Lead Contamination in Drinking Water

An overview on Lead exposure, and an update on the LCR

Sean Stratton, MPH, CSP

Doctoral Student in Public Health

RUTGERS
Environmental and Occupational Health Sciences Institute | EOHSI

NIEHS CEED Center for Environmental Exposures and Disease

RUTGERS
Center for Environmental Exposures and Disease

Lead Ban Timeline

1978
Lead paint banned for residential use

1986
Lead pipes were "banned". Pipes were still allowed to contain 8% lead by weight

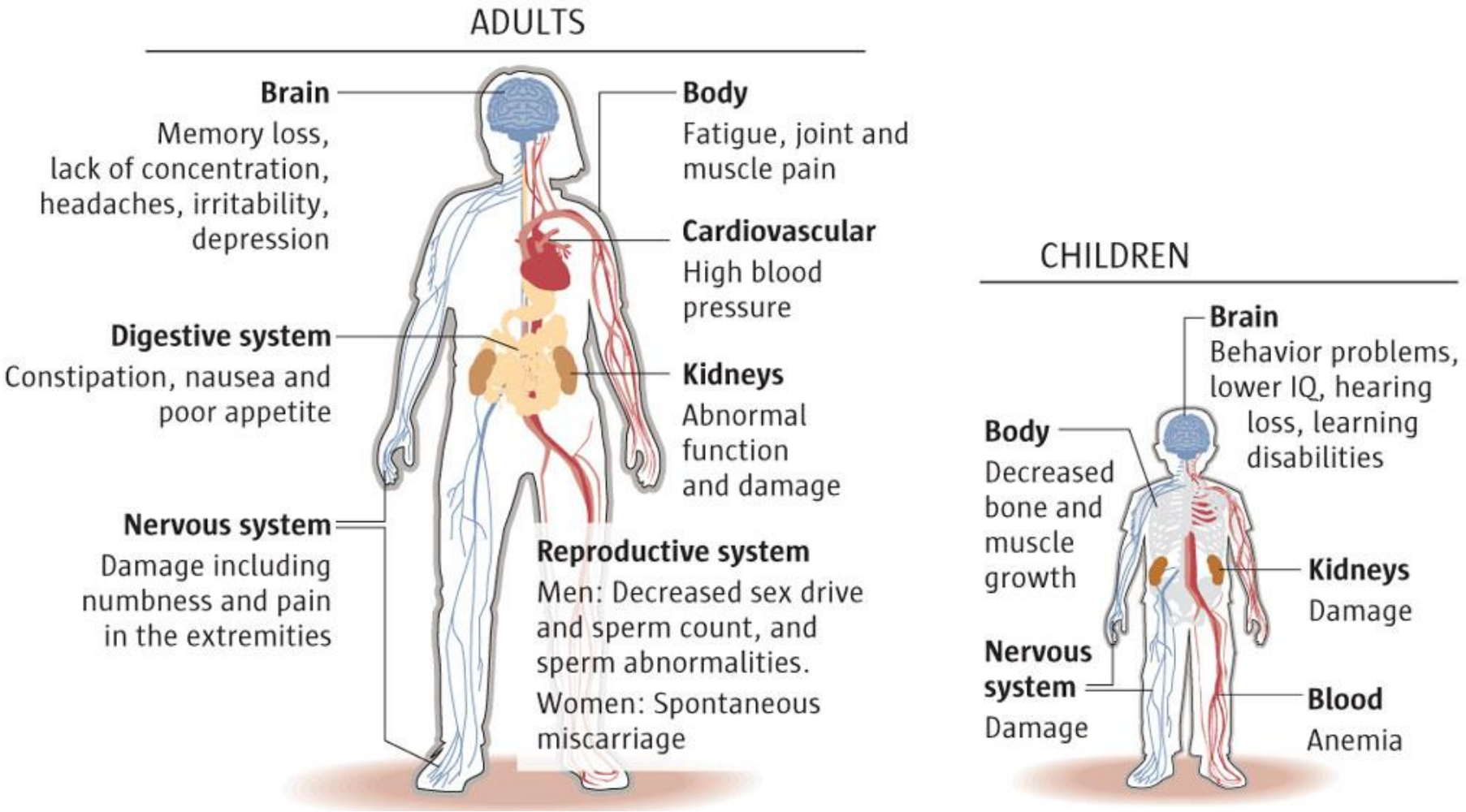
1986
Lead solder reduced from 50% lead by weight to 0.2%.

