

# HOW MUCH IS THIS ACTUALLY GOING TO COST?

## A Guide to Planning for LCRR First-Phase Implementation

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The long-term goal of the Lead and Copper Rule Revisions (LCRR) is to improve public health by limiting lead exposure to children, removing lead from drinking water, and educating the public on the importance of lead reduction in their communities.

Lead was widely used in plumbing materials until Congress banned its use in 1986. There are an estimated 5.5 to 7.1 million homes served by lead service lines (LSLs) in thousands of communities nationwide. In addition, there are millions of buildings across the US that still contain lead solder and brass/bronze fittings and faucets.<sup>1</sup>

According to EPA's Office of Ground Water and Drinking Water, the LCRR applies to 68,000 public water systems serving approximately 300 million people. The components of the LCRR program include:

- Sampling
- Corrosion Control Treatment

- LSL Inventory
- LSL Replacement
- Public Education and Outreach
- Drinking Water Systems Implementation and Administrative Costs

### WHAT ARE THE ESTIMATED COSTS?

A recent analysis by the American Water Works Association estimates 6.1 million lead service lines remain in US communities. Estimated replacement cost is \$30 billion but does not include full program costs to comply with the rule. EPA estimates that the total in-house cost of the rule to public water systems will be between \$257 million and \$594 million annually (2021 dollars).

These costs reflect in-house administrative, compliance monitoring, and field services that water utilities will need to provide on top of their current operation and maintenance activities.

### WHAT DOES THIS MEAN FOR NORTH CAROLINA UTILITIES?

The estimate provided by the EPA does not reflect the actual costs your utility may incur, how much money you should budget in your Capital Improvement Plan (CIP), or the proposed budget increases you should reference when talking with your board. Actual costs will be specific to each utility. For instance, if your sampling program reveals an unexpectedly high number of taps that exceed the new trigger level (TL) and require additional actions, internal staffing needs and costs will be higher than a utility with minimum exceedances.

So how much will it actually cost community water systems (CWSs) to implement the LCRR?

That may be a \$1 million question. Or a \$400,000 question. The reality is that, at this time, no one can realistically place an accurate price tag on all the costs associated



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with LCRR implementation. Compliance will be a multi-phased, multi-year process.

This article aims to help North Carolina utilities estimate realistic costs for LCRR implementation. Working with EPA's Economic Analysis as a foundation, research findings and industry experience were applied to develop cost estimates. Note: These estimates are conceptual,

planning-level costs only and will be highly dependent on utility-specific variables.

For this article, costs were limited to first-phase implementation activities. Subsequent phase costs will depend on the findings of the first phase. It is nearly impossible to predict long-term costs until you know the lead and copper issues your particular system may incur. It may be helpful

to visualize LCRR implementation in the context of a Utility Master Plan, where study, evaluation, and planning are combined to determine future capital improvement costs.

EPA Economic Analysis also includes an activity toolbox to be used by CWSs. The charts in this article contain the toolbox activities recommended by EPA for each component.

The components associated with the first phase are primarily investigative in nature and include:

- Sampling
  - Lead Tap Sample Monitoring
  - School and Childcare Sampling
- LSL Inventory and Replacement
  - LSL Inventory
  - LSL Replacement Plan

### AN EXAMPLE SCENARIO: AGUA COMMUNITY WATER SYSTEM

Let us walk through an example to help estimate the costs of implementing the first phase of the LCRR for a typical North Carolina CWS called Agua. In this scenario, Agua is owned by a local government.

For a CWS with a population served category of 10,000 to 100,000, the total number of sites under standard monitoring is 60. For this exercise, LSL is present in Agua's system and the system conducts lead tap monitoring every 3 years. **Table 1** summarizes the CWS attributes of Agua.

Following are the components, toolbox activities, and estimated costs that Agua can anticipate in the first phase of the LCRR.

### Sampling Component

There are two aspects to the sampling component: lead tap sample monitoring and school and childcare sampling.

#### Lead Tap Sample Monitoring

Systems will need to conduct different schedules for lead tap sample monitoring depending on their lead 90th percentile level (P90). There are three P90 ranges:

- (1) below or equal to the new TL (TL = 10ppb),
- (2) above the TL and below or equal to the Action Level (AL=15ppb), or
- (3) above the AL.

