



Association of State Drinking Water Administrators

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# Costs of States' Transactions Study (CoSTS)

For Potential Long-Term Revisions to the  
Lead and Copper Rule (LT-LCR)

**April 2018**





**The Association of State Drinking Water Administrators (ASDWA)** is the professional Association serving state drinking water programs. Formed in 1984 to address a growing need for state administrators to have national representation, ASDWA has become a respected voice for state primacy agents with Congress, the United States Environmental Protection Agency (EPA), and other professional organizations.

## **Costs of States' Transactions Study (CoSTS)**

### **For Potential Long-Term Revisions to the Lead and Copper Rule (LT-LCR)**

The Environmental Protection Agency (EPA) is in the process of evaluating several options for potential Long-Term Revisions to the Lead and Copper Rule (LT-LCR). EPA initially presented several options at a [Federalism Consultation briefing](#) on January 8, 2018 and requested comments by March 8, 2018. The Association of State Drinking Water Administrators (ASDWA) conducted this Costs of States' Transactions Study (CoSTS) as part of its comment development process for these regulatory options. The detailed spreadsheets included in this study calculate the estimated hours for the five categories of regulatory options presented at the January 8<sup>th</sup> meeting, plus an additional category for "Regulatory Start-Up". A second additional category for the determination of "bins" (detailed below) was added to the final CoSTS.

Any LT-LCR option that is ultimately selected by EPA will lead to increased workloads for the states. The specifics of the final regulatory option(s) do not really matter, as any regulatory change to the current Lead and Copper Rule (LCR) will lead to additional actions by the states – from tracking what is submitted to reviewing to ensure that it's correct to helping systems revise incorrect submissions to training and technical assistance to compliance and enforcement. Additionally, any new drinking water regulation has a "start-up" phase for the first few years that includes developing and adopting the state-level regulation that is at least as stringent as the federal regulation, revising the data management system and associated operating procedures, providing training and technical assistance to the water systems, and providing training to state staff on the requirements of the regulation.

The four most recent drinking water regulations have more treatment technique based regulatory frameworks. These newer regulations have been more complex for states to implement versus the traditional numerical Maximum Contaminant Levels (MCLs) in the older regulations:

- Stage 2 Disinfection By-Products Rule (DBPR) and Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR)
- Groundwater Rule (GWR); and
- Revised Total Coliform Rule (RTCR).

Each of these regulations requires states to investigate and/or review an investigation or assessment by a water system or consultant. The RTCR is probably the most comparable regulation to the options being considered for the LT-LCR due to its regulatory framework that has the water system or state personnel, or qualified assessor analyze the water system to determine what created the problem. The RTCR workload for the states is significant due to the complexities of the regulation and the need to conduct/review distribution system assessments. 8,306 Level 1 and Level 2 assessments were estimated to be conducted in 2016 (the first year of these corrective actions) by EPA's contractor (Cadmus), in cooperation with state representatives, for 49 states (Wyoming doesn't have primacy). The combined national RTCR workload for 49 states was estimated by Cadmus to be 784,218 hours for 2018 – this estimate includes these assessments but also includes several other RTCR implementation activities. These RTCR hours can be used to validate ASDWA's estimates for LT-LCR implementation.

The initial estimate submitted in [ASDWA's comments](#) by the Agency's deadline of March 8<sup>th</sup> (60 days from the initial January 8<sup>th</sup> meeting) estimated the total increased workload for the states for the LT-LCR to range from 3.6 million hours to 4.9 million hours for the first five years of the final revised LCR, depending on the Corrosion Control Treatment (CCT) option selected. Additional estimates that were developed for the determination of "bins" added 215,719 hours to this initial estimated, increasing the total to 3.8 million hours to 5.0 million hours as detailed in Table 1, noting that the range of CCT options is shown as Low (L) and High (H) Hours.

