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Oregon City Public Works
Water Division

-Now South Fork Water
Board

Cross Connection / Backflow Prevention Program

Oregon City is required by Oregon Administrative Rule 333-061-0070 and by Oregon City Ordinance No. 04-1006 to undertake a cross connection control program to protect the public water system from pollution and contamination. The Cross Connection / Backflow Prevention Program is an important component in our overall strategy for consistently providing safe drinking water to all our customers.

What is a Cross Connection?

A cross connection is any actual or potential physical connection between a potable water line and any pipe, vessel, or machine containing a non-potable fluid or has the possibility of containing a nonpotable fluid, solid or gas, such that it is possible for the non-potable fluid, solid or gas to enter the water system by backflow. A cross connection could be any physical arrangement whereby a potable water supply is connected, directly or indirectly, with any non-potable or unapproved water supply system, sewer, drain, conduit, pool, storage reservoir, plumbing fixture, or any other device which contains, or may contain, contaminated water, liquid, gases sewage, or other waste, of unknown or unsafe quality which may be capable of imparting contamination to the potable water supply as a result of backflow. Bypass arrangements, jumper connections, removable sections, swivel or change-over devices, and other temporary, permanent or potential connections through which, or because of which, backflow could occur, are considered to be cross connections.

Backflow occurs when the pressure in the distribution system drops and water is siphoned from the consumer's system into the distribution system. This backsiphonage could happen when the fire department opens one or more fire hydrants during fire fighting, or when there is a break in a water main. Backpressure from a customer's pressurized water-using equipment could also pump nonpotable water back into the public drinking water. Whatever the cause of the backflow condition, the result is potentially dangerous water contamination.

A successful method of protecting the public water supply from pollution or contamination caused by backflow conditions is the installation of backflow prevention assemblies. The type of backflow device needed is dependent on the degree of hazard presented by the backflow water source. Normally, the risk to the water system can be divided into one of two general categories:

Health Hazard (Contamination)

A substance that could pose an immediate health concern because of the risk of death, spread of disease or illness, or injury to the customer if it were introduced into the potable water supply. The substance could constitute a physical, biological and/or chemical hazard. The high health hazard may be considered severe if the substance could pose a

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high risk of death, spread of disease or illness to the customer if it were introduced into the potable water supply. Examples of facilities where high hazard substances are found include wastewater treatment plants, radioactive material processing plants or nuclear reactors, hospitals, medical centers, mortuaries, car washes, and laboratories.

Non-Health Hazard (Pollution)

A substance that would not impose an immediate health concern, but could result in the water in the purveyor's system not meeting drinking water standards, or could interfere with the monitoring of water quality. Some substances do not impose a health concern, but would result in water that is aesthetically objectionable or impose an additional operating cost to the utility. Examples of low hazards include fire sprinkler systems (without chemical additives), lawn irrigation systems (without chemical additives), and tall buildings (over 30 feet).

Policies and Procedures

Oregon City follows guidelines established by the following regulatory agencies in determining the appropriate backflow prevention device for any given situation:

- Oregon Department of Human Services (DHS) – OAR 333-61-025, OAR 333-61-0070, OAR 333-61-0071,
- American Water Works Association (AWWA), Standards C510, C511, and Manual M14,
- AWWA Pacific Northwest Section – Cross-Connection Control Manual, Sixth edition, December 1995, and
- University of Southern California, Foundation for Cross-Connection Control and Hydraulic Research – Manual of Cross Connection Control, Ninth Edition, December 1993.

Oregon City Public Works will conduct inspections and/or surveys in order to determine the existence of, or potential for, cross connections to the public water supply. Whenever a water user or the owner of the premises obtaining water from Oregon City's public water system adds any chemical or substance to the water, they shall notify Oregon City Public Works.

The type of backflow prevention required shall be commensurate with the degree of hazard which exists:

- An approved air gap of at least twice the inside diameter, but not less than one inch, of the incoming supply line measured vertically above the top rim of the vessel, or an approved reduced pressure backflow assembly (RPBA) or reduced pressure detector assembly (RPDA) shall be installed where the substance which could backflow poses a health hazard (contaminant).

