Basic Cross Connection Control Seminar

February 2022

Residential Cross Connection Program

Safe Drinking Water Act - Protecting America's Public Health

MULTIPLE RISKS REQUIRE MULTIPLE BARRIERS

Safe drinking water is essential to the health of American citizens and the economic health of our communities. However, drinking water is vulnerable to contamination from many potential threats. There are programs and activities that when operated effectively form a protective web of multiple barriers to ensure the safety of our drinking water. The success of these barriers relies on the involvement and vigilance of local, state and federal officials, the private sector, public interest groups and individual citizens.

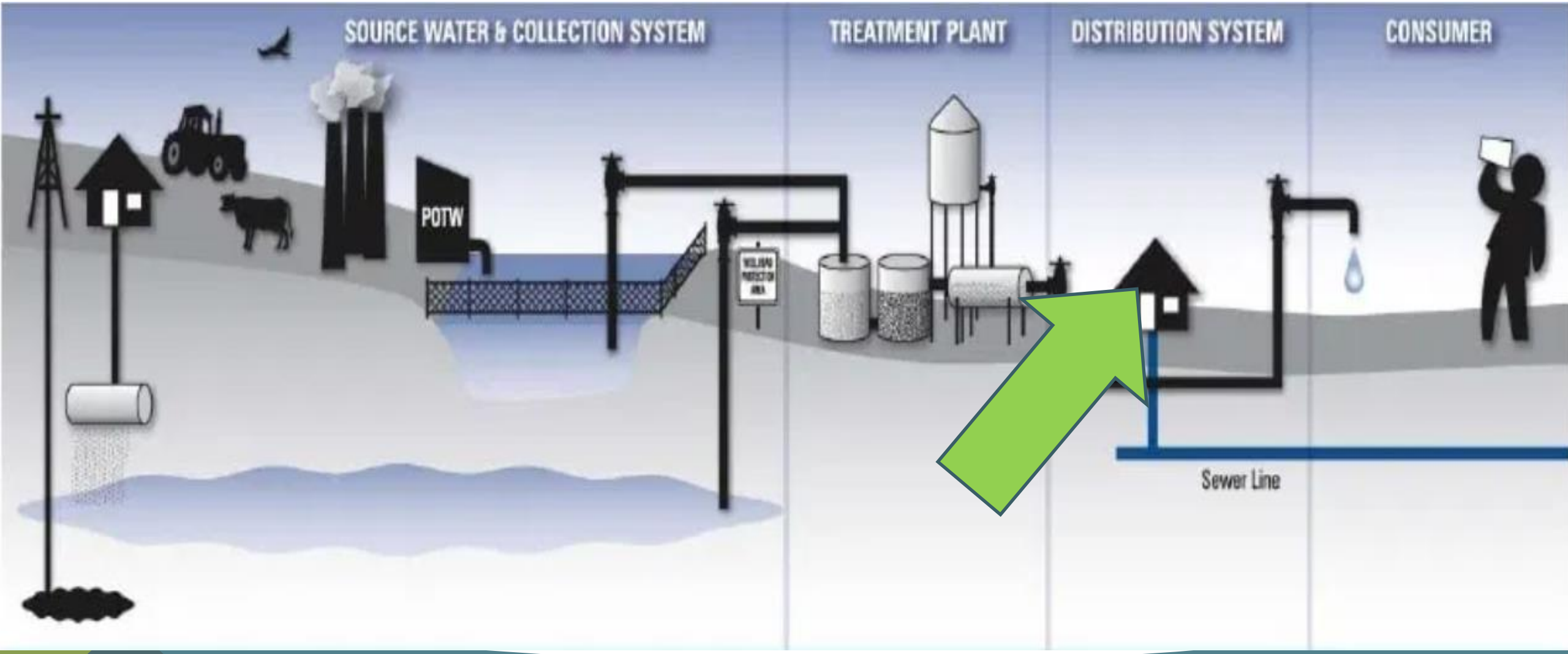
This poster identifies examples of

1. Surface and groundwater sources of drinking water (in blue),
2. Potential threats to those drinking water sources (in red), and
3. The multiple barriers that together protect our nation's public health (in green).
   - Risk Prevention Barrier
   - Risk Management Barrier
   - Risk Monitoring and Compliance Barrier
   - Individual Action Barrier

Safe Drinking Water Hotline – (800) 426-4791 Safewater Web Site – www.epa.gov/safewater

EPA
United States Environmental Protection Agency
EPA 816-H-02-003
January 2002

Multiple Barriers to Contamination



Outline

Residential

Basis Why do I have to consider Residential?

Burden What is expected of the Water Supply?

Regulation EGLE Oversight

Action What to do, Resources for help

SAFE DRINKING WATER ACT
Act 399 of 1976

325.1001a Legislative intent; water resources research institutes.

Sec. 1a. It is the intent of the legislature to provide adequate water resources research institutes and other facilities within the state of Michigan so that the state may assure the long-term health of its public water supplies and other vital natural resources.

Part 14

R 325.11403 Cross-connections prohibited.

Rule 1403. (1) A temporary or permanent unprotected cross connection between a public water supply system and any source, piping, or system that may contain nonpotable water or other substances is prohibited.

(2) Subrule (1) of this rule applies to all customer types, such as, industrial, commercial, institutional, governmental, and single and multi-unit residential.

(3) Piping configurations creating the potential for water from a public distribution system to flow through a private water main or customer site piping and back into the public system are prohibited. Areas of private water main served by two or more service connections, where flow through the private system can re-enter the public system shall

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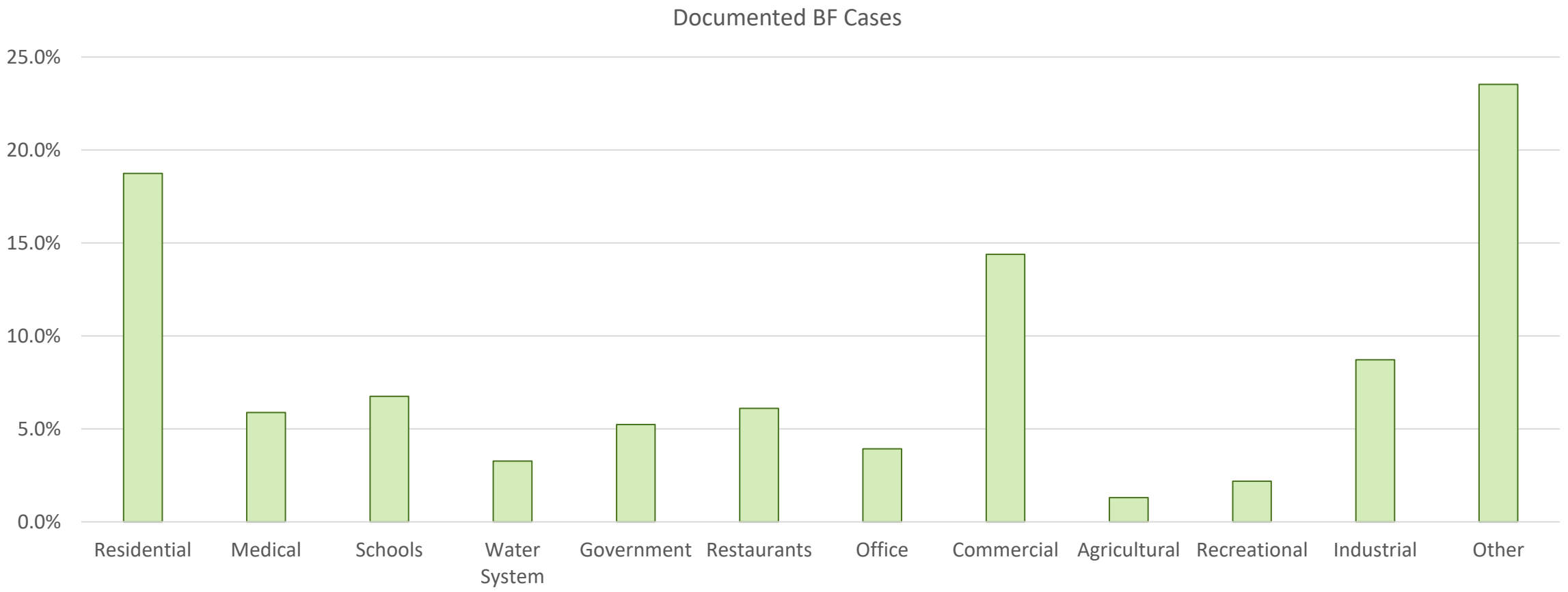
Known Backflow Incidents

