not all of these houses administer a variety of necessary chemicals to their stock.

1990-004

**DATE OF OCCURRENCE:** February, 1990  
**LOCATION:** Seattle, Washington  
**SOURCE OF INFORMATION:** Seattle Water Department  
"Seattle Post Intelligencer"

**SUMMARY:** A valve separating the potable water system and an auxiliary water supply to an irrigation system was accidentally opened by the fire department during a routine inspection, permitting water from a pond to be pumped into the potable water system at a golf course.

**DETAILS:**

On February 23, 1990 the Seattle Water Department received a complaint of discolored water from a customer in a neighboring water system that obtains its supply from the Seattle system. On February 23 and 24, 1990 positive total coliform and fecal coliform test results were received from water samples taken from a routine sample collection site near the point of supply to the neighboring system.

An investigation of water service and metering information revealed the existence of an auxiliary irrigation system supplying a golf and country club. Fluoride analysis of the water confirmed the existence of the auxiliary supply.

The golf course irrigation system was supplied from a pond on the property. A valve separating the potable water system from the irrigation system was opened by fire department personnel during a fire system inspection.

The cross connection was quickly detected because the regular sampling location for monitoring bacteriological quality was located at the club house kitchen. Bacteriological contamination of a water system through a cross connection is very difficult to trace.

1990-001

**DATE OF OCCURRENCE:** Summer, 1990  
**LOCATION:** Brentwood, Tennessee  
**SOURCE OF INFORMATION:** Astra Industrial Services

**SUMMARY:** During the summer of 1990, approximately 1,100 guests of a racquet and country club became ill with an intestinal disorder in two mass incidents after consuming the club's contaminated water supplied from an auxiliary well.

**DETAILS:**

During the summer of 1990, approximately 1,100 guests of a racquet and country club became ill with an intestinal disorder in two mass incidents after consuming the club's contaminated water. The club obtained water from both the public water system and an unauthorized private well.

In 1984 the club informed the city that it had dug an additional well and connected it to the club's plumbing to permit the club to operate completely from the well. A month later the city requested that an approved backflow preventer be installed on the service line since the club violated state and local health laws prohibiting cross connections. The city lacked staff to follow up on the request and never inspected the facilities.

In August, 1990 it was discovered by state investigators that the club's well was unsealed and located 10 feet from a malfunctioning sewage pumping station. Club employees reported that a pool of fecal contaminated water between the well and the sewage pumping station appeared to be sucked into the ground whenever the well's pump was activated.

The city was alerted that the club was using an auxiliary water supply by the fact that water bills showed usage fluctuations between zero and 848,000 gallons a month between August 1989 and October 1990. The City of Brentwood was cited by the State for failing for two years to inspect and monitor any of the 69 locations the city considered as possible sources of contamination to its water supply (cross connections). The city stated that it lacked sufficient staff to inspect all the buildings. Instead, the city chose to focus on inspecting newly built structures.

1989-006

**DATE OF OCCURRENCE:** October, 1989  
**LOCATION:** Kennewick, Washington  
**SOURCE OF INFORMATION:** City of Kennewick,  
Washington Department of Health

**SUMMARY:** A "dirty, black water" complaint alerted the water purveyor to the cross connection of seven water softeners to the sewer line.

**DETAILS:**

On October 4, 1989 the City of Kennewick Water Department received a complaint from a customer concerning "dirty, black water". The water department cross connection specialist investigating the complaint determined that the "dirty water" incident was confined to the customer's house.

A water softener was found in a closet off the family room. The discharge hose was inserted approximately 4-inches into the sewer line. The black "gunk" found at the end of the discharge hose was recognized by the homeowner as being like the black stuff that came out of the bath tub faucet.

The distributor for the water softener stated that installation of the softeners is done by independent contractors. The distributor could only provide a list of softener sales for the last two years. Of the nineteen units sold, six units were sold to other customers in Kennewick.

An inspection was made of these six units. All were cross connected to a sewer line. At one location the homeowner reported "dirty yellow smelly water" had occurred in June of 1989.

All of the water softeners inspected were by-passed until their discharge pipe was isolated with an approved air gap.