1996
Leaded gasoline banned

2011
Plumbing products reduced from 8% lead by weight to a weighted average of 0.25%

Why is Lead a Problem?

Health Effects of Lead

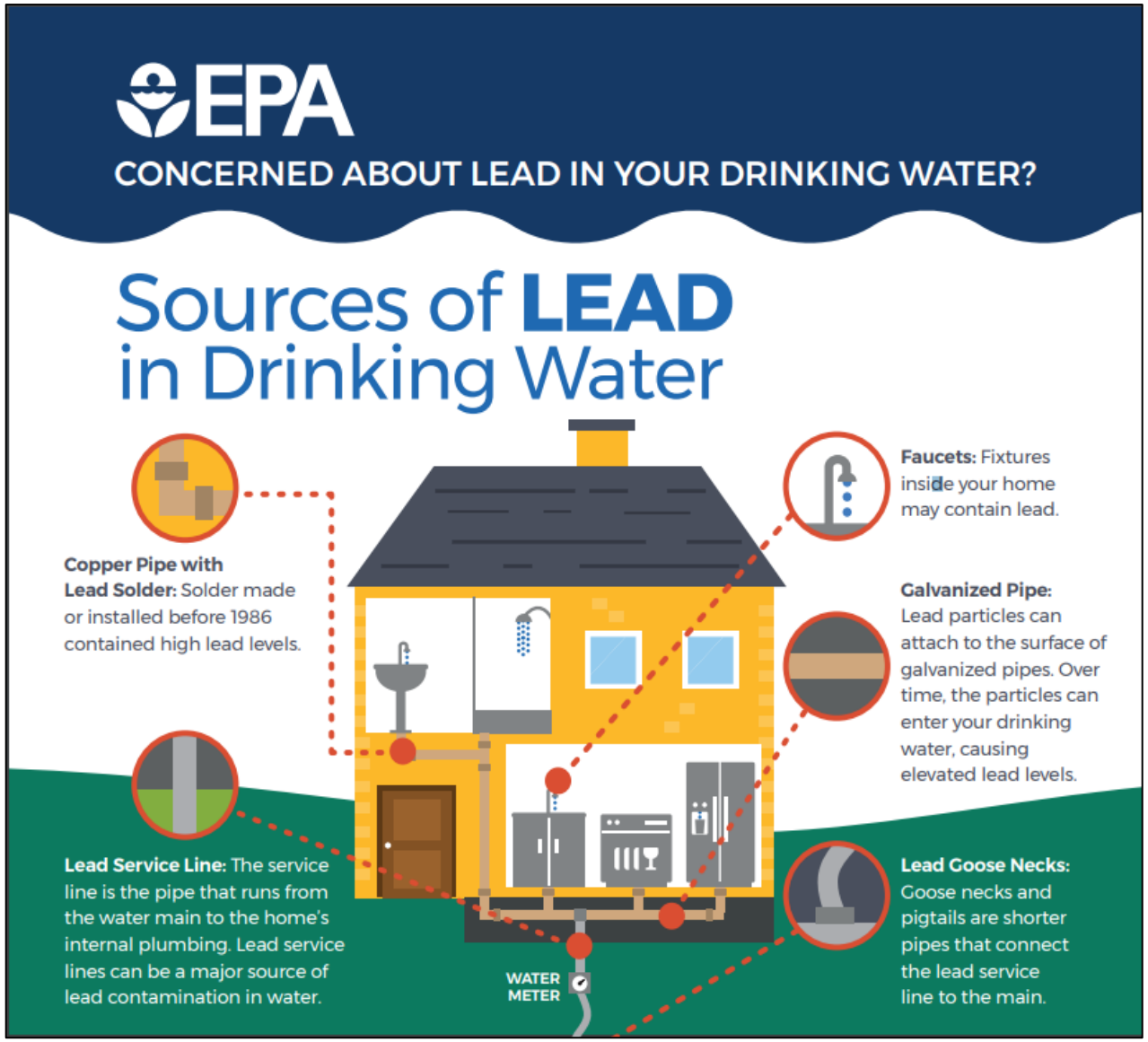


Major Sources of Lead in Homes

Some Other Potential Sources of Lead

- Bullets
- Fishing sinkers
- Cosmetics from other countries
- Folk medicines
- Spices bought from other countries such as turmeric and paprika
- Arts and crafts supplies
- Workplaces and hobbies
- Children’s toys and jewelry
- Ceramics and pottery

What are the Sources of Lead in Water?