- From 1981 to 1998, CDC documented 57 waterborne disease outbreaks related to cross-connections, resulting in 9,734 illnesses.
- EPA research from 1970 to 2001 found 459 incidents resulting in an estimated 12,0932 illnesses.

1970-2001 Incidents



EPA white paper, 2002

Common Sense

Residential

- Residential customers are the majority (80-95%)
- Most backflow incidents will be short lived and undetected
- High risks do exist in homes

Residential Backflow is a significant risk!!!!!!

Unpermitted work!

- Less oversight

Not Convinced?

Residential

October 1991 (Southgate, Michigan). Parasitic worms were found in the water at two homes after a malfunctioning lawn sprinkler coupled with a water main break sucked nematodes into the water system.

The nematodes first showed up in the evening of Oct. 1 after the backflow prevention system on the privately owned underground sprinkler malfunctioned. When the water pressure dropped, the vacuum in the system sucked some water from the sprinkler into the City water. A homeowner found the worms swimming around in his bathtub when he started filling the tub for his child. He said he was appalled to find the critters, as well as rust and other debris in his water. "The only reason I noticed it is because I have children and was giving my kid a bath. If you have a screen on your faucet or you were taking a shower, you wouldn't see it." The contractor who installed the sprinkler system didn't pull a city permit and used a "cheap" atmospheric vacuum breaker. When it malfunctioned, which was at the time of the water main break, the nematodes were pulled right in.

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Still Not Convinced?

Residential

A Commerce City family has been awarded nearly $1 million in damages after drinking water contaminated with raw sewage.	Denver, CO	Friday, October 26, 2012	Residential	http://denver.cbslocal.com/2012/10/26/commerce-city-family-awarded-nearly-1m-for-contaminated-water/
Bacteria known as coliform was discovered in the school's drinking water after a routine sample testing.	Malta, Idaho	Friday, September 28, 2012	School	http://minicassia-voice.com/featured/bacteria-found-in-raft-river-schools/
A cross-connection between an irrigation system and the culinary water system causes 13 families to get sick, some with *Giardia*.	Cedar Hills, Utah	Monday, September 17, 2012	Residential / Irrigation	http://www.abc4.com/content/news/top_stories/story/Tainted-water-made-Cedar-Hills-neighborhood-sick/19kK0Bikb0KnKCHGWSEcyQ.cspx
Private contractor mistakenly hooked up an incorrect pipe to another hook up.	Lake Perry, Miss.	Thursday, September 6, 2012	Residential	http://www.perryvillenews.com/latest_news/article_b8ca5e5a-fdb5-11e1-ba2f-0019bb30f31a.html
As many as 80 residents got sick over Memorial Day weekend, due to a nasty bacteria that got into the drinking water.	Boise, Idaho	Friday, June 8, 2012	Residential	http://boisestatepublicradio.org/post/boise-residents-sickened-bad-water-not-satisfied-companys-response
Andrea Mock reports a personal story of how her family home's water was contaminated.	Columbia, SC	Thursday, November 3, 2011	Residential / Irrigation	http://www.wltx.com/video/default.aspx?bctid=1257392162001

- AWWA M14
- Page 1 of 3, 2005 – 2012
- 8/20 (40%)

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Still…….not convinced?

Residential

BackflowCases.com

Officials: Water OK to use, drink in Neville Township

Officials in Neville Township, Allegheny County, have issued a warning to residents to not drink their water due to a backflow in the water system of approximately 2,000 gallons.

Officials said the content of the backflow was determined to originate from a fire suppression system.

The "Do Not Use Notice" has been lifted, but a "Do Not Drink Notice" is now in effect.

Bathing, hand washing, making ice, brushing teeth and washing dishes is not prohibited.

Water will be available at the Neville Island Fire Department on Grand Avenue.

Officials also said not to boil, freeze or filter the water since the content

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Archives

- 2020 (3)
- 2019 (7)
- 2018 (1)
- 2017 (5)
- 2015 (9)
- 2014 (2)
- 2013 (3)
- 2012 (10)
- 2011 (23)

What is Backflow?