1988-016

**DATE OF OCCURRENCE:** November, 1988  
**LOCATION:** Cave Creek, Arizona  
**SOURCE OF INFORMATION:** Phoenix Gazette, Nov. 2, 1988

**SUMMARY:** Illegal private wells are suspected as source of contamination of arsenic in the city water supply.

**DETAILS:**

Health officials, puzzled by high levels of arsenic in the Cave Creek water supply, advised anyone with illegal private wells to disconnect them from the home and use that water for purposes other than drinking and cooking.

Authorities believe that source of the poisoning may be illegal wells contaminating the system. Through a cross connection, water from private wells in homes also hooked up to the Cave Creek Water Co.'s municipal system could infiltrate the city's supply.

The municipal water system suspected that the arsenic naturally occurring deposits cannot manufacture arsenic, it is usually leaches into a well from found in rock formations and soil.

The arsenic levels in the Cave Creek supply are dangerous only if ingested over a 20 to 40 year period. State law sets the maximum contaminant level for the poison at 0.05 mg/l. Cave Creek's water samples averaged 0.072 mg/l.

1988-Q15

**DATE OF OCCURRENCE:** June, 1988  
**LOCATION:** Bella Glade, Florida  
**SOURCE OF INFORMATION:** "The Gainesville Sun" June 26, 1988  
"Tampa Tribune" June 25, 1988

**SUMMARY:** A man died of an insecticide intoxication after drinking water from a bottle filled with contaminated water from a faucet at an airstrip.

**DETAILS:**

A city worker who died a day after cutting grass near an airstrip was killed by pesticides, but officials aren't sure how the poison got into a bottle of water the man sipped from as he worked.

The man got off his riding mower near the grass airstrip to fill his bottle from a faucet. He drank the water and continued working, but then fell ill and went to the hospital, where he died the next morning.

The Chief Medical Examiner's report shows "Complications due to insecticide intoxication and chronic alcoholism" killed the man. The report also shows his blood-alcohol level as 0.23 percent.

Water from the faucet used to fill the bottle is often used to dilute pesticides that are pumped into crop dusting planes, and officials speculate that insecticides had been sucked into the water line. Samples taken later from the faucet did not show any trace of pesticide.

1987-010

**DATE OF OCCURRENCE:** June, 1987  
**LOCATION:** Gridley, Kansas  
**SOURCE OF INFORMATION:** "The Gridley Gleam", Vol 5, No. 6

**SUMMARY:** The water supply to ten residences and one business were contaminated with the herbicide Lexon DF as a result of backsiphonage caused by a water main break.

**DETAILS:**

On June 20, 1987 a resident of Gridley, Kansas returned home after several days absence and noticed a chemical smell when filling the washing machine. City officials concluded that the problem was caused by "sludge in the pipes" that had been flushed out when the water came back on and recommended that the pipes be flushed for a couple of hours.

On July 1, the resident complained that there was still a problem and that the grass had died where it was watered. City officials then contacted the State Department of Health and Environment.

The State officials took water samples to determine if there may have been chemical contamination. It was concluded that some water mains were contaminated with a herbicide, later identified as Lexon DF, following the break in a water main on June 17. A tank at a nearby feed store which had contained the herbicide was being filled with water at the time of the water main break and some of the contents of the tank were siphoned into the water main.

The State officials warned the ten residences and one business supplied by the water main not to use the water for cooking or drinking until test results showed the water was safe. They also noted that if herbicide was present in the water, boiling the water would not destroy it.

1979-003

**DATE OF OCCURRENCE:** June 1979  
**LOCATION:** Meridian, Idaho  
**SOURCE OF INFORMATION:** Department of Health and Welfare,  
State of Idaho

**SUMMARY:** The backsiphonage of "stagnant water" containing high bacterial counts occurred from a fire sprinkler system through a leaking alarm check valve.

**DETAILS:**

On June 18, 1979 the residents of the City of Meridian, Idaho reported their water supply had an odor and taste of onions. During this period, the city was routinely flushing fire hydrants throughout the area involved. As with the complaints, the odor would occur but a consistent pattern could not be determined. The city's water system is supplied by four wells and a 500,000 storage tank which rides on the system. The wells have an alternate pumping schedule and the water system is looped. This arrangement had a contributing affect on the odor occurrence.