EPA, 2020

The 1991 US EPA's Lead and Copper Rule (LCR)

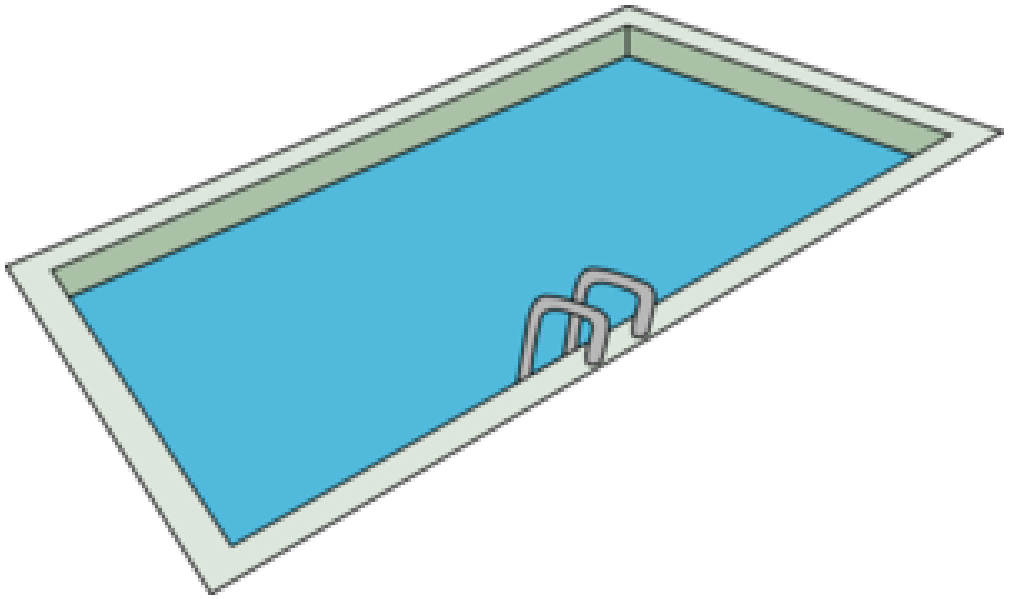
- Sets an Action Level of 15 parts per billion (ppb)
- If 10% of homes tested are > 15 ppb, the water system must take action to fix it through public notification, corrosion control modifications, and LSL replacement
- The EPA created this rule, but the New Jersey Department of Environmental Protection (NJDEP) enforces it

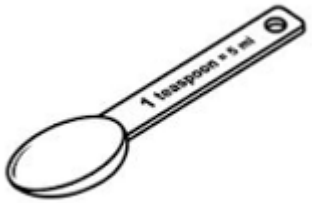
There is NO Safe Level for Lead*

* The *American Academy of Pediatrics* recommends that drinking water should not exceed lead concentrations of more than 1 part per billion (ppb) for child consumption.