- "Protecting the Safe Water Standard" - Watts Water

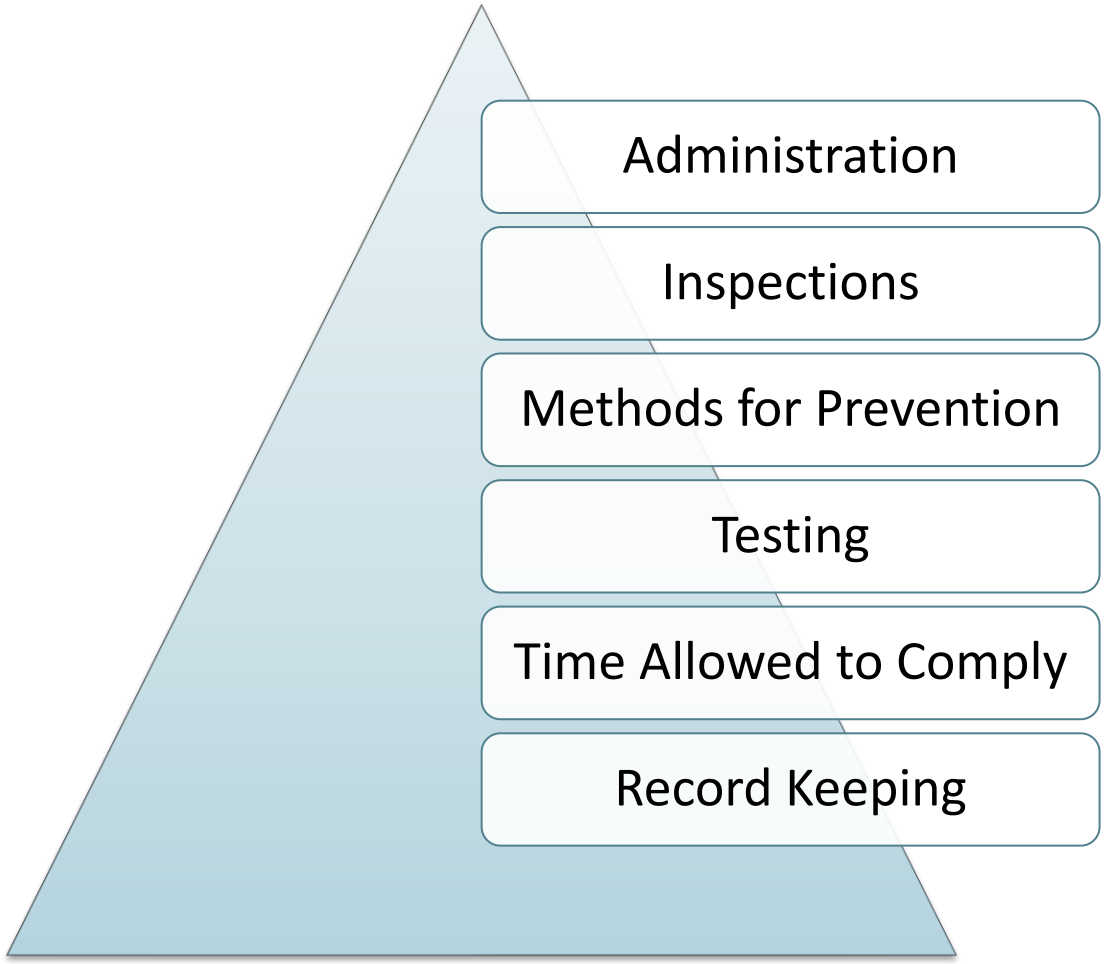
Cross Connection **Plan**

Residential

- Written outline of a **program** to prevent cross connections
- Plan: Approved by EGLE
- Reference for implementation

Cross Connection Program

Residential



Administration

Residential

"A complete description of the method of administering the program, including the designation of inspection and enforcement agency or agencies. The local authority for implementation of the program shall be indicated, preferably by ordinance."

-default: residential is administered the same as other customers

Inspections

Residential

- External VS Internal
- Frequency

MUST HAVE INSPECTION FORMS FOR BOTH!

State is not prescribing frequency BUT

– likely will not default to same frequency as commercial/industrial

Methods for Prevention

Residential

- Air Gap, RPZ vs DCVA vs PVB vs AVB

- Default; same as other customer classes

Testing

Residential

- Frequency (same as other classes)
- ASSE 5110 (same as other classes)
- Unique Challenges:
  - Irrigation contractors/repairs
  - DIY (unpermitted)
  - Unwilling participants (Cost)
  - Winterization

Compliance/Enforcement

Residential

- Unwilling participants …
- Consistency – detailed in written plan
- Ordinance
- Politics

Recourse?

-letters -fines -shutoffs

Record Keeping

Residential

- High Number of Accounts
- Organization
- Go Digital
- Future reference

EGLE Review - Sanitary Survey

- Standardized for Consistency
- More thorough
- Findings:
  - Recommendations
  - **Deficiencies**
  - **Significant** Deficiencies

FILE REVEW

1.	Is there an approved, up to date, Cross Connection Control Program (CCCP) on file?	☐Yes	☐No	☐NA	☐R	☐D	☐SD
2.	Is the CCCP comprehensive in protecting against cross connections and backflow conditions?	☐Yes	☐No	☐NA	☐R	☐D	☐SD
3.	Does the CCCP adequately address all count classes? *(including residential)*	☐Yes	☐No	☐NA	☐R	☐D	☐SD
4.	Is the annual Cross Connection report submitted on time and complete?	☐Yes	☐No	☐NA	☐R	☐D	☐SD
5.	Is the supply meeting CCCP expectations for inspections and testing?	☐Yes	☐No	☐NA	☐R	☐D	☐SD

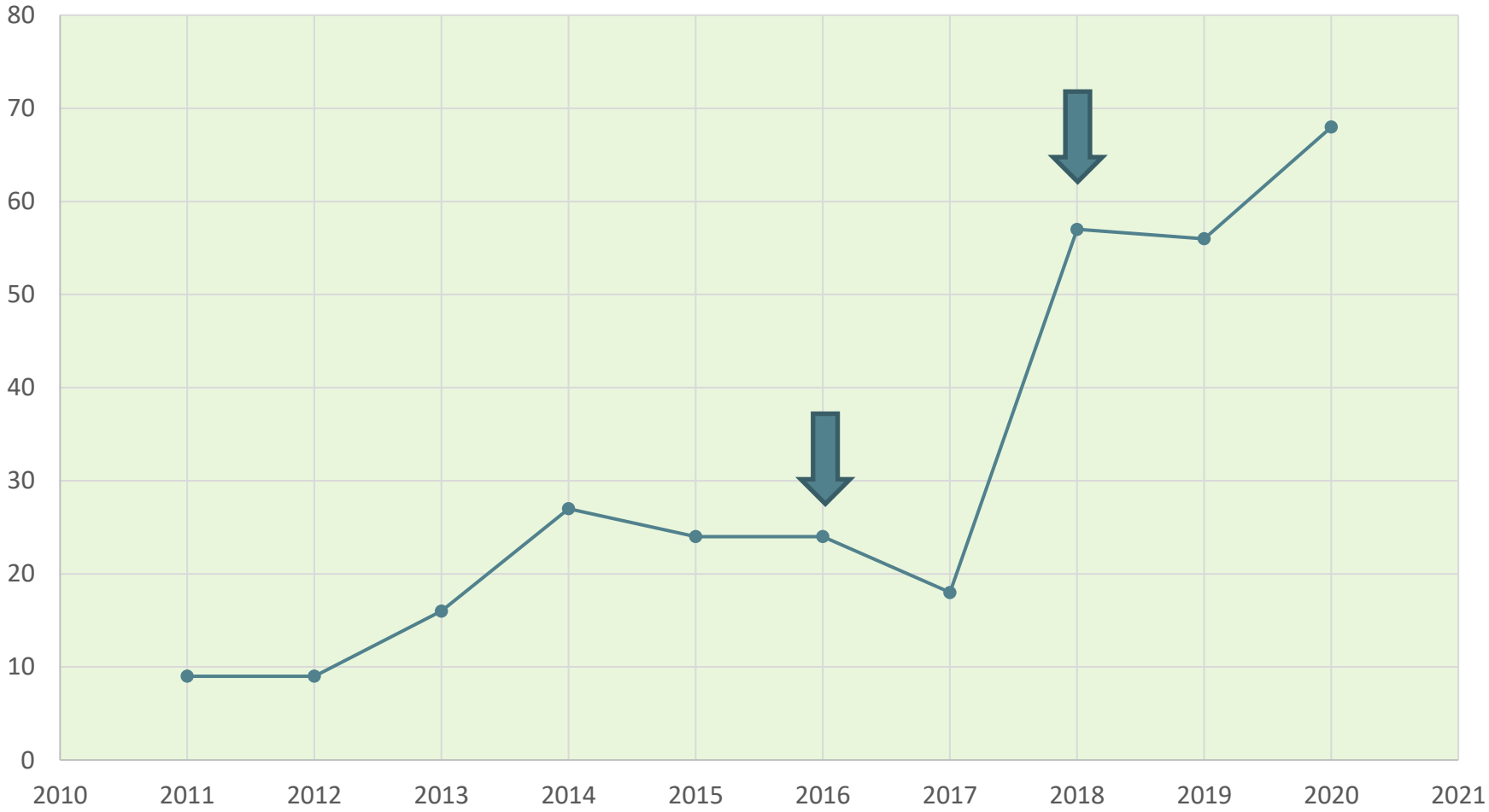
Comments:

INTERVIEW

1.	Are there any known backflow incidents in the water system since the last sanitary survey?	☐Yes	☐No	☐NA	☐R	☐D	☐SD
2.	Has the supply ensured that there are no cross connections present at facilities they own?	☐Yes	☐No	☐NA	☐R	☐D	☐SD
3.	Does the supply test devices at all the facilities they own?	☐Yes	☐No	☐NA	☐R	☐D	☐SD
4.	Is the public-owned portion of the distribution system free of known cross connections? *(Pump station service water, submerged air/vac valves, direct piped overflows…)*	☐Yes	☐No	☐NA	☐R	☐D	☐SD
5.	Does the supply adequately control hydrant use?	☐Yes	☐No	☐NA	☐R	☐D	☐SD
6.	When containment is used as a backflow prevention strategy, does the supply notify customers about backflow risks within the building plumbing?	☐Yes	☐No	☐NA	☐R	☐D	☐SD
7.	Does the supply maintain adequate records of inspections?	☐Yes	☐No	☐NA	☐R	☐D	☐SD
8.	Does the supply maintain adequate records of backflow preventer tests?	☐Yes	☐No	☐NA	☐R	☐D	☐SD
9.	Is the supply conducting adequate inspections of all account classes? *(including residential)*	☐Yes	☐No	☐NA	☐R	☐D	☐SD
10.	Is adequate backflow preventer testing being implemented in all account classes? *(including residential)*	☐Yes	☐No	☐NA	☐R	☐D	☐SD
11.	Is the supply only accepting assembly testing results from individuals holding a current ASSE 5110 certification?	☐Yes	☐No	☐NA	☐R	☐D	☐SD
12.	Is the supply actively enforcing required corrective actions? *(inspection findings and assembly testing due dates)*	☐Yes	☐No	☐NA	☐R	☐D	☐SD
13.	Is the cross connection program implemented by staff who have received formal training in identifying cross connections and understanding backflow prevention strategies?	☐Yes	☐No	☐NA	☐R	☐D	☐SD
14.	Does the supply coordinate with the local plumbing official to ensure new installations meet cross connection principles?	☐Yes	☐No	☐NA	☐R	☐D	☐SD
15.	Does the supply provide formal education on the risks of backflow for its residential customers?	☐Yes	☐No	☐NA	☐R	☐D	☐SD

Comments:

EGLE deficiencies for XC



Sanitary Survey

Residential

Does the system address all account classes? (including residential)

Is the supply conducting adequate inspections of all account classes? *(including residential)*

Is adequate backflow preventer testing being implemented in all account classes? *(including residential)*

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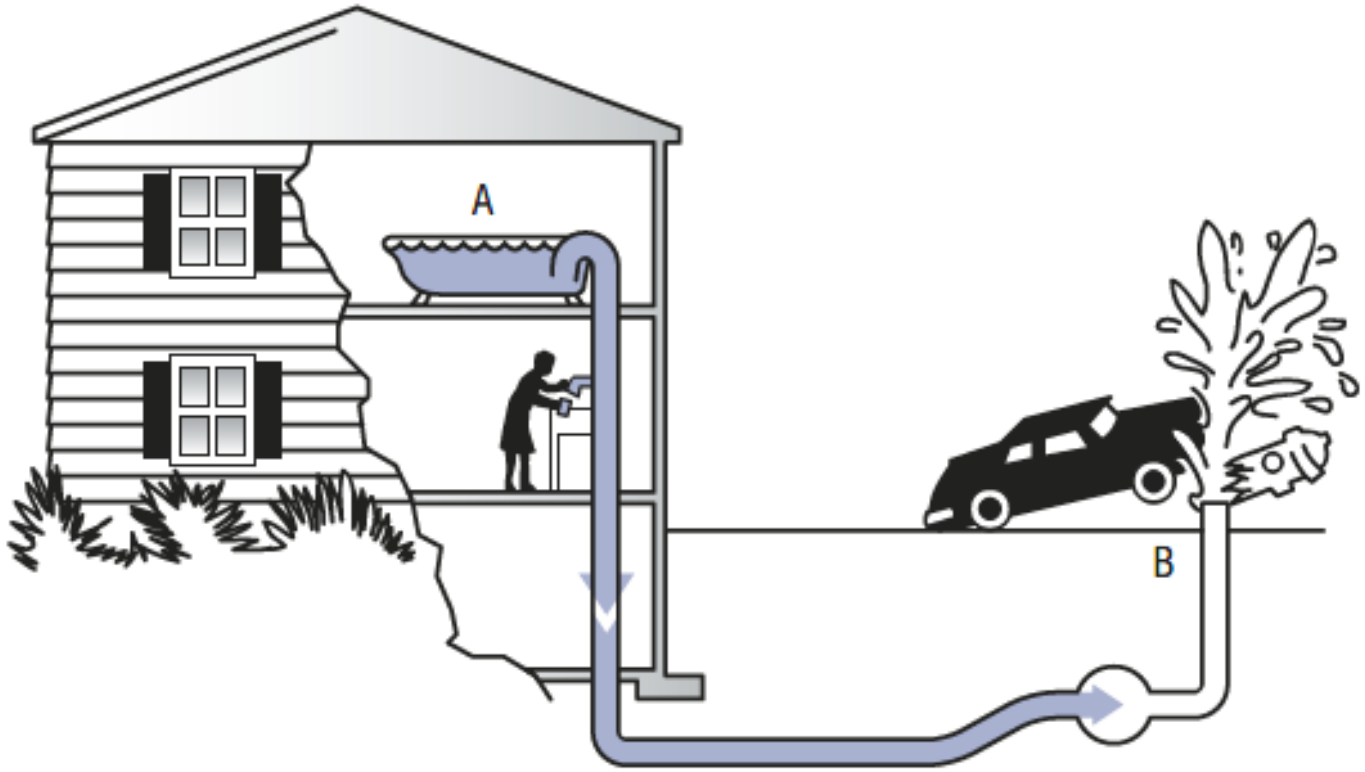
Backflow

Residential

Water systems are designed to bring water to your home.

When things go wrong, the system can flow backwards!



Health Risk

Residential

- Unprotected cross connections may allow contaminants into your plumbing during a backflow.
- Severe backflow can also affect the surrounding areas, or neighbors.

<u>Examples:</u>

Fertilizers	Bugs
Antifreeze	Bacteria
Cleaning Chemicals	Sewage

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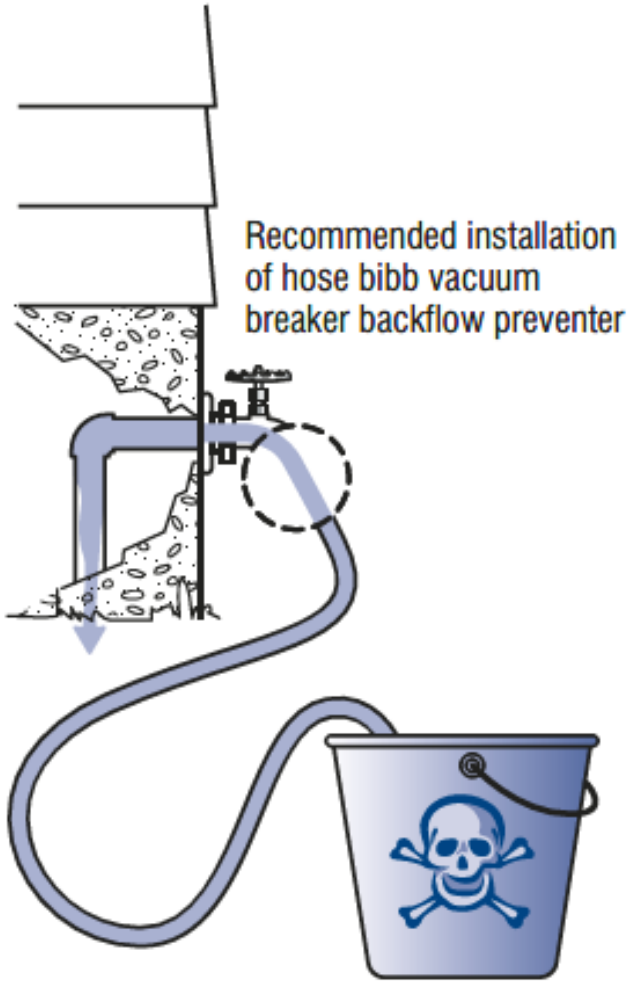
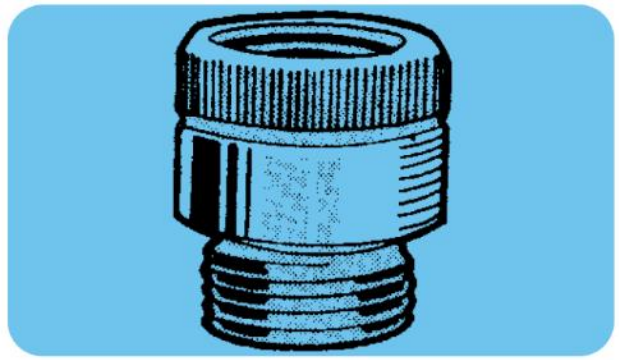
The Risk: Your Hose