**Table 1 - Summary of Estimated Hours for Potential Options for the LT-LCR**

<b>Category</b>	<b>Hours(L)</b>	<b>Hours(H)</b>
Regulatory Start-Up	582,100	582,100
Bin Determinations	215,719	215,719
Lead Service Line Replacement (LSLR)	813,114	813,114
Corrosion Control Treatment (CCT)	10,430	1,230,328
Public Education & Transparency	518,292	518,292
Tap Sampling	1,479,457	1,479,457
Copper	581,487	581,487
Total from LCR Long-Term Revisions	4,200,599	5,420,497
<i>Current LCR Hours (2018)</i>	<i>380,830</i>	<i>380,830</i>
Increased Workload from LCR Revisions	3,819,769	5,039,667

The estimated hours in Table 1 for the first five years of LT-LCR implementation need to be converted to an annual basis to better facilitate a comparison with EPA's traditional economic analysis. Dividing the bottom lines in Table 1 by five to convert to annual hours results in a range of 763,954 to 1,007,993 hours annually (note that this range brackets the RTCR hours for 2018 previously discussed). Assuming a loaded (direct and indirect costs) hourly rate of \$100 per hour for a state engineer, this translates to additional burden of \$76 million to \$100 million annually to states for the LT-LCR. Given the states' ongoing challenges in meeting EPA's requirements for the existing drinking water regulations, this is a significant increase. This potential increase exacerbates the gradual erosion of federal funding from the Public Water System Supervision (PWSS) program from \$105 million in FY 10 to \$102 million annually for the past four fiscal years (FY 14 to FY 17). This flat funding also doesn't take inflation into account.

A similar set of activities by state staff was used to develop the detailed estimate of hours for each of the above categories. The activities are:

- Tracking – any inventory or plan developed by a water system or their consultant would have to be tracked in the state's data management systems;
- Reviewing the inventories and plans;
- Following-up with those systems whose submission isn't quite correct;
- Reporting the results of each of the regulatory activities in each category to the state's data management system, and ultimately, to EPA;
- Violations for a certain percentage that either can't quite get their submissions correct or miss the submission deadlines;

- Returning those systems to compliance through a combination of training, technical assistance, compliance and enforcement; and
- Some periodic re-evaluation of the inventories and/or plans based on changing circumstances.

The above set of activities were repeated in the spreadsheets for the five categories, plus two additional categories (the first for “Regulatory Start-Up” and the second for determination of “bins”), that were presented at [EPA’s January 8<sup>th</sup> Federalism Consultation Meeting](#). The percentages for the different water system sizes, as well as the hours for each activity, were adjusted depending on the relative complexity of the specific regulatory requirements in each category.

The percentages and the hours for each activity in each category were developed by ASDWA staff (in consultation with some state staff) and then vetted with the ASDWA Board of Directors in February 2018. For example, the estimated hours per review for tap sampling plans compare to EPA’s contractor (Cadmus) estimates for reviews of RTCR sampling plans. Estimates were also compared to the model developed for [ASDWA’s 2013 state drinking water resource needs report](#).

EPA presented questions on five topics at the initial [Federalism Consultation meeting on January 8, 2018](#). The challenge ASDWA faced was how to connect the topics together in a holistic regulatory framework that shows how each integrates with the other. ASDWA’s Board of Directors met this challenge by developing a progressively more stringent regulatory framework based on increasing levels of the 90<sup>th</sup> percentile of lead samples for 1-liter first draw tap samples. The framework fits the pieces of the regulatory “jigsaw puzzle” together into a holistic approach and targets more stringent regulatory treatment technique requirements where they are needed most. The “bins” regulatory framework is detailed in Table 2.

**Table 2 – “Bins” Regulatory Framework for LT-LCR**

Bin	Lead 90 <sup>th</sup> percentile	Corrosion Control Treatment (CCT)	Lead Service Lines (LSLs)	Water Quality Parameters (WQPs)	PE and Outreach Materials	Tap Sampling
#1	0-5.0 µg/L	Retain current requirements for triggering installation of CCT	Retain current requirements for triggering LSL replacement (LSLR)	Retain current requirements for WQP monitoring for systems with CCT	Provide public education (PE) in Consumer Confidence Report (CCR) & other delivery channels	Retain frequency & triggers in current rule. Allow triennial monitoring
#2	5.0-10.0	Retain current requirements for triggering installation of CCT	Develop LSLR plan & pilot LSLR plan	WQP assessment to evaluate changes in water chemistry	Deliver targeted PE for homes with LSLs	Annual monitoring with standard number of sites. No triennial monitoring
#3	10.0-15.0	Require CCT study that	Implement proactive	Increase frequency and	Deliver targeted PE to areas of	Monitor every six months

		identifies appropriate CCT if Action Level (AL) is exceeded – Implement distribution system find & fix protocol	voluntary LSLR	number of sampling sites for WQP monitoring. Recommend optimal WQP ranges as part of CCT study	distribution system based on find and fix	
#4	>15.0 µg/L	Require CCT	Implement mandatory LSLR	Require WQP monitoring based on CCT	Deliver broader PE and outreach materials for all	Monitor every six months

