



**Lead in Drinking  
Water – Moving  
Beyond Regulation to  
Protect Public Health**

**AQUA**<sup>SM</sup>

**AWWA Meeting  
March 16, 2017**

# History of Lead Use

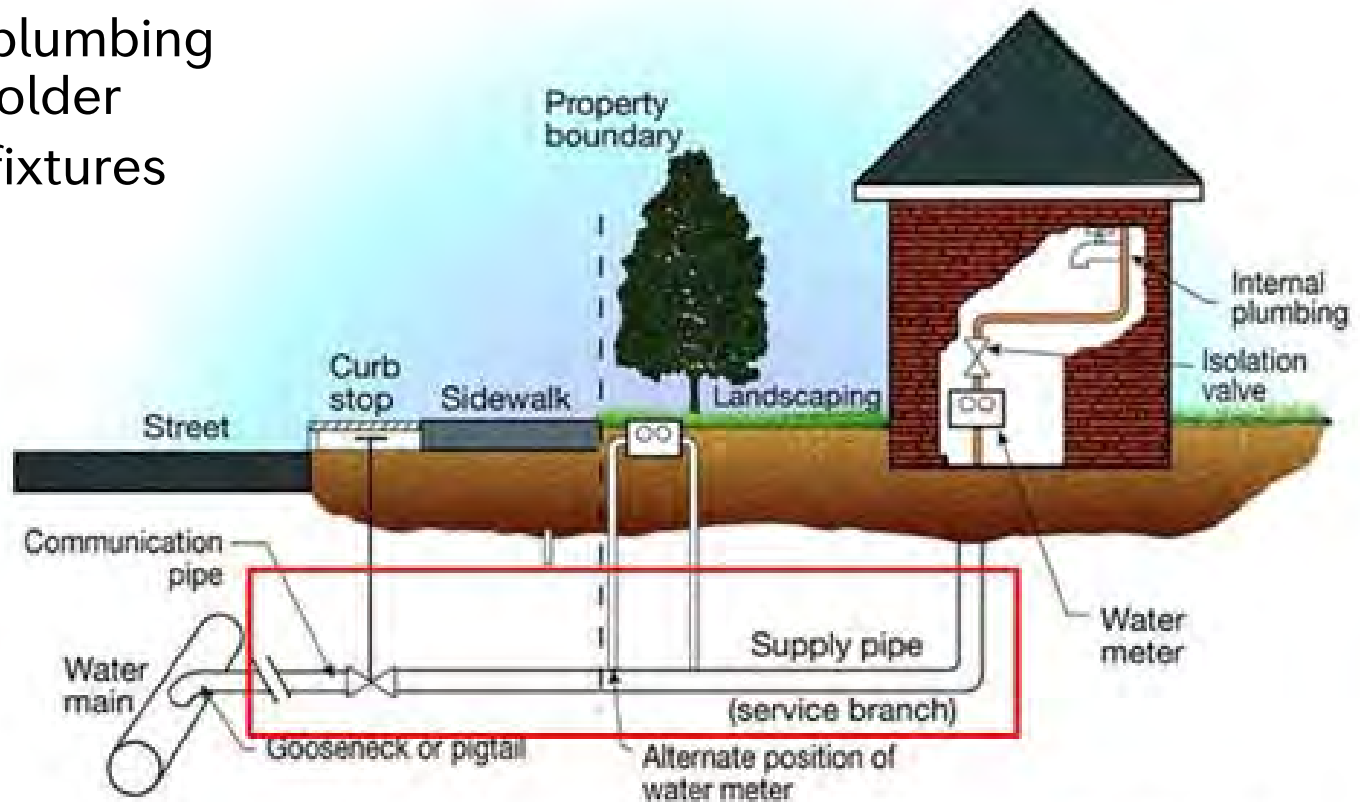
- Plumbing derived from “plumbum” which is Latin for “lead”
- Used 1800’s and early 1900’s
- Health effects started to be observed in late 1800s