- An approved double check valve assembly (DCVA) or double check detector assembly (DCDA) shall be installed where any substance other than potable water could backflow and poses a non-health hazard (pollutant).
- An approved pressure vacuum breaker assembly (PVBA), spill resistance vacuum breaker assembly (SVBA), or an atmospheric vacuum breaker (AVB) shall be installed where the substance which could backflow poses a non-health hazard (pollutant) and where there is no possibility of backpressure in the downstream piping. A shutoff valve may be installed on the line downstream of a PVBA or SVBA, but shall not be installed downstream of an AVB.

Following are premises regarded as health hazards and require isolation by an approved air gap or reduced pressure principle type of assembly:

1. Agricultural (e.g. farms, dairies)
2. Beverage bottling plants*
3. Car washes
4. Chemical plants
5. Commercial laundries and dry cleaners
6. Premises where both reclaimed and potable water are used
7. Film processing plants
8. Food processing plants
9. Medical centers (e.g., hospitals, medical clinics, nursing homes, veterinary clinics, dental clinics, blood plasma centers)
10. Premises with irrigation systems that use the water supplier's water with chemical additions (e.g., parks, playgrounds, golf courses, cemeteries, housing estates)
11. Laboratories
12. Metal plating industries
13. Mortuaries
14. Petroleum processing or storage plants
15. Piers and docks
16. Radioactive material processing plants and nuclear reactors
17. Wastewater lift stations and pumping stations
18. Wastewater treatment plants
19. Premises with piping under pressure for conveying liquids other than potable water and the piping is installed in proximity to potable water piping
20. Premises with an unapproved auxiliary water supply that is connected to a potable water supply
21. Premises where the water supplier is denied access or restricted access for survey
22. Premises where the water is being treated by the addition of chemical or other additives

* A Double Check Valve Backflow Prevention Assembly could be used if Oregon City Water Division determines there is only a non-health hazard at a beverage bottling plant.

All backflow prevention assemblies installed within the Oregon City's water distribution system boundaries shall be of a type and model approved by the DHS. These are assemblies meeting the specifications of construction, evaluation and approval of the above-mentioned regulatory agencies. All assemblies shall be installed in accordance with OAR 333-061-0071. A listing of approved assemblies and installation standards are available from the water division upon request.

The water user or the owner of the premises where one or more backflow prevention assemblies (i.e., RPBA, DCVA, PVB, SVBA, DCDA, or RPDA) have been installed shall have the assemblies tested by a state-certified tester at least once per year. Oregon City Public Works may require more frequent tests at facilities that pose an extreme health risk and for assemblies that repeatedly fail.

Backflow prevention assemblies found not to be functioning properly shall be repaired promptly by the water user or owner of the assembly or Oregon City Public Works may deny or discontinue water service. After a backflow assembly is repaired, installed or moved, the assembly shall be tested prior to use. Tests performed by state-certified testers shall be in conformance with procedures established by the Foundation for Cross Connection Control and Hydraulic Research, Manual of Cross Connection Control, 9th Edition, December 1993, University of Southern California.

Reports on backflow assembly tests shall be prepared by the state-certified tester and copies provided to the water user or the owner of the assembly and to the Oregon City Water Division at the following address:

Oregon City Public Works
CC/BPP Coordinator
122 South Center Street
Oregon City OR 97045

Test reports shall arrive at the water division within 10 working days of the test date. Test reports that are illegible and/or incomplete will not be accepted by Oregon City Water Division. Reports for DCDA's and RPDA's shall include the detector meter reading, preferably on the test report for the bypass assembly.

Testers must forward proof of current Oregon DHS Backflow Assembly Tester certification and gauge calibration to Oregon City Water Division prior to performing tests within the district. A master list of backflow prevention assemblies installed within the Oregon City water distribution system boundaries will be made available upon request. Copy fees will apply. For answers to questions about the Oregon City water distribution system boundaries, or specific assemblies within the boundaries, contact the program coordinator at 503-657-8241.

