

# Why Backflow Prevention Assemblies Require Installation and Regular Testing



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## Why Ongoing Assembly Testing is Necessary

- ▶ "Foamy" water was reported at a concrete plant in Oregon
- ▶ Lab tests of water samples showed the presence of a foaming agent which was not used at the concrete plant.
- ▶ Officials suspected a nearby dairy because a foaming agent backflowed from the dairy a number of years earlier, after which 2 RP Assemblies were installed.
- ▶ Both assemblies failed testing, one completely
- ▶ After both were repaired the contamination of the public water system stopped.

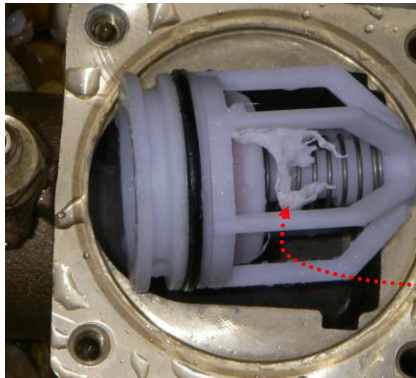
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## Why Ongoing Assembly Testing is Necessary

Rock


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## Why Ongoing Assembly Testing is Necessary

Unknown Crud

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## Why Ongoing Assembly Testing is Necessary

LEVEL!

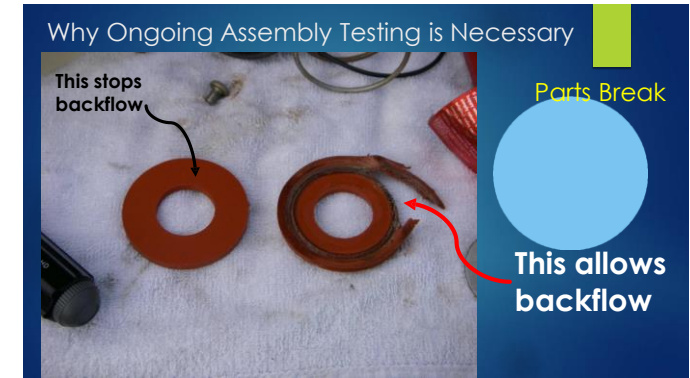
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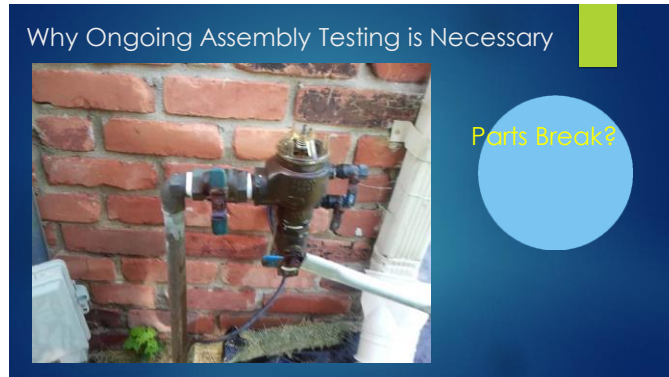
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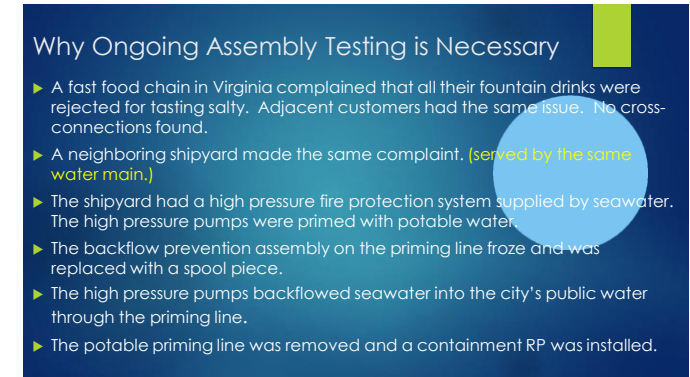
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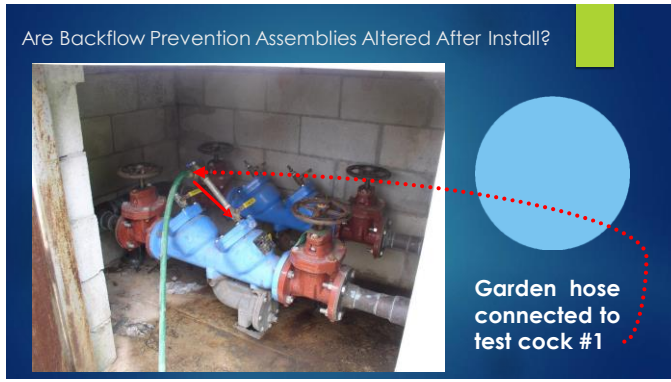
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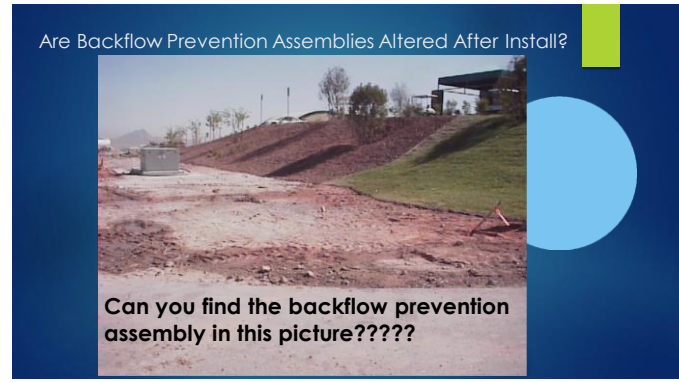
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More Man Made Improper Alterations