- Malleable and easy to bend
- Characterized by “bulb” shape
- Goosenecks use near water mains – also called pigtails

# Where Is The Lead?

- Goosenecks
- Company service line
- Customer service line
- Customer plumbing including solder
- Customer fixtures



Timothy Phillips, 2008

# Health Effects of Lead

- Children Most Susceptible
  - Damage to brain, red blood cells and kidneys
  - Low IQ, hearing impairment, reduced attention span
  - Poor classroom performance



- Adults Can Be Impacted
  - Increased blood pressure
  - Pregnant women – lower birth weight and slowing of child development

# Lead and Copper Rule

- Overview of LCR
  - Purpose to protect public health by reducing water corrosivity
  - Established an action level (AL) of 15 ug/L for lead
  - Based on 90<sup>th</sup> percentile of home samples
  - Number of homes sampled based on size of water system
- Sampling Plan:
  - 100% must be Tier 1 sampling sites if available (built after 1982 but before the effective date of State's lead ban or contain lead pipes)
  - 50% must have lead service lines if possible
  - Samples must be collected after a 6-hr minimum stagnation period
  - Home cannot have Point of Entry treatment



# Lead and Copper Rule (continued)

- Challenges

- Which homes are Tier 1?
- Where are the lead service lines?
- Will customers provide samples?
- Will samples be collected in accordance with protocols?

- An AL exceedance is not a violation but triggers:

- Water quality parameter monitoring
- Corrosion control treatment
- Source water monitoring/treatment
- Public education (Pb)
- Lead service line (LSL) replacement



# What Are We Doing To Protect Our Customers?

- A. Customer Lead Testing and Communications
- B. Lead Service Line Inventories and Communications
- C. Construction-Related Procedures and Communications



# A. Customer Lead Testing and Communications

1. Responding to Customer Requests for Testing
2. Special Considerations for Commercial Facilities such as Schools, Daycare Centers, Hospitals, Nursing Homes, Etc.
3. Customer Follow Up when the Lead Action Level is Exceeded
4. HomeServe Customers
5. Ongoing Follow-Up for Customers with Customer-Owned Lead Service
6. Additional Communications





# Responding to Customer Requests for Testing

- Stagnation and Post-Flush Samples
- Verbal and Written Follow-Up
- Determine if Sample Needs to be Included in LCR Program
  - During LCR sampling period?
  - Tier 1 and/or has LSL?
  - Sample collected in accordance with LCR protocol?



# Special Considerations for Commercial Facilities

- Provide testing at a minimum of one sample location per Aqua standard protocol
- Provide educational materials such as EPA's 3T's for Reducing Lead in Drinking Water in Schools, October 2006
- At school's request, provide bottles and lead analyses for a modest fee to support extensive sampling programs
- Sampling plan and sample collection by school, not Aqua
- Provide forensic support in certain situations every circumstance is unique



# Customer Follow Up for High Lead Levels

## Questions to Ask

- Lead Service Line?
- Water Softener or Other Treatment?
- Extended Stagnation Period?
- Hot Water Sample?
- Recent Plumbing Change?
- Improper Grounding?
- Poor Solder Job?

## Actions to Take (as appropriate)

- Forensic Evaluation (more testing)
- Recommend Customer LSL Replacement
- Replace Company LSL
- Coordinate Combined Replacement
- Verbal and Written Communications



# Forensic Case Study for Lead

Date	Location/Type	Immediate	5-Minute	SL Flush
2/12/2016	Kitchen	140 ug/L	31 ug/L	
2/22/2016	Kitchen	151 ug/L	30 ug/L	
3/4/2016	Kitchen	120 ug/L	35 ug/L	42 ug/L
	Bathroom	ND	ND	ND
	Basement	ND	2 ug/L	
3/8/2016	Kitchen #1 (250 ml)	135 ug/L		
	Kitchen #2 (250 ml)	175 ug/L		
	Kitchen #3 (250 ml)	146 ug/L		
	Kitchen #4 (250 ml)	98 ug/L		
4/11/2016	New Kitchen Faucet	116 ug/L	44 ug/L	
	Bathroom	ND	ND	
5/2/2016	New Kitchen Plumbing	ND	ND	