By isolating portions of the water system, and conducting a premise by premise inspection, the source of the contamination was narrowed to one area containing a supermarket, car wash and a church printing firm. The nearest fire hydrant was flushed and the odor became very strong. The final inspection revealed that the alarm check valve on the fire sprinkler system in the supermarket was leaking. When the city water pressure was reduced during hydrant flushing, the alarm check valve clapper would leak, but the clapper would not open enough to set off the alarm. When the service was turned off to the supermarket, the odor and taste problem did not occur during hydrant flushing. Water samples taken from the sprinkler system identified *Clonothrix fusa* and *Zoogleora ramigera* bacteria in sufficient concentration that would cause the onion taste and odor problem.

1979-001

**DATE OF OCCURRENCE:** March 1979  
**LOCATION:** Kulm, North Dakota  
**SOURCE OF INFORMATION:** American Water Works Association  
"Opflow", May 1979

**SUMMARY:** Contamination of a municipal water system by DDT due to backsiphonage from a garden hose type aspirator sprayer.

**DETAILS:**

During the summer of 1979 the residents of Kulm, North Dakota complained that their water had an iodine-like taste. The water left a burning sensation on the lips and throat for 10 to 15 minutes. Residents reported both the burning sensation and minor stomach disorders. Both the southeast and north side of town was affected. The mayor notified the state health department. The National Guard was called in to provide an alternate supply of water.

The distribution system was flushed eight times over a period of three days to remove the contamination. Laboratory analysis confirmed the presence of DDT at both locations. A trace amount of DDT was found in the samples taken after repeated flushing of the system, however, none of the levels were high enough to be toxic to humans.

Backflow prevention and cross connection control in Kulm was reviewed. During the survey, two Kulm residents were found filling sprayers containing herbicide with their garden hoses. The ends of the hoses were immersed in the herbicide water and the hoses had no backflow preventer. If a negative pressure developed in the water system, the herbicide could have been drawn into the water system.

Apparently this is how the DDT was introduced. Subsequent demands on the system spread the DDT contamination. The ultimate source of the DDT was never found. The identification of the banned substance only adds to complicate the matter. The sampling done by the state health department was done after the fact hence the levels of DDT could have been even higher at the initial time of contamination.

1969-002

**DATE OF OCCURRENCE:** August, 1969  
**LOCATION:** Worcester, Massachusetts  
**SOURCE OF INFORMATION:** FCCCHR, University of Southern California  
Howard D. Hendrickson

**SUMMARY:** 83 football team members and coaching staff were stricken with infectious hepatitis by drinking water contaminated by a backsiphonage incident.

**DETAILS:**

A water line, serving a series of sunken sprinkler boxes used for irrigation, was extended to a faucet used by football player for drinking water during practice. Children played on the field and used the irrigation boxes as toilets, 4 of the children had infectious hepatitis.

Early one morning there was a fire in nearby Worcester, firefighting pumpers reduced the pressure in the water line to the practice field to below atmospheric, causing backsiphonage.

83 football team members and their coaching staff drank the contaminated water at the faucet and became ill with infectious hepatitis. Nearly every game of the season was cancelled.

Subsequent tests made by flooding the boxes with dyed water and opening fire hydrants in the area below the practice field showed water could flow from the pits to the faucet.



**PATOKA LAKE REGIONAL WATER & SEWER DISTRICT  
2647 N STATE ROAD 545 DUBOIS, IN 47527 812-678-5781**

CUSTOMER	LOCATION #			
LOCATION	<input type="checkbox"/> PLUMBING <input type="checkbox"/> IRRIGATION <input type="checkbox"/> FIRE SERVICE			
MAKE & MODEL	SIZE	SERIAL #		
	<b>REDUCED PRESSURE ASSEMBLY</b>			
	<b>DOUBLE CHECK VALVE</b>			
<b>INI- TIAL TEST</b>	CHECK VALVE # 1	CHECK VALVE # 2	RELIEF VALVE	<b>PVB/AVB</b> AIR INLET
	Held at _____ PSID Leaked	Held at _____ PSID Leaked Closed Tight in direction of flow at _____ PSID	Opened at _____ PSID  Opened under 2 lbs or did not open _____	Opened at _____ PSID  Opened under 1 lb or did not open _____
<b>R E P A I R S</b>	<b>Cleaned Replaced</b>	<b>Cleaned Replaced</b>	<b>Cleaned Replaced</b>	CHECK VALVE Held at _____ PSID Leaked
				<b>Cleaned Replaced</b>
<b>FINAL TEST</b>	Held at _____ PSID	Held at _____ PSID  Closed Tight in direction of flow at _____ PSID	Opened at _____ PSID	Air Inlet _____ PSID  Check Valve _____ PSID