Each bin in Table 2 builds upon the previous bin. For example, a system in bin #2 must comply with the regulatory requirements in both bins #1 and #2. A system in bin #3 must comply with the regulatory requirements in bins #1, #2, and #3. A system in bin #4 must comply with all the requirements in all bins. The initial determination of bins, and ongoing bin tracking and review, added additional hours to the final CoSTS.

Some of ASDWA’s members have taken actions such as reviewing materials and lead service line (LSL) inventories, corrosion control treatment (CCT) and water quality parameter (WQP) monitoring that go beyond the regulatory requirements of the 1991 LCR, based on the [2016 Joel Beauvais’ letters to governors and state environment and public health commissioners](#). However, these actions are strictly voluntary for the states that can take such actions. Many states have constitutional amendments or state-level policies such that their regulations must exactly match the federal regulations and are no more stringent than the federal regulations.

Given this restriction for many states, EPA should use the baseline hours and costs from the 1991 LCR and not consider any post-Flint actions by states. The current LCR hours in 2018, shown in italics in the above table, came from [ASDWA’s 2013 state drinking water resource needs report](#). This report estimated the hours for each regulation for 2012-2021, so this report provides us with an accurate estimate of the current LCR hours in 2018 based on the 1991 LCR. These baseline hours should be used as the starting point for the economic impact analysis for the LT-LCR.

The estimated number of hours above doesn’t consider every potential regulatory impact to states from the final LT-LCR. For example, calls for information from consumers, the media, and other state-level staff could result a sizeable number of hours that would likely increase the states’ costs for the LT-LCR. Training for the LT-LCR for state staff, water systems, consultants and technical assistance providers could be higher than these estimates, as the LT-LCR is likely going to be the most complex drinking water regulation. The ultimate costs to states’ drinking water programs could increase above the Public Water System Supervision (PWSS) program funding of \$102 million annually for the past five fiscal years (FY 14 to FY 18). If EPA is interested in continuing additional discussions with ASDWA on the “bin” regulatory option, then ASDWA would consider developing an estimate of those additional hours at some point in the future.

Obviously, the final estimated hours for the LT-LCR will depend on many factors, such as the regulatory option ultimately selected as well as how the compliance deadlines might be staggered during the regulatory start-up period. However, as previously discussed, any LT-LCR option that's ultimately selected by EPA will almost certainly lead to an increased workload for the states – it's just a question of how big the increase will be.

Funding options for states are limited, as funding for the states' ability to fulfill their mission of overseeing safe drinking water comes from four sources. Two primary sources are from EPA's Public Water System Supervision Program (PWSS) and the set-asides from EPA's Drinking Water State Revolving Loan Fund (DWSRF). The DWSRF funding has been essentially been flat for the past decade, so that inflation has resulted in a significant funding decline from the DWSRF set-asides over the past decade. Some states have been able to compensate by raising the dollars received from the DWSRF, but others already take the maximum percentage and must reduce expenditures. PWSS funding has gradually eroded for the past decade between inflation and a slight decline from \$105 million in FY 10 to \$102 million annually for the past four fiscal years (FY 14 to FY 17). The other two funding sources vary considerably from state to state and include funding from the state's general fund and fees from water systems for plan review, inspections, etc.

State drinking water programs have been chronically underfunded, on top of this gradual erosion of the DWSRF set-asides and the PWSS funding. ASDWA's 2013 state drinking water resource needs report estimated the funding gap of \$240 million for a minimum base program, and \$308 million for a comprehensive program that includes additional activities undertaken by states to achieve the public health protection vision and goals established by the SDWA. This report was a collaboration between EPA and ASDWA, using EPA's contractor (Cadmus) to collect the data (that was then validated by the states) and then generate the report. In an ideal world, funding for the PWSS program would be double what it is today (not including the final LT-LCR). This doubling of funding would need to be ramped up over a period of five to ten years to allow states and water systems to increase capacity for the appropriate activities that achieve the public health goals envisioned by the SDWA.