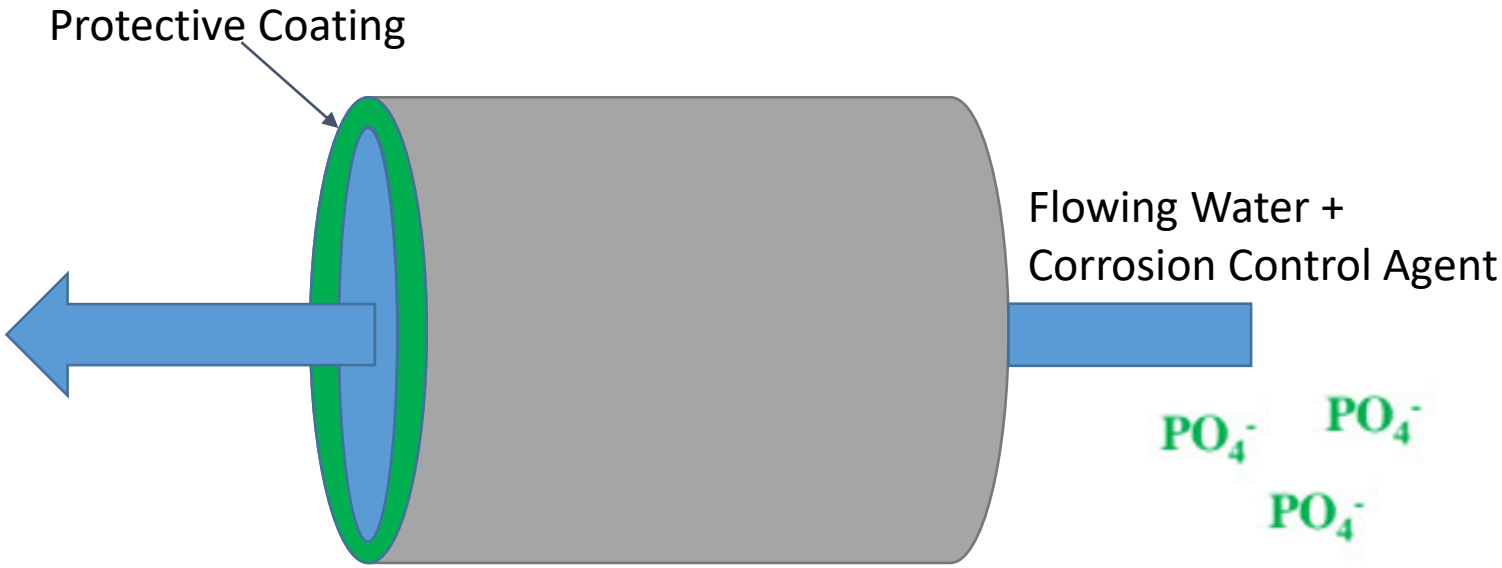
What is a Part per Billion?

1 part per billion is approximately 1 teaspoon of water from an Olympic Swimming Pool (660,000 Gallons)





What is Corrosion Control?



How is the Lead and Copper Rule Changing?

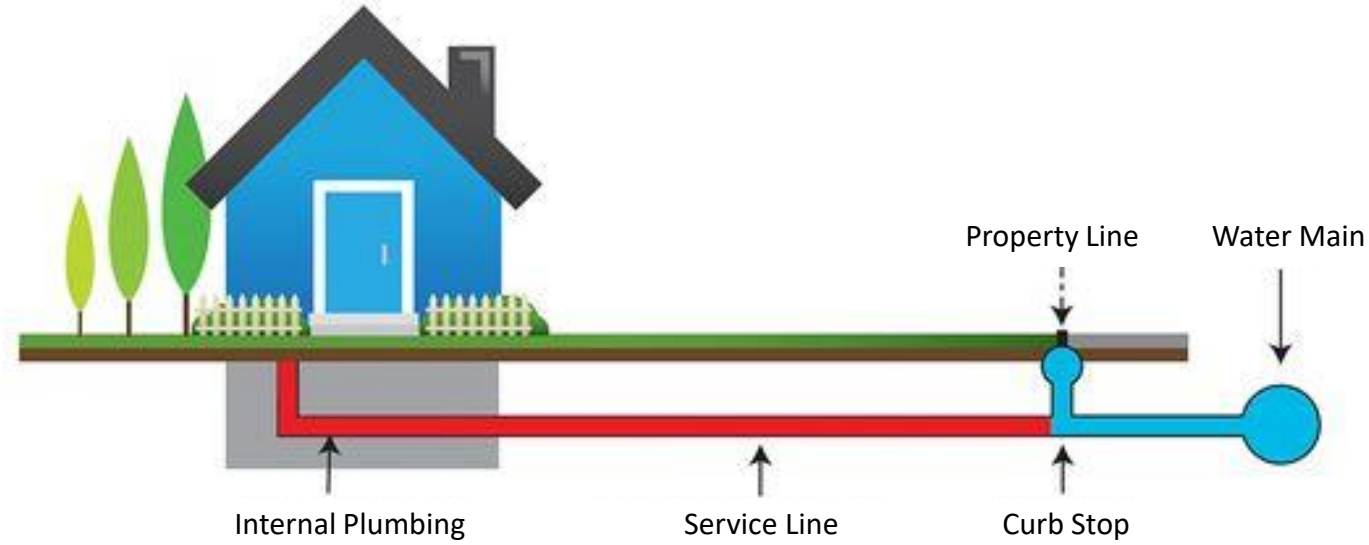
Lead and Copper Rule Revisions go into effect
October 16, 2024