Peanut Butter Lid for an Air Inlet Canopy

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More Man Made Improper Alterations

Copper Pipe Cap Soldered Into the Air Inlet Port Rendering this PVB Useless.

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Why Ongoing Assembly Testing is Necessary

- ▶ Two home owners in Southgate MI find parasitic worms, nematodes in their water.
- ▶ One found them swimming around in his bathtub when filling to bathe his child.
- ▶ A water main break caused a vacuum in the public watersystem.
- ▶ The air inlet valve on the vacuum breaker was stuck not breaking the vacuum and the parasites were back syphoned into homes and public water system .
- ▶ Crews flushed all water mains in a 3 square block area until no worms or detectable coliform bacteria were present in water samples.

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Why Ongoing Assembly Testing is Necessary



It can and does happen!

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What Other Animals Might We Find?

**ANTS**

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What Other Animals Might We Find?




**BEEES**

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What Other Animals Might We Find?




Spiders

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What Other Animals Might We Find?



Earwigs

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What Other Animals Might We Find?




Not just insects!

**Lizard**

When was this last tested?

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What Other Animals Might We Find?



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What Other Animals Might We Find?

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**More Horror Stories**

- ▶ E-Coli found in Corpus Christie Water
- ▶ Source was a failed backflow prevention assembly
- ▶ **Failure rates when tested annually - 70%**
- ▶ **Failure rates when tested every 3 years - 30 - 40%**
- ▶ Are your customers exposed to risks and potential health problems if you don't require regular testing?

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## More Horror Stories

- ▶ A failed backflow preventer allowed irrigation water to contaminate 380 homes in Idaho.
- ▶ Dozens of people became ill
- ▶ **Four residents were confirmed to have Campylobacter**
- ▶ **Campylobacter is an infections disease from bacteria**
- ▶ Symptoms include bloody diarrhea, fever, abdominal cramps, nausea and vomiting & **can be life threatening to people with compromised immune systems.**

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**The Idaho Drinking Water Newsletter**  
Department of Environmental Quality Idaho Drinking Water Program

**Water system owner responds quickly to contamination event**  
**Cross-connection incident in southwest Idaho sickens 5 residents**

In June of this year an alert water system, in a southwestern Idaho community, had advanced lead water advisory notices to about 120 customers after water testing indicated the presence of coliform bacteria in the drinking water of two subdivisions.

An unexpected cross-connection  
The harmful contamination of the system's drinking water was caused by an unapproved "cross-connection." The cross-connection in this particular situation was a physical connection (gaging) between the drinking water system and a pressure irrigation system cross-connection.