# Forensic Case Study for Lead (continued)

**1**

Location 1 Scrapings  
25% Pb

"Material collected at the clog in the "T" at number 1 and digested by the lab."  
"Result: 8.3% Lead"

**2**

Location 3 Scrapings  
9.3% Pb

**Premise Location**

Aqua PA Main System

- ✓ Southern Division
- ✓ Tower Clifton Heights
- ✓ Plate J-32

Row House Built 1947  
Internal Plumbing: All Copper  
Tap on 6" Cast Iron Main: 1947  
Average Pressure: 70 PSI

**Legend**

Red= Positive for Lead Solter  
Blue= Negative for Lead Solter

**3**

**4**

**5**

Customer contacted Aqua PA on 4/1/16. Lead test waiting that for QA's review. On 4/2/16, 100 mg amount of lead. Bottle for testing on 4/2/16 that week.

Analysis of 5 Kitchen Faucet 2/12/16

Follow-up Water Analysis at Kitchen Faucet 2/22/16

Follow-up Water Analysis at Kitchen, 2<sup>nd</sup> F. Bathroom Sink and Basement Sink 3/14/16

Follow-up Water Analysis at Kitchen and Basement Sink after Service Line Replaced 2/18/16

Customer Analysis Utilizing Breakdown Samples from Faucet 2/18/16

4/7/16 - Customer Saw E-mail stating the faucet was replaced and water was ready for sampling. The old faucet was brought back for analysis which no lead was found in any samples.

After Kitchen Faucet Replaced 4/11/16

Best Practices for Lead Service Line Replacement

## B. LSL Inventories and Communications



1. Developing an Inventory
2. Creation of Maps
3. Annual Notifications to Customers with LSLs

# Developing an Inventory

## Sources of Data

- Tap Cards
- Customer Database
- Meter Setting and other Field Operations
- LCR Program
- Construction Projects
- Surveys and Phone Calls