Introduction of a “Trigger Level” at 10 parts per billion (ppb)

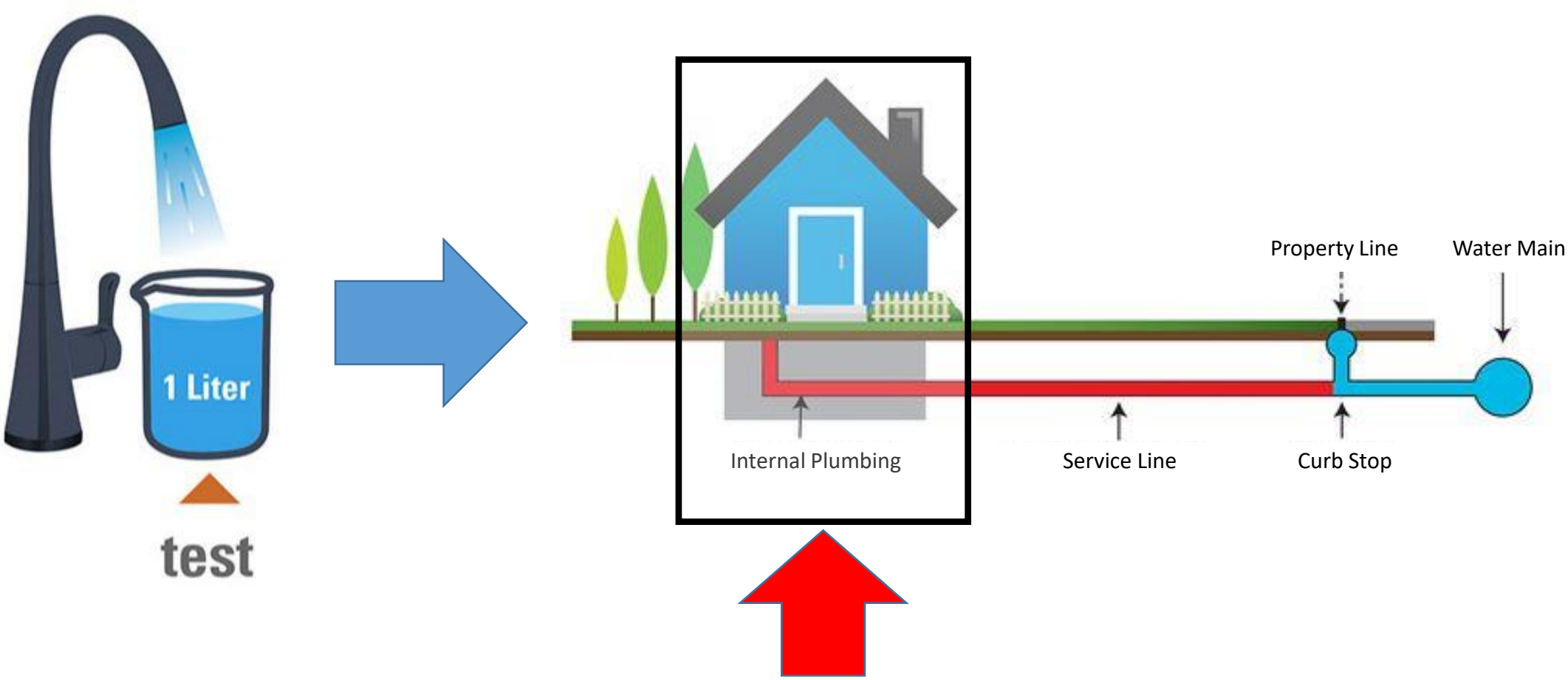
- If 10% of homes exceed 10 ppb:
  - Water systems must provide public notification
  - Must begin “goal-based” lead service line replacement until the water utility measures below the “Trigger Level”
- Action Level of 15 ppb remains the same
- “Goal-based” is whatever the Water Utility and the State agree upon