ASDWA estimates that the costs of states' staff time for the LT-LCR would be in the range of 76%-99% of the current PWSS funding. Given the uncertainties surrounding what regulatory components might (or might not be) included in the final LT-LCR, this percentage could easily increase to over 100% of the current PWSS funding. Changes to one regulation, admittedly the most complex drinking water regulation, could potentially double states' workload. Given the likely increased workload and the additional hours for state staff from the LT-LCR, states could be facing tough choices for their drinking water program – what NOT to do given these new regulatory mandates. ASDWA supports moving forward with the LT-LCR to update and modernize the 1991 LCR but additional funding should be part of the final LT-LCR. Otherwise, the final LT-LCR will be an unfunded mandate for states.

# Summary of Estimated Hours for Options for Potential Long-Term Revisions to the Lead and Copper Rule (LT-LCR) Costs of States Transactions Survey (CoSTS)

## Association of State Drinking Water Administrators (ASDWA)

4/25/18 Version

The summary below is based on the five categories of options from EPA's Federal Consultation briefing on 1/8/18,  
plus two additional categories for regulatory start-up and bin determination

The total hours are estimated for the first five years of the LT-LCR

Five years is assumed to be an appropriate timeframe for the first cycle of states and systems adopting and complying with the LT-LCR

Estimated hours for Corrosion Control Treatment (CCT) are shown as a range (low-high), given the number of potential CCT options

Regulatory Start-Up	582,100		
Bin Determination	215,719		
Lead Service Line Replacment (LSLR)	813,114		
	Low	High	
Corrosion Control Treatment (CCT)	10,430	1,230,328	
Public Education & Transparency	518,292		
Tap Sampling	1,479,457		
Copper	581,487		
Totals	4,200,599	5,420,497	
Current LCR Hours (2018)			
76,166 times 5 Years	380,830	380,830	
Increased Hours from the LT-LCR	3,819,769	5,039,667	
(Total from first five years)			
Annual Increased Hours	763,954	1,007,933	
(Each year for the first five years)			

## Regulatory Start-Up

	Model Inputs
	Model Outputs

Hours for each activity rounded up from Revised Total Coliform Rule (RCTR)

Adoption of Long-Term Revisions to Lead and Copper Rule (LT-LCR)

States	Hours Ea.	Total Hours
49	3,200	156,800

Modify State Data Management System

Unclear how SDWIS Prime might accommodate LT-LCR and what state changes might be needed

States	Hours Ea.	Total Hours
49	3,700	181,300

System Training and Technical Assistance

States	Hours Ea.	Total Hours
49	4,000	196,000

State Staff Training

Assume three categories for training for state staff to properly trained on all components of LT-LCR

Lead service line inventories & replacement, corrosion control treatment, public education, sampling & simultaneous compliance

		Hours Ea.	Total Hours
	Large	9	2,000
	Medium	20	1,000
	Small	20	500
Not Wyoming or DC	Total	49	48,000

This total for state staff training is in the same range as what was estimated for the Revised Total Coliform Rule (RCTR)

Total Regulatory Start-Up	582,100
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Bin Determination

	# of systems
Large systems >50,000	943
Medium 3,301-50,000	8,296
Small 25-3,300	70,657
Total number of systems	79,896

	Model Inputs
	Model Outputs

- Assume states will use the latest two rounds of LCR Compliance Monitoring for initial bin determination, using the higher 90th percentile
- Assume states's review of initial bin placement will be relatively short since it's a 90th percentile but some data review will be needed
- Assumes a small percentage (10%) of systems will want to move to a lower bin whenever possible during the first five years
- Assumes 2 hours would be needed for bin re-evaluation (versus 1 hour for initial) due to more back-and-forth between systems and states

All systems		Hours Ea.	Total Hours
Tracking			
# of system	79,896	1	79,896
Review			
	79,896	1	79,896
Reporting			
	79,896	0.5	39,948
Periodic			
Bin Re-Eva	7,990	2	15,979
10%	Total		215,719