Residential



The Fix: HBVB



- A hose bibb vacuum breaker (hbvb) will break the siphon during a backflow, protecting your health

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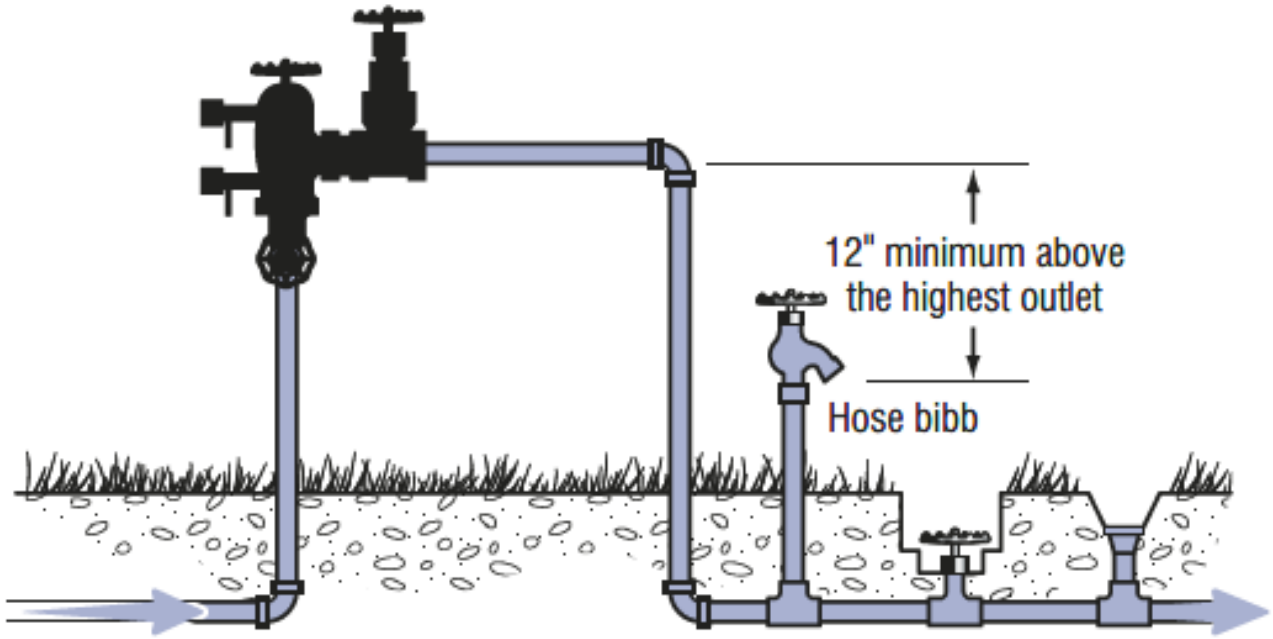
HBVB Considerations

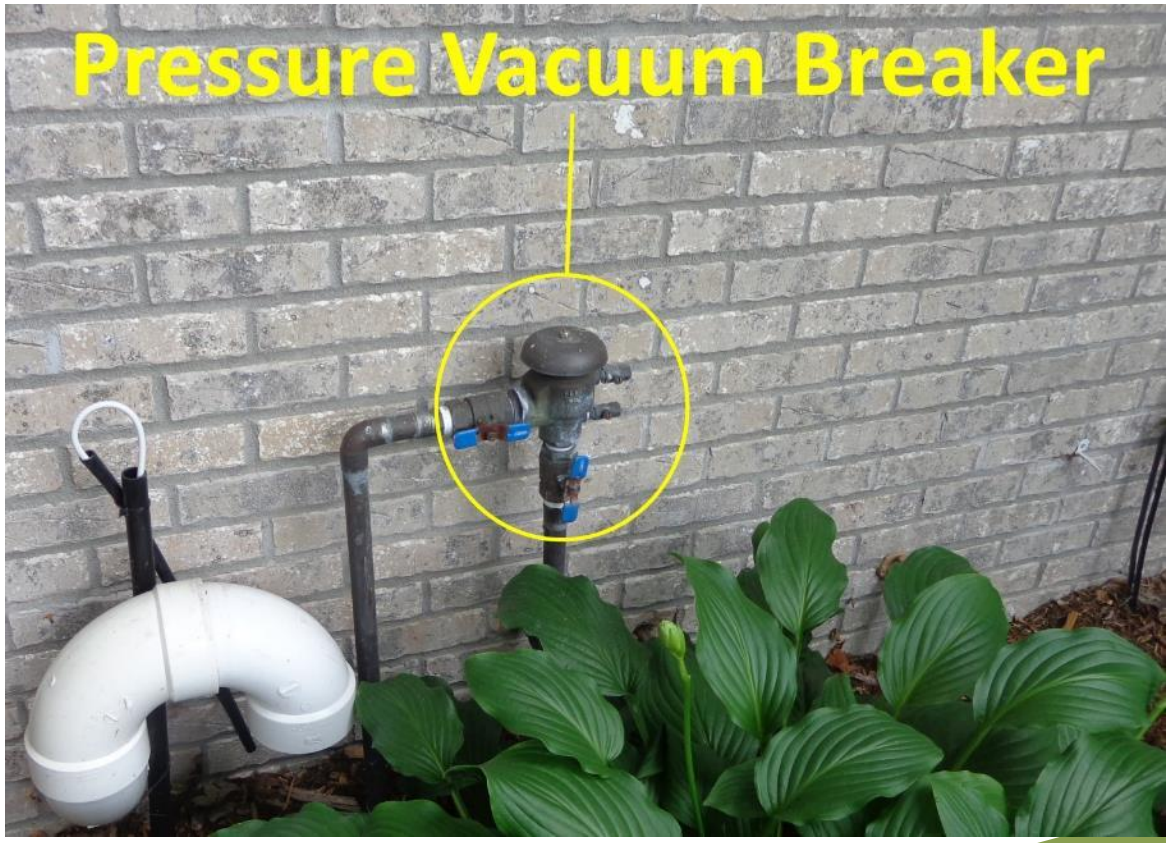
Residential

- Freeze proof?
- Tamper proof?
- What is downstream?
  - valves (i.e. hose)?
  - End sprayers/fertilizer