Where we Measure Lead Matters

How we sample can bias our results

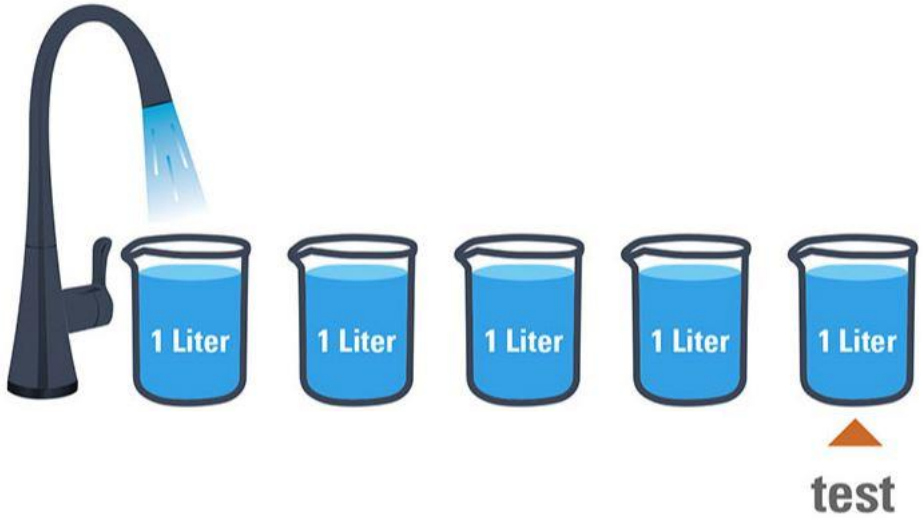


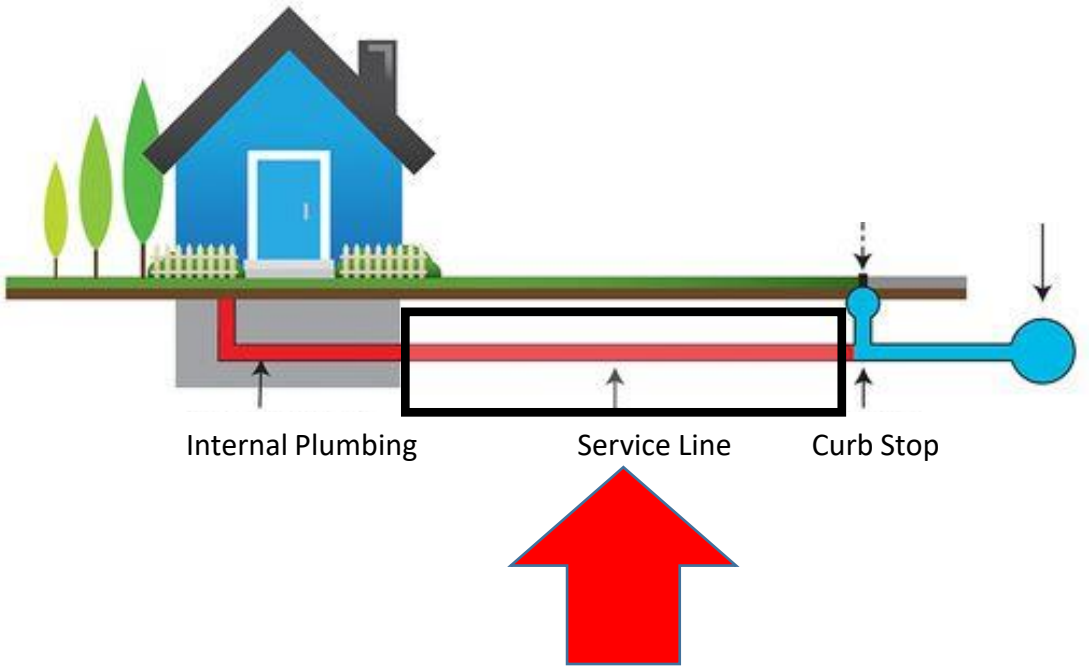
Current Sampling Method



Captures Water Stagnant within the Home

New Sampling Method for Homes with a Lead Service Line (LSL)