## Lead Service Line Replacement (LSLR)

	# of systems	Systems with LSLs	Model Inputs	Model Outputs	Systems without LSLs
Large systems >50,000	943	700	Complex LSL Inventories & LSLR Plans	243	
Medium 3,301-50,000	8,296	5,000	Moderate LSL Inventories & LSLR Plans	3,296	
Small 25-3,300	70,657	5,500	Simpler LSL Inventories & LSLR Plans	65,157	
Total number of systems	79,896	11,200	Total number of systems with LSLs	68,696	Total no. of systems without LSLs

Initial tracking, review and follow-up for LSL inventories - complexity of inventories based on system size and whether system has LSLs or not

Assume all systems have to conduct an inventory to determine if they have LSLs or not

Assume review of systems with LSLs will take more time than systems that don't have LSLs

Assume 30% of LSLR inventories would need to be re-evaluated periodically

Systems would find more LSLs than in original inventory or find a few LSLs in the system that were unknown initially

Large Systems with LSLs				Hours Ea.	Total Hours	Medium Sys. with LSLs				Hours Ea.	Total Hours	Small Sys. with LSLs				Hours Ea.	Total Hours
Tracking						Tracking						Tracking					
# of systems	700	2	1,400			# of systems	5,000	2	10,000			# of systems	5,500	2	11,000		
Review						Review						Review					
	700	16	11,200				5,000	8	40,000				5,500	4	22,000		
Follow-up						Follow-up						Follow-up					
15%	105	4	420			25%	1,250	4	5,000			40%	2,200	4	8,800		
Reporting						Reporting						Reporting					
	700	0.5	350				5,000	0.5	2,500				5,500	0.5	2,750		
Violations						Violations						Violations					
2%	14	4	56			20%	1,000	4	4,000			33%	1,815	4	7,260		
Return to Compliance						Return to Compliance						Return to Compliance					
	14	4	56				1,000	4	4,000				1,815	4	7,260		
Periodic LSL						Periodic LSLR						Periodic LSLR					
Inv. Re-eval.	210	8	1,680			Plan Re-eval.	1,500	6	9,000			Plan Re-eval.	1,650	3	4,950		
30%						30%						30%					
Total					15,162	Subtotal					74,500	Subtotal					64,020
											15,162						74,500
						Total					89,662						153,682

Large Systems without LSLs				Medium Sys. without LSLs				Small Sys. without LSLs			
		Hours Ea.	Total Hours			Hours Ea.	Total Hours			Hours Ea.	Total Hours
Tracking				Tracking				Tracking			
# of systems	243	2	486	# of systems	3,296	2	6,592	# of systems	65,157	2	130,314
Review				Review				Review			
	243	4	972		3,296	3	9,888		65,157	2	130,314
Follow-up				Follow-up				Follow-up			
10%	24	4	97	10%	330	4	1,318	20%	13,031	4	52,126
Reporting				Reporting				Reporting			
	243	0.5	122		3,296	0.5	1,648		65,157	0.5	32,579
Violations				Violations				Violations			
2%	5	4	19	10%	330	4	1,318	20%	13,031	4	52,126
Return to Compliance				Return to Compliance				Return to Compliance			
	5	4	19		330	4	1,318		13,031	4	52,126

Total	1,716	30%	Subtotal	22,083
				1,716
		Total		23,799

Subtotal	449,583
	22,083
	1,716
Total	473,382

Assume 30% of LSLR plans would need to be re-evaluated periodically (same as for inventories)

Systems would find more LSLs than in original inventory or find a few LSLs in the system that were unknown initially

Assume 5% of systems initially without LSLs find a few LSLs in the system that were unknown but found via main breaks, etc.

Additional LSL systems (5%)

Large	12
Medium	165
Small	3,258

Large Systems	Hours Ea.	Total Hours
Tracking		
# of systems	712	2 1,424
Review		
	712	16 11,394
Follow-up		
10%	71	4 285
Reporting		
	712	0.5 356
Violations		
2%	14	4 57
Return to Compliance	14	4 57
Periodic LSLR		
Plan Re-eval.	214	8 1,709
30%	Total	15,283

Medium Systems	Hours Ea.	Total Hours
Tracking		
# of systems	5,165	2 10,330
Review		
	5,165	8 41,318
Follow-up		
10%	516	4 2,066
Reporting		
	5,165	0.5 2,582
Violations		
20%	1,033	4 4,132
Return to Compliance	1,033	4 4,132
Periodic LSLR		
Plan Re-eval.	1,549	6 9,297
30%	Subtotal	73,857
		15,283
	Total	89,139