The Risk: Your Lawn



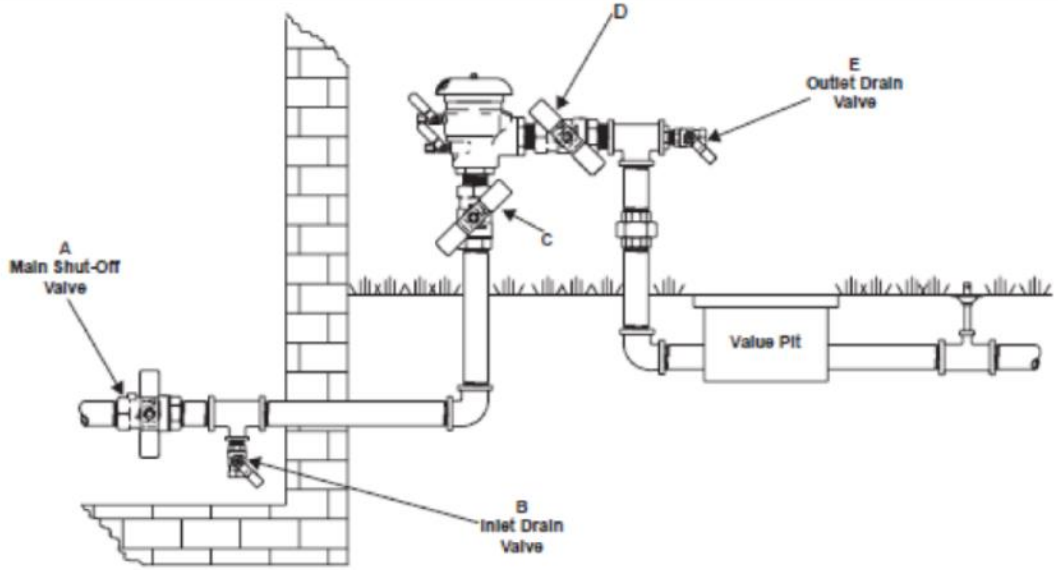
The Fix:

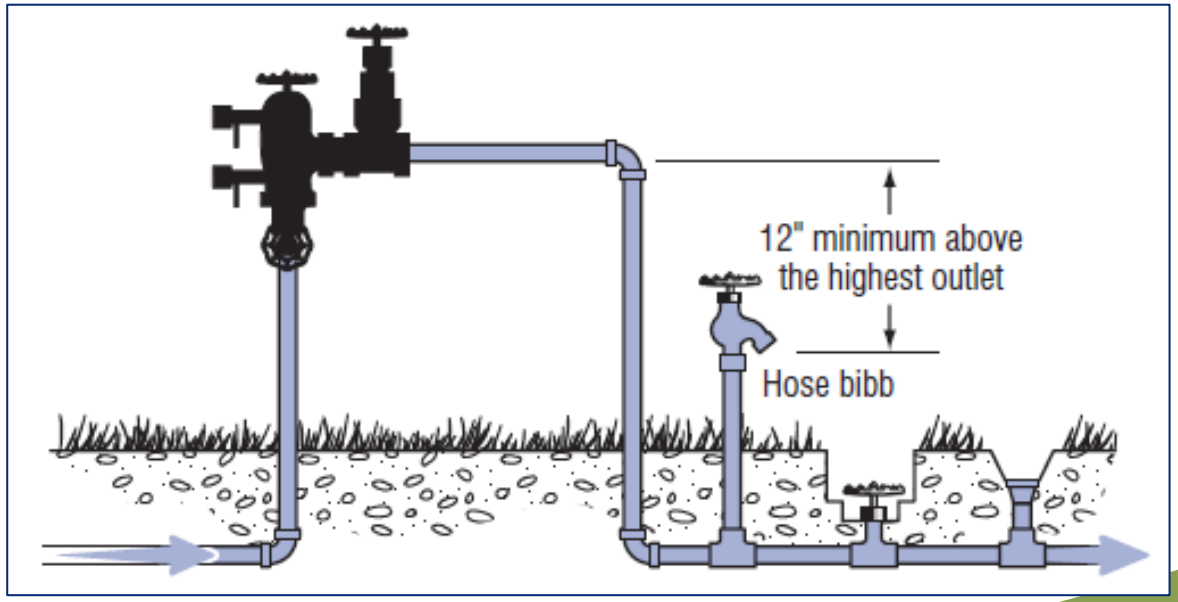


Irrigation Notes

FEBCO
An SPX Process Equipment Operation

Pressure Vacuum Breaker
Draining Procedure for Freeze Protection





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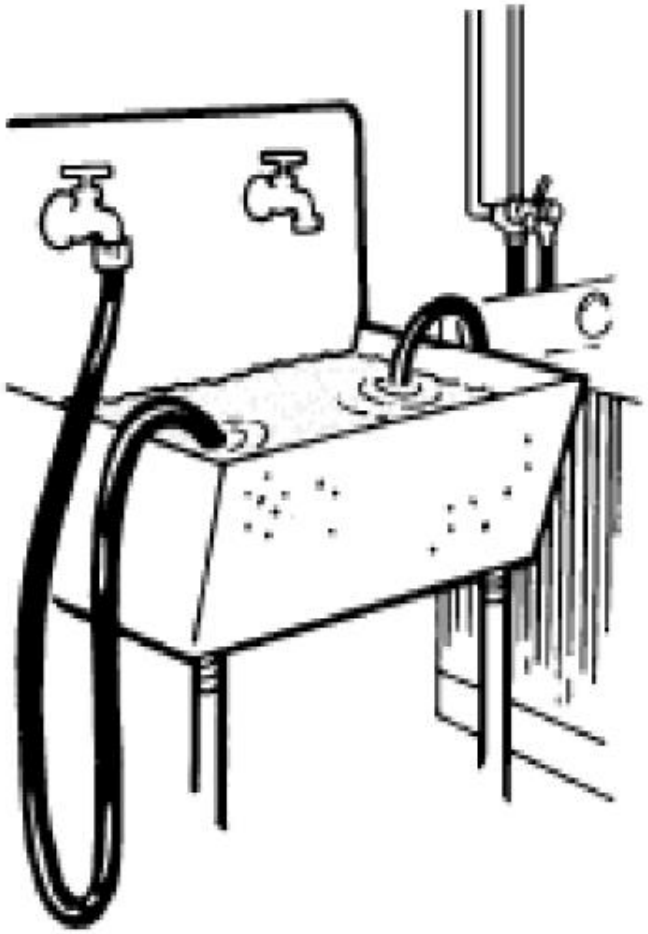
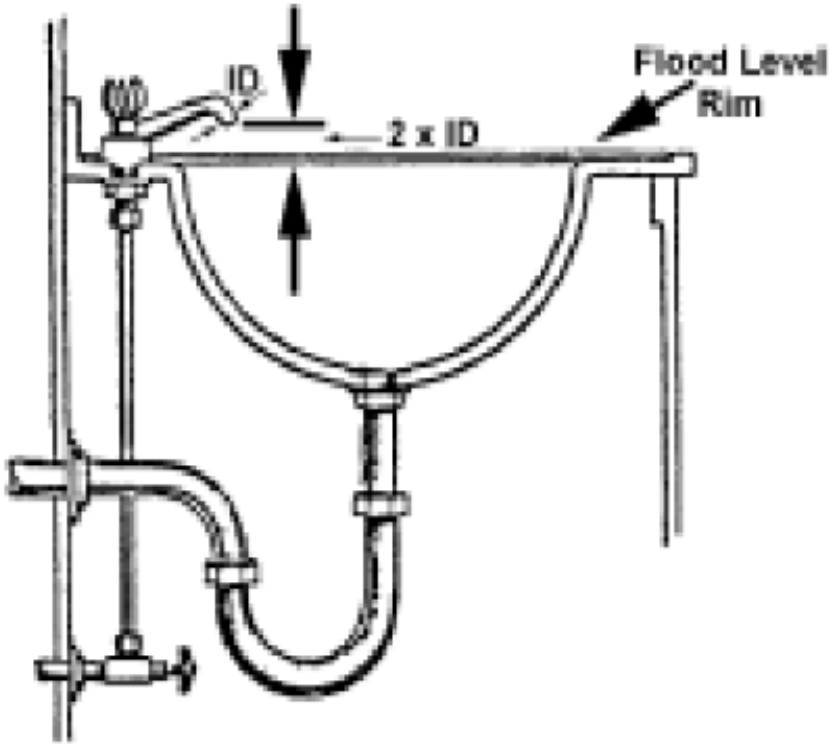
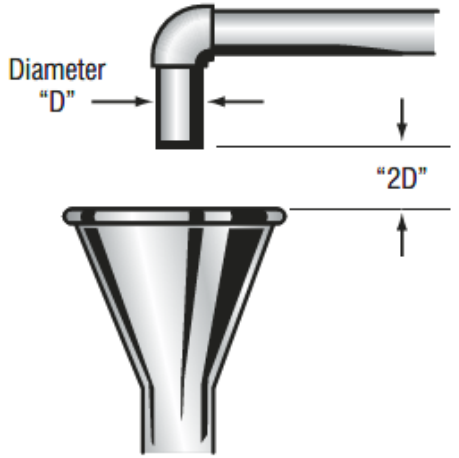
The Risk: Flooded Sink