Potentially Captures Water Stagnant within the LSL

Action Level Exceedance

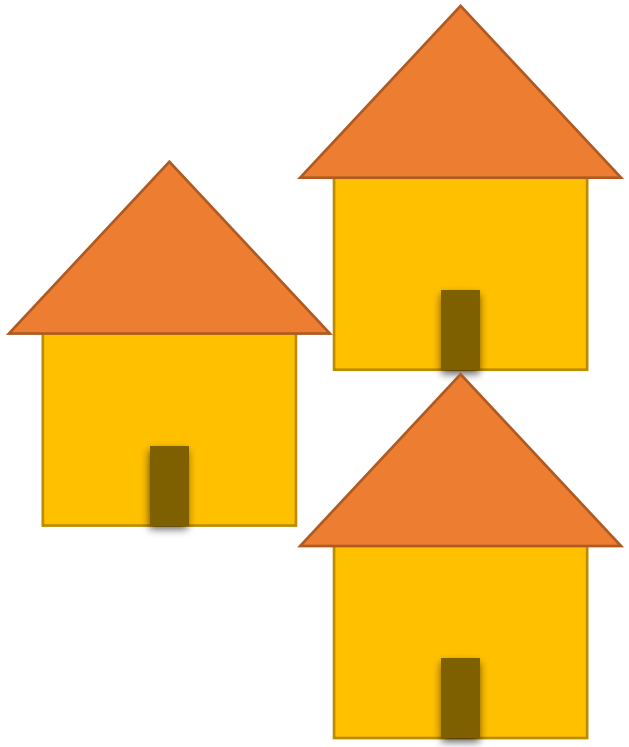
OLD LCR

- Implement better Corrosion Control
- Provide Public Notifications
- Replace Lead Service lines within system at a rate of **7% per year** or until the system tests beneath the action level

NEW LCR

- Implement better Corrosion Control
- Provide Public Notifications
- Replace Lead Service lines within system at a rate of **3% per year** or until the system tests beneath the action level

A Hypothetical Town with Lead Service Lines



7% replacement per year

About 14 years
to replace all

3% replacement per year

About 33 years
to replace all

After Lead Service Line Replacement

OLD LCR

- No requirements post replacement

NEW LCR

- Water Provider must provide a pitcher filter with 3 months of cartridges after replacement
- Water Provider must collect a follow up sample between 3 and 6 months after replacement