Under the LCRR, systems with LSLs must collect **all** tap samples from sites

ATTRIBUTE DESCRIPTION	SELECTION
Raw Water Source Type	Surface Water
Population	50,000
Lead Tap Sampling Sites	60
Ownership Type	Local Government
Schools	20 elementary schools 5 secondary schools 150 childcare facilities
LSLs Present	1,500
Lead Tap Monitoring	60 samples
P90 Range	above TL and below AL

Table 1. CWS Attributes For Scenario Example, Agua

**Trash-Guard® catch basin filter screens**  
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served by LSLs, if possible. Under the old LCR, systems were required to sample 50% of these locations. Moreover, CWSs can offer an incentive to encourage participation in the lead tap monitoring program. The EPA assumes 75% of systems are expected to offer an incentive, which ranges from \$25 to \$100.

For Agua, it is assumed a P90 range above the TL of 10ppb and below the AL of 15ppb. Agua proposes an incentive plan of \$100 to each of its water customers to encourage participate in the lead tap monitoring program. **Table 2** reflects the toolbox of activities that Agua may use for lead tap sample monitoring.

1	Update sampling instructions.
2	Contact homes / new 100% LSL tap sample tool.
3	Report changes in sampling location.
4	Recruit household volunteers.
5	Offer incentive to households for participation.
6	Deliver sample material and instructions.
7	Pick up lead samples.
8	Determine if a lead tap sample is invalid.
9	Inform customers of results.
10	Certify to primacy agency that results are reported.
11	Draft and submit report on results.
12	Total one-time costs and per-sampling period.

Table 2. Toolbox for Utilities: Lead Tap Sample Monitoring

Lead tap sampling, site selection tiering, and sampling frequency requirements under the LCRR increase the costs to CWSs with LSL. The EPA Economic Analysis estimates the total annual cost for the lead sampling monitoring ranges from \$37.6 to \$42.9 million (2016 dollars) nationwide.

**Agua Estimated Cost Range for Lead Tap Sample Monitoring: \$25,000 to \$50,000.**

**School and Childcare Sampling**

Sampling at schools and childcare facilities are totally new requirements for CWSs under the LCRR. CWSs will be required to conduct lead sampling at schools and licensed childcare facilities constructed before January 1, 2014. CWSs must conduct sampling at 20% of elementary schools and 20% of childcare facilities per year. **Table 3** includes the toolbox of activities that may be associated with school and childcare sampling.

1	Identify primary contacts in the service area.
2	Prepare and distribute sampling program and 3Ts toolkit.
3	Establish sampling schedule.
4	Coordinate logistics of collecting the samples.
5	Conduct walkthrough before the start of sampling.
6	Travel to, collect, and analyze samples commercially.
7	Provide sampling results to facilities, primacy agency.*
8	Prepare and submit annual report on sampling program.

*\*Primacy agencies will be established by each state.*

Table 3. Toolbox for Utilities: School and Childcare Sampling

In its Economic Analysis, the EPA estimates the total annual cost for the lead sampling monitoring is \$28.5 million (2016 dollars) nationwide. **Agua Estimated Cost Range for School and Childcare Sampling: \$30,000 to \$60,000.**

**LSL Inventory and Replacement Plan Component**

The cost involved includes these two components.

**LSL Inventory**

Under the LCRR, all CWSs are required

to develop an LSL materials inventory immediately after rule promulgation. The inventory includes initial planning requirements in Years 1 through 3. The LSL inventory must be updated annually or triennially, based on the CWS's tap sampling frequency.

The inventory must identify LSLs (both portions owned by the system and customer), service lines of unknown materials, and galvanized iron service lines that are currently or formerly downstream of an LSL. Systems serving more than 100,000 will be required to make the inventory available to the public online.

The EPA Economic Analysis provides limited guidance on how to develop an LSL materials inventory. However, Geographic Information System (GIS) may provide the most reliable tool for conducting and cataloging the inventory data.

**LSL Replacement Plan**

Based on the inventory, systems with known or possible/unknown LSLs must develop a Lead Service Line Replacement (LSLR) plan. The replacement plan describes how the system will implement and fund an LSL replacement program and negotiate an LSL replacement goal rate in coordination with the primacy agency, should the system exceed the TL. It is important to note that the Water Research Foundation estimates that 6 and 10 million LSLs are in active use in the US.