The Fix: Air Gap





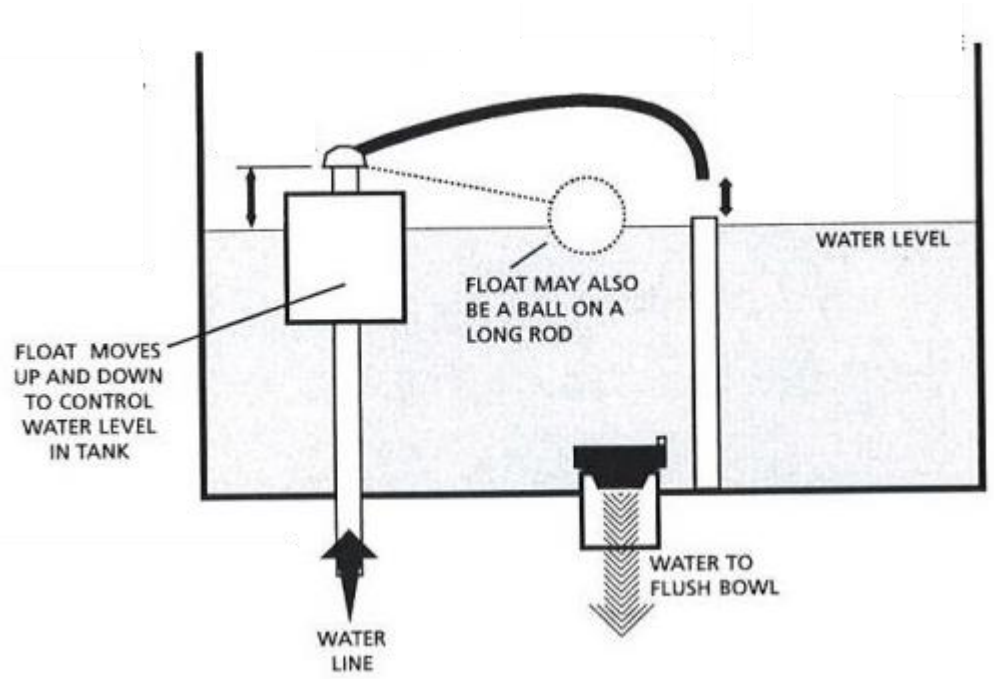
Sink Considerations

Residential

- Flood rim – no overflow
- Sprayers

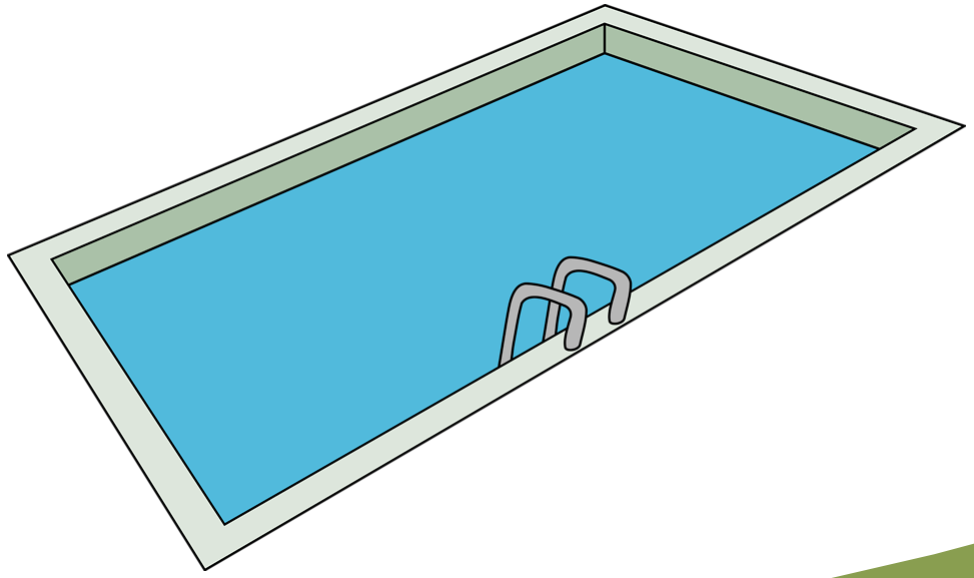
The Risk: Your Toilet

The Fix: Anti-siphon Fill Valve



Other Risks

- Softeners
- Water assisted Sump Pumps
- Boilers w/ chemical treatment
- Pools/Jacuzzi
- Household Appliances



Plumbing Code Overlap

R 325.11402 Compliance with regulations and local codes.

Rule 1402. A connection with a public water supply system shall comply with existing laws, ordinances, codes, and rules including:

(a) All sections of the Michigan plumbing code or the Michigan residential code pertaining to backflow and cross connection control. The codes allow for existing plumbing systems to stay as currently installed, providing they were installed properly according to the code in effect at the time of installation and they do not currently present a safety hazard.

(b) Local ordinances or rules providing acceptable protection against cross connections.