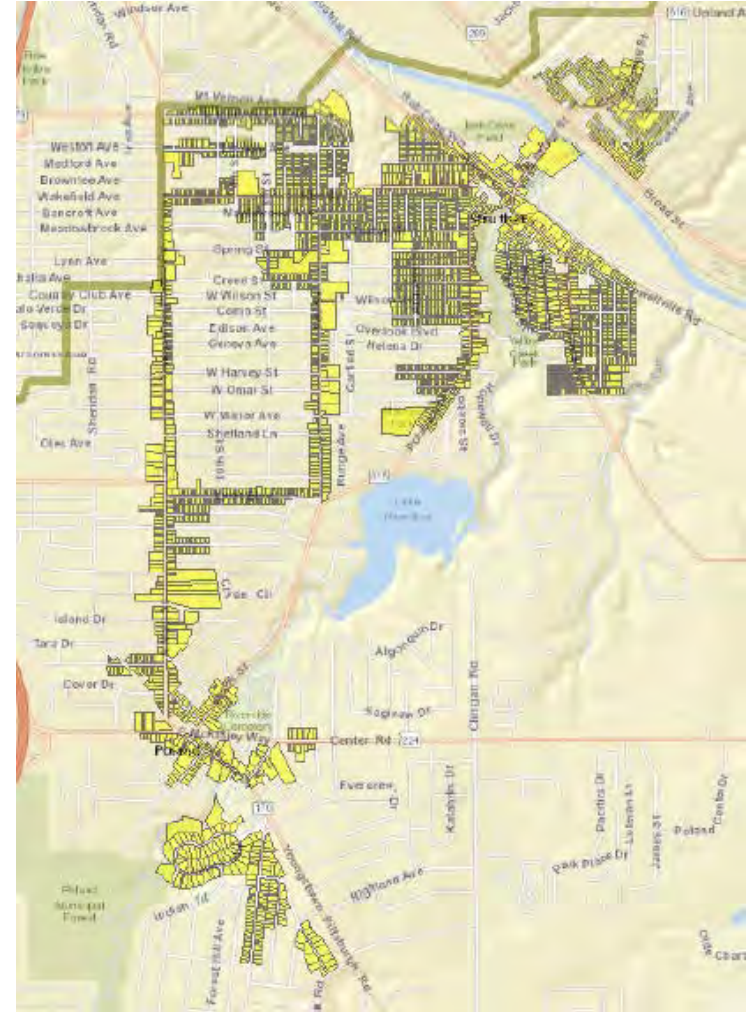
## Inventory Tools

- Customer Database
- Field Tablets Feeding Database
- Construction Forms
- Excel Spreadsheets
- GIS



# Creation of Maps – Many Considerations

- State Requirements
- Disclaimers on Purpose
- Drawing Scale
- Use of Color
- Varying Levels of Certainty
- How to Show
  - Company vs. Customer LSL
  - Known vs. Unknown
  - Streets/Areas vs. Premises
  - Property Boundaries?





# Annual Notification to Customers with LSLs

- Educational materials
- Recommendation for replacement
- Request for Aqua to be present during replacement to inspect replacement and to replace company LSL if found
- PA Pilot of 464 letters sent in February; low response rate
- Program will continue to be rolled out in PA and other states



# C. Construction-Related Procedures

1. Pre-Construction Notification
2. Identification of Lead Service During Construction
3. Customer Follow-Up for Partial Replacements
4. Customer Follow-Up When Customer Side Unknown
5. Multi-Family or Multi-Business Dwellings
6. Ongoing Customer Communications for Customer LSLs



# LSL Replacements

- Planned Project – “Ideal World”
- Leak Repair – “Non-Ideal World”
- Avoid Partial Replacements if Possible - could increase lead levels!



# Pre-Construction Notification

- Pre-Construction Notification
- Revise to Fit Project
- Use With or Without Lead Paragraph



*What if a lead service line is encountered? (Optional language to be included if lead service lines may be encountered)*

Before the project begins, Aqua will attempt to identify any lead service lines impacted by the main replacement project, and will notify you if we know or have reason to believe that there is a lead service line providing water to your premise. If there is an Aqua-owned lead service line, we will replace it during the project. If you own a lead service line, we encourage you to replace it as soon as possible.

Aqua will provide you with instructions for flushing your plumbing and will contact you within 1-2 business days to arrange for water testing if lead service lines are encountered.

# Identification of Lead Service During Construction

1. Use “An Important Health Notice from Aqua” tablets when a lead service line is encountered or if potentially present.
2. Fill out AQUA block as completely as possible.
3. Check boxes to indicate where lead was observed. State to determine phone number to use.
4. Leave form at residence the day that work was done.
5. Send blue copy to Aqua office as designated by State the same or next business day.

**AQUA**™ Premise No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_ Date: \_\_\_\_\_  
Address: \_\_\_\_\_  
Your Aqua representative: \_\_\_\_\_ Employee No. \_\_\_\_\_

Favor de no consumir el agua sin antes comunicarse con nuestro Departament de Servicio al Cliente al 877-987-2782.

## An Important Health Notice From Aqua.



During our maintenance/construction activities today, Aqua encountered:

- An Aqua-owned lead service line that provides water to your premise       A customer-owned lead service line that provides water to your premise

Further inspection is required      Please call Aqua during normal business hours at \_\_\_\_\_ to schedule an appointment.