For our example, the estimated cost for developing a basic online GIS mapping solution ranges from \$6,000 to \$10,000. However, significant additional costs will be incurred for ancillary costs, data collection, data cleanup, and analytical features. It should be noted that the estimated cost for LSL replacement is approximately \$6,000 per service line and is not included as part of the replacement plan.

The EPA Economic Analysis estimates the total annual cost for the LSL inventory ranges from \$5.6 million to \$8.6 million (2016 dollars) nationwide. Agua Estimated Cost Range for LSL Inventory and Replacement: \$50,000 to \$250,000.

## Public Education and Outreach Component

The LCRR revisions require a number of updates to public education and additional outreach activities associated with LSLs. These public education requirements apply to all CWSs, regardless of their lead 90th percentile tap sample levels.

The toolbox of activities for public education and outreach are included in

**Table 4.**

1	Update Consumer Confidence Report.
2	Develop an outreach plan for new customers.
3	Develop approach for improved public access info.
4	Establish a process for customers to access info.
5	Maintain the process for customers to access info.
6	Provide info about LSLs in response to requests from homeowners, realtors, and inspectors.
7	Participate in joint communication with healthcare providers.
8	Develop public education materials for delivery for Primacy Agency review.
9	Deliver public education material during water-related work.
10	Certify to the primacy agency that LCR-related public education is completed.

Table 4. Toolbox for Utilities: Public Education and Outreach

Significant updates to existing public education and additional outreach activities associated with LSLs will also be required. The EPA Economic Analysis estimates the total annual cost for the public education and outreach ranges from \$29.3 million to \$35.4 million (2016 dollars) nationwide. **Agua Estimated Cost Range for Public Education and Outreach: \$20,000 to \$40,000.**

### SUMMARY

Our imaginary CWS, Agua, is owned by a local government and has a population

COMPONENT	ESTIMATED COST RANGE
<b>Sampling</b>	
Lead tap sample monitoring	\$25,000 – \$50,000
School and childcare sampling	\$30,000 – \$60,000
LSL Inventory and Replacement Plan	\$50,000 – \$250,000
Public Education and Outreach	\$20,000 – \$40,000
<b>TOTAL ESTIMATED FIRST-PHASE IMPLEMENTATION COSTS</b>	<b>\$125,000 – \$400,000</b>

Table 5. Estimated Cost for Agua to Implement First Year of LCRR

of 50,000. Agua’s raw water source is surface water. The system has 1,500 LSLs present. The community has 20 elementary schools, five secondary schools, and 150 childcare facilities.

Based on the EPA Economic Analysis, research, and industry experience, the estimated costs for Agua to implement the first year of the LCR revisions are highlighted in **Table 5**.

These costs are based on 2021 dollars and represent planning-level estimates only. Actual costs will vary from utility to utility.

It should also be noted that primacy agencies will be appointed for each state. In addition, health departments will likely weigh in on CWS findings. Involvement by these two agencies may increase the cost of implementation.

### CONCLUSION AND NEXT STEPS

Implementation of the LCRR will require a multi-year, multi-phased approach. This article focuses solely on first-phase components; subsequent phases will depend on what is uncovered during the first-phase implementation.

Readers should understand that there are many variables that can and will affect implementation costs for the LCRR. For this article, estimated costs for the imaginary CWS range from \$125,000 to \$400,000 for first-phase implementation.

Conversely, a midwestern water utility retained a consultant to assist in developing and implementing their LCRR program at a fee of approximately \$2.5 million. The utility estimates that approximately 20% of their 300,000+ service lines contain lead and will need to be replaced. The lead service line replacement and water quality improvement program will

be implemented over 15 years at an estimated cost of \$605 million.

Utilities should begin now to plan and perform the sampling, LSL inventory and replacement, and public education and outreach components for first-phase implementation of the LCRR. Even though it is possible that the current administration will further revise the revisions and compliance dates, it is best to be proactive. Budget, prepare sampling plans early, create or update your GIS inventory, and position yourself for success when the revisions are finalized.

### ABOUT THE AUTHOR

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