Other Resources

DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

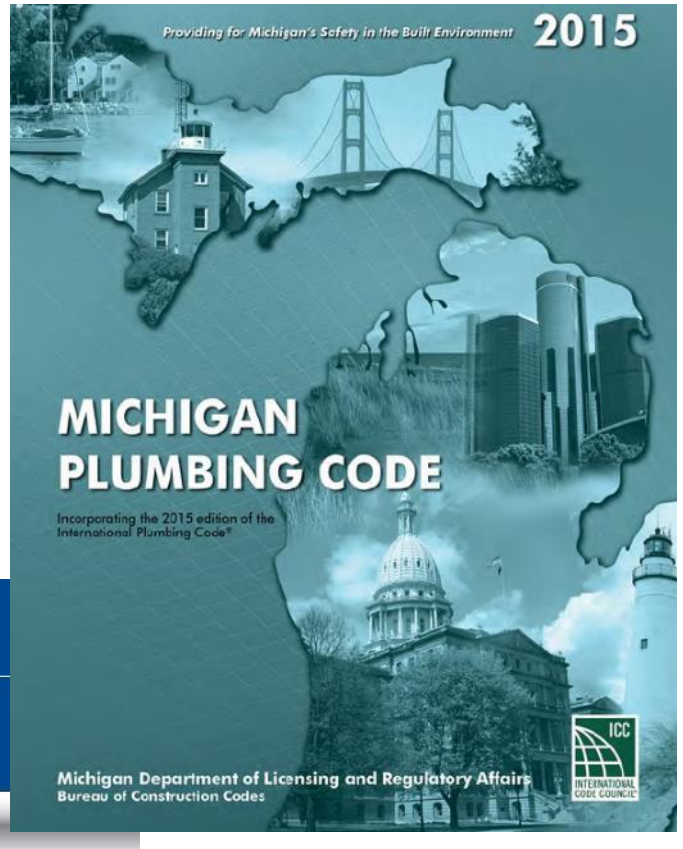
DRINKING WATER AND ENVIRONMENTAL HEALTH DIVISION

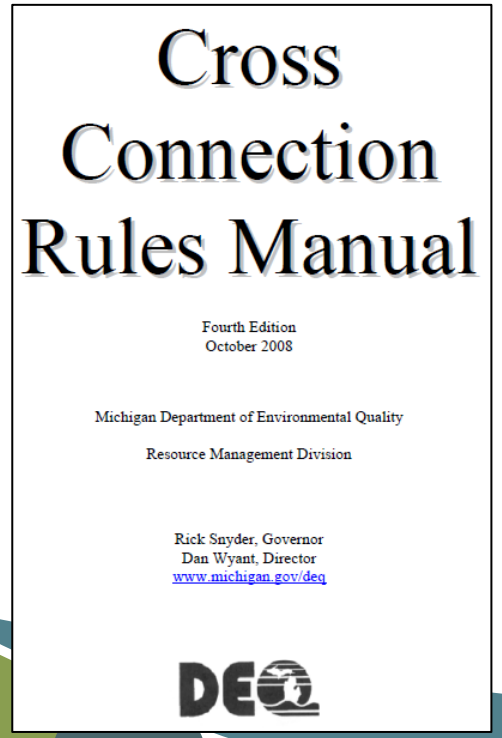
SUPPLYING WATER TO THE PUBLIC

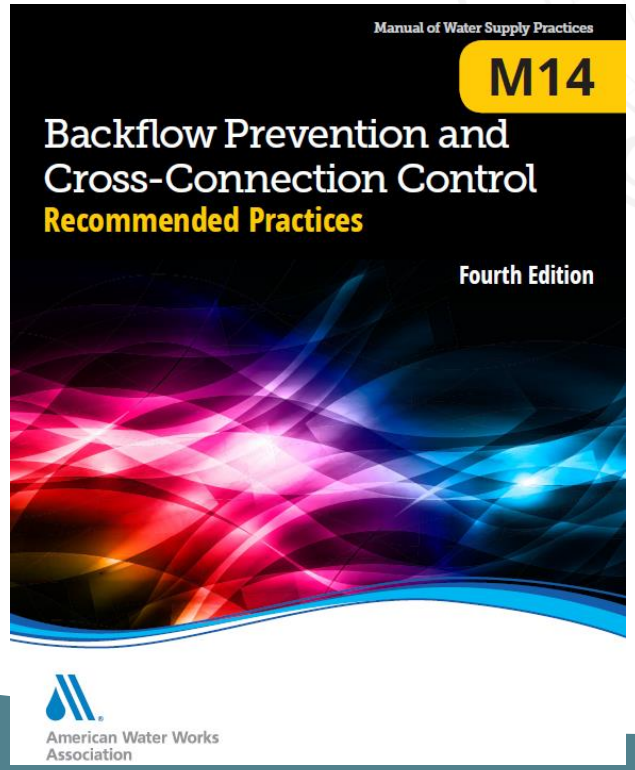
PART 14. CROSS-CONNECTIONS

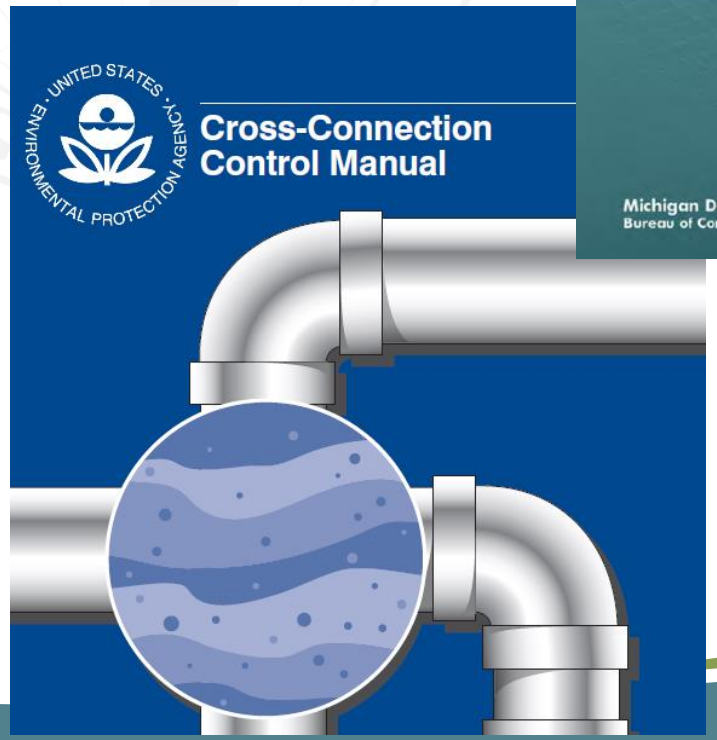
ASSE Guidelines for
Cross-Connection Control Certification

- Backflow Prevention Assembly Testers
- Backflow Prevention Assembly Repairers
- Cross-Connection Control Surveyors
- Fire Sprinkler System Cross-Connection Control Testers
- Backflow Prevention Program Administrators (Specialists)









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Go Deeper

- Fire Suppression Industry
- Irrigation Industry
- Chemical Dispensers & Industrial Cleaning
- Watts, Febco, Zurn, Apollo

Salespitch: Protect Your Health

Residential

- Cooperate with water system professionals
- Request an inspection
- Test backflow preventers by qualified professionals

These steps protect the health of the Homeowner!

Salespitch: Backflow and Leaks

Residential

- Lack of plumbing system maintenance can:
  - Cause leaks (higher water bill), AND
  - Increase risk of backflow

  Examples:
  - Malfunctioning toilet fill valve (running toilet)
  - Malfunctioning HBPVB or PVB may discharge water

  Not only are leaks expensive, they can be dangerous!

Tips for Success

- Public Education
  - Website
  - Events
- Use Customer Survey/Questionnaire
- Customer Service: conversations
- Consistency

Is my Residential Program in Compliance?

1. Does written plan cover residential and approved by EGLE?
2. Do you have record keeping and reporting system?
3. Are you actively inspecting residential customers?
4. Are you requiring tests on backflow preventers in residences?
5. Is the program being actively enforced?
6. Do you have a strategy for education of residences?

Residential Cross Connection Program

Questions?

EGLE - Community Water Supply (michigan.gov)

Scott Schmidt- EGLE OTCU Senior Environmental Quality Analyst
Bob Weir, E.I.T. - EGLE District 72 Engineer