Non-health hazard assemblies (i.e., DC, DCDA, PVB, and SVBA) that fail to function properly, or fail the established test procedure, shall be repaired or replaced within 30 days. Health hazard assemblies (i.e., RP and RPDA) that fail to function properly, or fail the established test procedure, shall be repaired or replaced within 15 days. If an Oregon City Cross Connection Specialist determines that the hazard poses a threat to public safety, the assembly must be repaired immediately. Delay in repair is cause for discontinuance of water service until repair and re-testing prove the assembly to be functioning properly.

During construction of new water systems (water mains, valves, hydrants, services lines, and other appurtenances), no connection to the existing system shall be made until the new system has passed both pressure and bacteriological testing and has been accepted by the water division. All water used for flushing and testing shall be metered and delivered to the new waterline through DHS approved backflow prevention assemblies. Oregon City Public Works can provide a 2-inch DCVA. If a contractor provides the assembly a state-certified backflow tester should test the assembly and provide a passing test report to an Oregon City Water Division Cross Connection Specialist prior to its use. Only Oregon City Water Division staff are authorized to operate water distribution system valves. Following acceptance of the new water main, final connection to the existing system shall be done under the supervision of the Oregon City Water Division staff.

Type of Water Service

Domestic – backflow prevention is required on services that:

- are commercial in nature,
- are greater than or equal to two-inches in diameter,
- have piping higher than 32 feet above the water main, and
- have a potential hazard to the public water supply.

Irrigation – backflow prevention is required on all irrigation systems.

A packet with information on acceptable methods of backflow prevention for irrigation systems is available upon request. Annual assembly testing should be completed prior to the beginning of each irrigation season – June 30th at the latest.

Fire line – backflow prevention is required on fire sprinkler systems that:

- are greater than or equal to two-inches in diameter,
- have piping higher than 32 feet above the water main,
- use piping material that is not approved for potable water use, and
- do not provide for periodic flow through during each 24 hour period.

An approved DCDA or RPDA shall be installed on all non-residential fire sprinkler systems.

Private fire hydrants – hydrants that dead-end 40 feet or more from the water main:

- require a DCDA or RPDA, to be installed at the owner's property line.

During design of new water systems every effort should be made to loop water mains in order to prevent water quality issues arising from dead-end lines. Hydrant runs should be minimized by placing public fire hydrants on the same side of a street as the water main. Any hydrant with a run greater than 40 feet will be considered a private hydrant and require backflow prevention (DCDA or RPDA).

Backflow prevention assemblies will be installed at a location adjacent to the water meter or point of delivery. With approval of the Oregon City Water Division the assembly may be installed immediately inside the building being served, but in all cases, before the first branch line leading off the service line.

Oregon City Water Division may deny or discontinue water service to the premises where access for cross connection inspection is denied, where there is a failure to install a required assembly, when repairs to a failed assembly are not made within the established time period, and when required tests are not completed. Should water service be discontinued for failure to comply with this program, a fee may be assessed for restoring water service upon receipt of required testing documentation.

Oregon City Water Division will send a "Scheduled Test Notice" for the annual backflow test approximately 10 days prior to the start of the test month. If the water user or owner of the premises fails to respond to this reminder, a "1st Warning Notice" will be sent approximately 65 days after the start of the test month. A "2nd Warning Notice" will be sent 80 days after the start of the test month. A "Final Shut-off" notice will be sent 95 days after the start of the test month. A partial listing of state-certified backflow testers will be included in all reminder notices.

Oregon City Water Division will coordinate with the utility billing office when taking action to discontinue water service for noncompliance with this policy. Water meters for new construction or irrigation will be locked off until required backflow prevention is installed and ready for testing.

Oregon City Water Division Cross Connection / Backflow Prevention Staff

Eli Deberry	Water Division Supervisor	Certified specialist
Jesse Elders	Water Division Crew Leader	Certified tester & specialist
Dean Herman	Utility Worker	Certified tester & specialist
Dave Judah	Utility Worker	Certified tester
Gail Johnson	Water Quality Technician	CC/BPP Coordinator
		Certified specialist
Kevin Horace	Utility Worker	Certified tester

Approved by *Nancy J.T. Kraushaar* Date 4/8/05
Nancy J.T. Kraushaar
City Engineer / Public Works Director