# Customer Follow Up for Partial Replacements

Call customer same or next business day to provide:



1. Summary of situation
2. Possible water quality impacts and protective measures
3. Recommendation that customer replace their lead service
4. Offer to perform lead testing (stagnation and flush samples)

After phone call and lead testing, provide:



5. Letter summarizing activities
6. Resampling after 14 days, then monthly until lead levels no longer elevated
7. All results to customer in writing
8. Information to regulatory authorities and/or health department to meet any regulatory requirements
9. Copies of correspondence to Corporate Environmental Affairs

# Customer Follow Up When Customer Side Unknown

- Send letter to customer



When transferring the service line to your home at the above address, we discovered our side of the service line was lead but are uncertain as to the material of the pipe we connected to at the curb stop (your service line). We immediately replaced the pipe up to the curb stop with copper, and left information at your home instructing you on precautionary measures that you should take to minimize your likelihood of exposure to lead in your water. We encourage that you contact a plumber to evaluate your service line, and if it is lead, replace it as soon as possible.

# Multi-Family or Multi-Business Dwellings

- Research for possible lead service lines in advance.
- Send letter to building owner and follow up with a call.
- Work with owner to understand materials of construction.
- Develop tenant communication plan with owner if lead service lines are found and/or for follow up water testing
- Work directly with tenants if owner not cooperative
- Provide information to regulatory authorities and/or health department to meet any regulatory requirements
- Provide copies of correspondence to Corporate Environmental Affairs



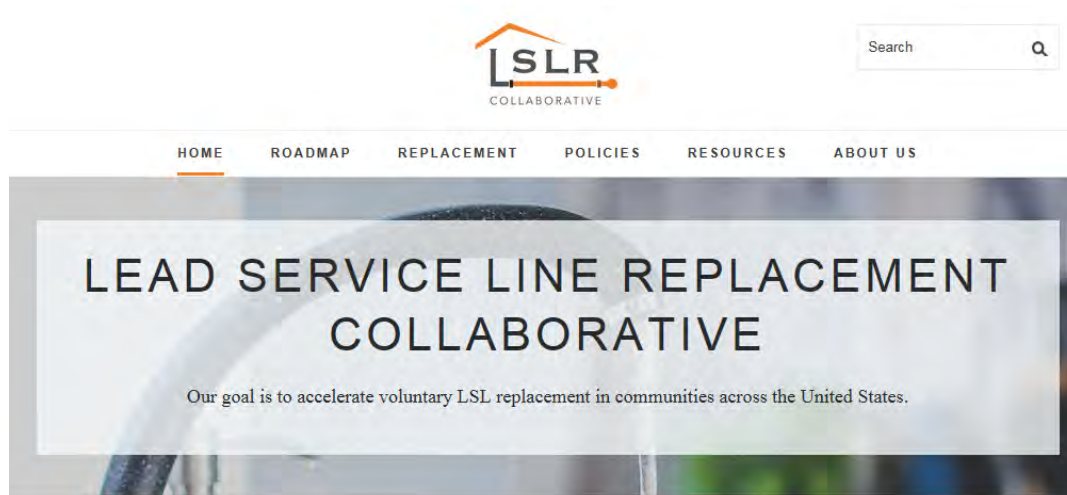


# Ongoing Customer Communications for Customers with Lead Service Lines

- Send letters to customers every month for five months after the post-construction letter and/or lead testing is completed
- Maintain premise information in customer database
- Upload data to GIS
- Generate letters to customers that have lead service lines every year



# Lead Service Line Replacement Collaborative




- Resource for Communities
- Provides roadmap and tools to support voluntary LSL replacement programs
- <http://www.lslr-collaborative.org/>

**What can I find on this site?**  
This site provides information to help communities facilitate full lead service line replacement.

### Getting Started

The roadmap poses a set of questions to help community leaders, elected officials, drinking water professionals, and public health professionals accelerate full lead service line replacement and tailor an initiative to local circumstances. It also includes links to information and examples from other communities. This information will help a community get from the initial decision to remove lead service lines to a plan ready for implementation.

Read more detail about Getting Started in the [Roadmap](#).

A photograph of a young girl with curly hair drinking water from a public fountain. She is looking down at the water as she drinks. The fountain is a simple, circular design with a metal spout.



# Questions?

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