**RP  
DC  
PVB  
  
AVB  
DCDA  
  
RPDA**

Meter Reading \_\_\_\_\_

Shut-Off Valves on Fire Line

Wire Sealed \_\_\_\_\_

Chain Locked \_\_\_\_\_

Inlet Water Pressure: \_\_\_\_\_

Backflow Assembly YES

Freeze Protected? NO

Test Gauge M/N: \_\_\_\_\_

Water Service Restored: YES

Date of last gauge Calibration: \_\_\_\_\_

NO

**COMMENTS:**

**I CERTIFY THAT THE ABOVE INFORMATION IS TRUE.**

Initial test by (signature) \_\_\_\_\_

Tester No. \_\_\_\_\_

Date \_\_\_\_\_

Repaired by \_\_\_\_\_

Date \_\_\_\_\_

Final test by (signature) \_\_\_\_\_

Tester No. \_\_\_\_\_

Date \_\_\_\_\_

**OWNER PLEASE SIGN ON BACK OF FORM**

The Indiana Department of Environmental Management, Title 327 IAC 8-10 and Patoka Lake Regional Water & Sewer Districts Ordinance No. 1991-2 requires the owner of any premises in which a backflow prevention assembly device is installed at the utilities service connection to have certified tests made of such devices. Water tightness and reliability tests are required at intervals not exceeding one year for an air-gap, double check, double check detector, and pressure vacuum breakers; and intervals not exceeding six months for reduced pressure devices. More frequent testing may be required if history indicates frequent failures or noncompliance. If these requirements are not met the "District" has the right to terminate water service. This form must be signed by the owner, water supervisor and tester.

With the above listed devices being tested, the customer must realize the following:

- A. That at this time the "District" is supplying factory repair parts, labor, and a state certified tester for their immediate customers, unless otherwise stated below.
- B. That the backflow device was tested and met operational parameters on the date of the test. If the unit did not meet these standards, it would be cleaned and rebuilt with original factory parts immediately whenever found to be defective.
- C. That it should be understood by all parties, the tester has only warranted relief valve openings and pressure drops across the checks as of the date and time entered and signed off in his report. It is warranted for no time increment into the future.
- D. That although implied, but not often understood, the tester does not warrant the correct operation of any plumbing fixtures etc. located downstream of the tested backflow device following a test. Buildup of foreign material or scale could very easily be dislodged and therefore clog or obstruct various items downstream of the backflow device.
- E. That the water has to be briefly shutoff for adequate testing of the backflow device and then restored on completion. The owner must realize the potential problems that shutting off and repressurizing his system will have on his equipment etc., i.e. flooding or being without water. It is the owner's responsibility to make any arrangements in advance with the tester, if needed.
- F. That the owner has the responsibility to ensure and to provide adequate proof upon demand, that his onsite and internal water system complies with the local and state plumbing and health code requirements, and designate a water supervisor as a contact person with knowledge of the onsite water system.
- G. That the owner is further reminded that the plumbing code requires that all backflow devices be adequately protected against freezing weather, i.e. heat tape, etc (This is the Owners Responsibility). In the event the device is damaged by freezing or other careless acts, it is required that the owner of the property it serves reimburse the "District" for any part, labor and or new devices that may be required.

It is VERY IMPORTANT at this time to inform you, the customer, of the possible problem of thermal expansion produced by a water heater, and in relation to a dual check valve or any other backflow prevention devices installed at your meter. In the event of a temperature and pressure relief valve (T & P valve) or heating element malfunction a backflow device prevents the release of thermal expansion back into the water main, therefore causes the water to become superheated. The result of superheated water could be loss of life or property damage, due to the explosion of your water heater. The "District" recommends that you inspect your T & P valve periodically. Also a licensed plumber can inspect, repair or replace your T & P valve to insure your safety.

Any customer required to install a low hazard (Double check, model #007 or 709) device must realize that no high hazard activities (mixing or applying chemicals, etc.) may take place on the customer's property without first notifying the cross-connection department at the "District". Failure to notify the "District" 15 (fifteen) business days prior to any changes will constitute FULL liability on the customer/owner from any damages that may result. The telephone numbers to call are (local 678-5781 or long distance 800-313-5589)

I have read the above and fully understand the information given.

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Owner

Water Supervisor (If other than the owner)

Date: \_\_\_\_\_