Why Do I Need A Backflow Preventer?

Part of a series of documents created by Tim Guishard Enterprises discussing relevant subjects in the groundwater industry.

This document discusses the regulations and reasons to have a backflow preventer at the water meter, where a well exists on Private Property.

INTRODUCTION:

The Federal Safe Drinkwater Act directs the Federal EPA to ensure that water provided by PWS (Public Water Systems) are safe for human consumption. In many states, EPA has then asked that the States take on the task to enforce Federal Regulations, and report back to the Federal EPA. In California that task has been taken on by the California Department Of Public Health (CDPH). The CDPH has then asked individual counties to take up much of the labor, and report to the CDPH who then reports to the Federal EPA. In San Diego County there are certain PWS that report to CDPH, and others that report to the County Department of Environmental Health. Yes there are way too many layers of Government!

In the Safe Drinking Water Act, PWS are tasked to ensure that a specific quality of water is delivered into each home they serve. For some of the contaminants (Bacteria, nitrates, radioactive compounds, to name a few) the water system is only responsible for the water quality to the water meter. For other contaminants (like lead, and copper) the PWS is responsible for water quality into the customers' homes and out the last tap. None of the PWS like the latter!

In order to ensure that water meets the desired goal, PWS test their water on a defined basis, depending on the size of the PWS. Many of the larger PWS test for contaminants like bacteria several times per week.

In California the regulations state that if an alternate water system is on a property that is also served by the PWC, the PWC must protect their water from POTENTIAL contamination. There are a number of things that might be considered an alternate water system, like:

- A privately controlled water well
- A water service from another PWS
- A protection fire water storage tank
- A chemical storage tank
- And more

Protection is defined as: A physical barrier that can be observed or tested to ensure that the water infrastructure operated by the PWS cannot be impacted, by water from an unapproved source and contaminants that might be in this alternate source.

Unless you test your well to the same standards as the PWS, then your well is considered a contaminated water supply. Even if your well is not functioning, or is not connected in any way to the PWS, there is a POTENTIAL that you could make a connection. This is why the PWS then sends you a note to install a backflow prevention assembly, to provide the physical barrier. They send you a note to have it tested annually, to ensure that it is working properly.

Some might say, a check valve prevents water from going backwards, so why can I not install a check valve, or two? The regulations also state that a backflow assembly must be “in-line testable”, “in-line repairable”, with resilient seats, and been rigorously tested by an “Approved” third party. In order to be in-line testable, a backflow assembly has two shut off valves that must be drip tight, to isolate the assembly for testing. A simple check valve is not easily testable, and most must be removed to repair them if repairs are even possible, and have not been approved as an assembly by a third party.

Backflow assembly test results:

While most backflow assemblies test OK, about 10% fail annual testing, and 20% of those need rebuilding or replacement because of internal leakage. With such a small percentage of actual failures, why not extend the testing out to 2-years? Many PWS have thousands of assemblies. If only 2%, in a PWS that might have 4000 assemblies, leak each year then; there are 80 places where contamination might get into their system in one year. Extend the test cycle to 2-years, and now there are 160 places. Do you want to live next door to one of the 160 places?

Some actual backflow events in San Diego County:

Several years ago I was called out to investigate e-coli contamination in an RV park. Even though the water now contained a chlorine residual, the system kept having positive e-coli samples. During my investigation, I suspected that an RV had a water hose connected between their waste water tank and the PWS. This hose was left connected for several days with the hose bib only turned back off. The hose bib was low to the ground, and had a leaking valve stem packing. During this off period, septic water from the RV drained back into the water hose and hose bib. Later the hose was disconnected from the RV tank flushing assembly and a spray nozzle was then attached to the hose, and the hose bib turned back on to use the water at a later time. Now bacteria from inside the hose traveled through the open hose bib, and into the PWS. Prior to the contamination event, the PWS did not maintain chlorine residuals, and they did not have in place a good flushing program.

There were several issues that contributed to contamination; the instructions on these types of flushing accessories state that “the supplied backflow preventer must be installed”. Also the RV park staff had never replaced the hose bib vacuum breakers (a type of backflow prevention device) as a part of routine maintenance. I eventually had to change disinfectants as the bacteria had apparently become chorine resistant, and was able to get good samples over the next several weeks. Park staff replaced all missing hose bib vacuum breakers in the meantime.

A few years ago, I was again called to investigate another e-coli contamination event, this time at a mobile home park in El Cajon. During my investigation I was told that a private well, operated by the MH park owners, was connected to an irrigation system. I drew

a water sample from the well, and got a sample present for e-coli. While trying to isolate the well and irrigation system I found that the well had been improperly connected up-stream of a backflow prevention assembly, that was supposed to prevent the irrigation water from contaminating the park's potable water system. I also found at another location, the irrigation system had been connected to the park's potable water system without a backflow preventer but a simple ball valve.

The improper connections allowed the well to backflow (pump well water into) into the parks potable water system when water park's potable system pressures were low at certain times of the day.

At a church, I once found a drinking fountain that someone had connected to the irrigation system. This irrigation system was supplied with water from a shallow well, which tested present for coliform bacteria. For several months previous, we could not figure out why someone kept turning on the backflow assembly that fed PWS water into the irrigation system. At the time, the well pump was only turned on when the irrigation time clock told the irrigation system to run. Apparently someone was turning on the backflow assembly to get the drinking fountain to work all the time. We immediately removed the drinking fountain.

Over the years, I have been on properties and observed water meters going backwards. Sometimes the property had a well, and sometimes they did not. In one case, the property was fed by two water districts, and someone had inadvertently connected the pipes from each water meter together. On another case, the property was fed by two water meters, each on a different street; water use at a nearby business caused the water pressures to change dramatically on one street and not the other. In all of these cases, backflow assemblies have now been installed at all water meters.

In this era of terrorism:

PWS are concerned that someone might want to attack through the water system. They have run terrorism scenarios, where a terrorist injected a contaminant into a water system through several methods and the effects are terrible. In one scenario, the chemical is injected into a faucet in a motel room, and the terrorist is long gone before his chemicals are totally pumped into the system. This is why PWS are having backflow assemblies installed every commercial building. They have actually run a potential scenario, simulating a terrorist pumping septic waste into a fire hydrant for 5 hours, and no one contacted emergency personnel. Because of that, they are now looking at how to protect fire hydrants from backflow.

Closing:

I hope you can now see why backflow prevention is necessary, and understand why they must be tested.

Tim Guishard Enterprises
3508 Alpine Boulevard
Alpine, CA 91901
timswatersolutions.com
619-589-9433 Office
619-659-8419
guishard@sbcglobal.net

Tim Guishard Enterprises
3508 Alpine Boulevard
Alpine, CA 91901

timswatersolutions.com

619-589-9433 Office
619-659-8419
guishard@sbcglobal.net