The standard practice in such a situation is to install a backflow assembly, which prevents the backflow (or reversal) of contaminated water back into a drinking water system through the cross-connection. In this case, the backflow assembly for the irrigation system did not exist. A backflow prevention assembly, but it was installed improperly and the untreated water was mixed into the system's treated drinking water.

Although the "backflow" of all bacteria, the irrigation water may have exposed residents of the subdivisions to possible contaminants beyond the expected test results. Consequently, the local district health department advised physicians to test all residents for Campylobacter, Giardiasis and Cryptosporidium in addition to E. coli.

With the source of the contamination (i.e., the improperly

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## More Horror Stories

## Are Backflow Prevention Assemblies Installed Improperly?

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## Are Backflow Prevention Assemblies Installed Improperly?

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## More Horror Stories

- ▶ Water is commonly used to fill propane tanks prior to being repaired
- ▶ Propane has been known to flow into public water systems in Connecticut where the pressure in the tanks was greater than the water pressure
- ▶ People were injured from flushing toilets
- ▶ Houses and businesses were damaged or destroyed by fires
- ▶ In the Connecticut incident, **high propane backflowed to fill one mile of an 8" diameter water main**

**FLAMMABLE GAS**  
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## More Horror Stories

- ▶ Waste water from a meat packing plant contaminated potable water at a meat packing plant, affecting Millions and 200 jobs while the plant was closed
- ▶ Herbicide Poisoning in Maryland, affecting water supply in


**BIOHAZARD**  
**TOXIC**

In a transport emergency dial 001, British or Fire Brigades. For specialist advice in an emergency only, call 1800 933 111 (24 hours)

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### More Horror Stories

- ▶ An 8 block area was contaminated with "Soapy", "Muddy", "Grey-Green Slippery" recycled wash/rinse water that backflowed from a carwash in Washington.
- ▶ Sodium Hydroxide leaked into the municipal watermain and blisters in the mouth



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### More Horror Stories

- ▶ Blood from an animal entered into a hospital's water supply in Maryland
- ▶ Ethylene Glycol entered into the potable water supply in California leading 9 students to



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### More Horror Stories

- ▶ Pesticides Heptachlor, Chlordane and Dursban backflowed into the public water supply in New Jersey




Flammable      Toxic      Poisonous & Infectious      Systemic Health Hazard

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### Why Ongoing Assembly Testing is Necessary

- ▶ There are dangerous fluids directly and indirectly connected to the potable water supply
- ▶ Scheduled and unplanned events like hydrant flushing, water main breaks and fire fighting create the hydraulics for backflow



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### Why Ongoing Assembly Testing is Necessary

- ▶ Backflow prevention assemblies are mechanical
- ▶ Backflow prevention assemblies fail, are removed, are modified improperly
- ▶ Regular testing will keep the dangerous cross connections protected with properly functioning assemblies

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### Why Ongoing Assembly Testing is Necessary

- ▶ Are traffic signals not maintained at busy intersections because there has not been a fatal accident?
- ▶ Are speed limits near schools raised because a child has not been run over?
- ▶ Do you replace worn tires on your automobile?
- ▶ Are fire drills at schools suspended because there has not been a fire?
- ▶ Regular testing will keep the dangerous cross connections protected with properly functioning assemblies & **public health will be protected**

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## Sources

- ▶ TREEO Center – University of Florida  
<https://www.treeo.ufl.edu/backflow/epa-resources/backflow-case-histories/>
- ▶ American Backflow Prevention Association  
<https://abpa.sle-ym.com/page/incidents>
- ▶ Jim Purzycki – BAVCO
- ▶ Paul Schwartz – FCCC & HR-USC
- ▶ Les O'Brien – Retired TREEO Center – University of Florida
- ▶ Steve Miller – Blue Water Backflow Services
- ▶ Matt Kapcia – City of Troy; The Backflow School
- ▶ Henry Chang – FCCC & HR-USC
- ▶ Kevin Roby – City of Novi – Cross Connection Specialist

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## Questions?

If you would like a copy of this presentation to help support or justify your Cross Connection Control Program contact me at:  
[mlueck@midwestinstrument.com](mailto:mlueck@midwestinstrument.com)

## Thank You!

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