

Beverly Water Department

Residential Guide to Cross Connection

Why should I be concerned about cross connection?

An unprotected or inadequately protected cross connection in your home or work place could contaminate the drinking water not only in your building, but also in neighboring businesses and homes.

Severe illnesses and injuries - even deaths - have been caused by cross connection contamination events that could have been prevented. Unprotected and inadequately protected cross connections have been known to cause outbreaks of hepatitis A, gastroenteritis, Legionnaire's disease, chemical poisoning, body lesions (from exposure through showering), damage to plumbing fixtures and explosions.

How can a cross connection contamination event occur?

Non-potable water or chemicals used in equipment or a plumbing system can end up in the drinking water line as a result of backpressure or back-siphonage. Backpressure occurs when the pressure in the equipment or system such as a boiler or air conditioning unit is greater than the pressure inside the drinking water line. Back-siphonage occurs when the pressure in the drinking water line drops due to fairly routine occurrences such as main breaks, nearby fires and unusually heavy water demand. Contaminants are then sucked out from the equipment or system and into the drinking water line.

Have cross connections been a problem in Massachusetts?

Yes, there have been several incidents in which public drinking water contamination occurred due to cross connections. One of the most severe incidents took place at a Massachusetts college. The entire football team became infected with hepatitis A due to cross connection contamination at a drinking water fountain that was hooked up to an unprotected water line. For more details on this, or a list of other incidents, please contact the Department of Environmental Protection, Division of Water Supply.

What types of potential cross connections can I encounter at home?

The outside watering tap and garden hose tend to be the most common sources of cross connection at home. The garden hose creates a hazard when submerged in non-potable water such as a swimming pool or when attached to a chemical sprayer for weed killing. Garden hoses are also often left lying on the ground and may be contaminated by fertilizer, cesspools or garden chemicals. Other potential household cross connections can occur when a private well is brought on line or when lawn irrigation systems, boilers, dishwashers and other appliances are connected to plumbing. Home businesses such as photo labs and beauty salons can also be a source of cross connections.

What types of cross connections can I encounter at work?

Areas where cross connections can occur at work include: air conditioning or cooling systems, fire protection systems, lawn irrigation systems and high-pressure boilers. In a factory, cross connections may occur within process equipment such as chemical mixing tanks, plating tanks, private wells used for process water and heat exchangers. Other types of businesses that must be protected from cross connections include hospitals, laboratories, mortuaries, piers, docks, marinas, chemical plants and metal plating industries.

How is the public drinking water protected from cross connections?

The best way to protect drinking water is to eliminate every cross connection. When this is not possible, drinking water lines are protected from cross connections by the installation of backflow preventers. There are several types of backflow preventers required and regulated by the Massachusetts Department of Environmental Protection, Division of Water Supply (DEP/DWS). Backflow preventers come in various sizes and types. The device required depends on the health risk associated with the cross connection condition and must be permitted by D.E.P.

Who is responsible for protecting the public drinking water supply from cross connections?

The City of Beverly Water Department is required to survey all industrial, commercial and institutional facilities to make sure that all potential cross connections are identified and eliminated or protected by a backflow preventer. The water supplier is also responsible for inspecting and testing each backflow preventer to make sure that it is providing maximum protection.

What can I do to make sure my water supply is protected from cross connections?

At home:

- Contact your local water supplier to find out what he/she is doing to prevent cross connection contamination incidents.
- Survey your home to make sure you are not unknowingly creating a cross connection.
- Have all changes to your plumbing system performed by a licensed plumber.
- Do not attach any pesticide, chemical or any other non-potable liquid applicators to your water line.
- Install hose bibb vacuum breakers on all outside faucets. The hose bibb vacuum breaker isolates garden hose applications, protecting your drinking water supply from contamination that could be drawn into your home through the hose.

In general:

- Find out all you can about cross connection control from D.E.P., your local water department or a plumbing inspector.

Where can I get more information on cross connections?

For more information on cross connections, contact the Beverly Water Dept or visit <http://www.epa.gov/safewater/crossconnection.html>. You may also contact the Department of Environmental Protection, Division of Water Supply.