Water Testing in Schools and Child-Care Facilities

OLD LCR

- No requirements

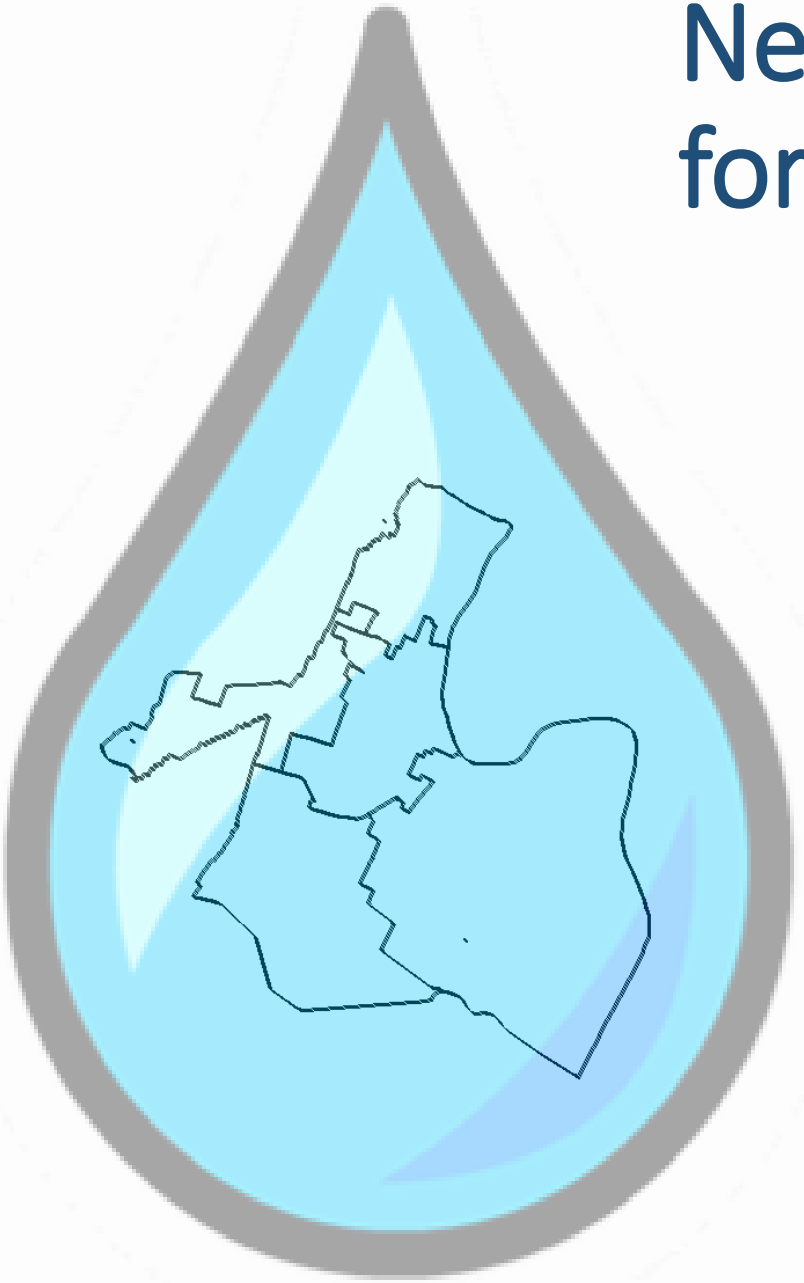
NEW LCR

- 5 samples per school and 2 samples per child-care facility once every 5 years

What else can I do to Protect My Family?

- Use a filter that is approved to remove lead
- Use only filtered **cold water** for cooking & preparing baby formula
  - Boiling water will not remove lead!
- Regularly remove and rinse the aerator/faucet screen
- Run the water for at least 5 minutes after long periods of stagnation

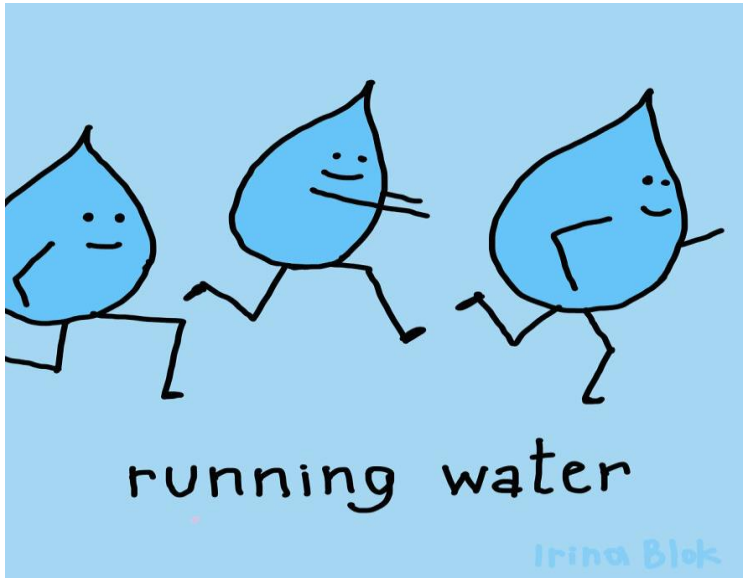
Newark Update, an Example for the Nation



- In 30 months, Newark replaced more than 22,000 Lead Service Lines at a cost of about $5,000 per LSL
- Implemented new Corrosion Control within the Pequannock Water System in 2019
- Aggressive approach has brought Newark back into LCR compliance
- **Demonstrated rapid LSL replacement is feasible**

More Questions?

Contact me!



SAS536@sph.rutgers.edu