Small Systems	Hours Ea.	Total Hours
Tracking		
# of systems	8,758	2 17,516
Review		
	8,758	4 35,031
Follow-up		
25%	2,189	4 8,758
Reporting		
	8,758	0.5 4,379
Violations		
33%	2,890	4 11,560
Return to Compliance	2,890	4 11,560
Periodic LSLR		
Plan Re-eval.	2,627	3 7,882
30%	Subtotal	96,687
		73,857
		15,283
	Total	185,826

Initial tracking, review and followup for pitcher filter distribution plans

Systems with LSLs	11,200		
	Hours Ea.	Total Hours	
Tracking			
# of systems	11,200	2	22,400
Review			
	11,200	2	22,400
Follow-up			
10%	1,120	1	1,120
Reporting			
	11,200	0.5	5,600
Violations			
2%	224	1	224
Return to Compliance			
	224	1	224
	Total		51,968

Total Lead Service Line Replacement 813,114

## Corrosion Control Treatment

	# of systems	
Large systems >50,000	943	Complex CCT
Medium 3,301-50,000	8,296	Moderate CCT
Small 25-3,300	70,657	Simple CCT
Total number of systems	79,896	

Model Inputs  
Model Outputs

Initial tracking, review and follow-up based on different regulatory triggers  
Assume 10% of CCT plans would need to be re-evaluated periodically

	# of systems
Option 1 >50,000	943
Option 2 >10,000	8,296
Option 3 >3,300	70,657
Option 4 w LSLs	11,200

Option 1	Hours Ea.	Total Hours
Tracking		
# of systems	943	2 1,886
Review		
	943	40 37,720
Follow-up		
25%	236	4 943
Reporting		
	943	0.5 472
Violations		
2%	19	4 75
Return to Compliance	19	4 75
Periodic CCT		
Re-eval.	94	40 3,772
10%	Total	44,943

Option 2	Hours Ea.	Total Hours
Tracking		
# of systems	8,296	2 16,592
Review		
	8,296	16 132,736
Follow-up		
25%	2,074	4 8,296
Reporting		
	8,296	0.5 4,148
Violations		
20%	1,659	4 6,637
Return to Compliance	1,659	4 6,637
Periodic CCT		
Re-eval.	830	16 13,274
10%	Subtotal	188,319
		44,943
	Total	233,263

Option 3	Hours Ea.	Total Hours
Tracking		
# of systems	70,657	2 141,314
Review		
	70,657	4 282,628
Follow-up		
50%	35,329	4 141,314
Reporting		
	70,657	0.5 35,329
Violations		
33%	23,317	4 93,267
Return to Compliance	23,317	4 93,267
Periodic CCT		
Re-eval.	7,066	4 28,263
10%	Subtotal	815,382
		188,319
		44,943
	Total	1,048,644

Option 4	Hours Ea.	Total Hours
Tracking		
# of systems	11,200	2 22,400
Review		
	11,200	16 179,200
Follow-up		
25%	2,800	4 11,200
Reporting		
	11,200	0.5 5,600
Violations		
20%	2,240	4 8,960
Return to Compliance	2,240	4 8,960
Periodic CCT		
Re-eval.	1,120	16 17,920
10%	Total	254,240

In-line POU Option for Systems with LSLs

Tracking		
# of systems	11,200	2 22,400
Review		
	11,200	6 67,200
Follow-up		
25%	2,800	4 11,200
Reporting		
	11,200	0.5 5,600
Violations		
20%	2,240	4 8,960
Return to Compliance	2,240	4 8,960
	Total	115,360

Default CCT Option

Assume no state review of default CCT - only review of system-demonstrated equivalence

Assume same system size triggers as above, with an assumed percentage (20%) using system-demonstrated equivalence

Assume 10% of CCT plans would need to be re-evaluated periodically

Option 1	Hours Ea.	Total Hours
Tracking		
# of systems	943	2 1,886
Review		
20%	189	20 3,772
Follow-up		
25%	47	8 377
Reporting		
	943	0.5 472
Violations		
2%	19	4 75
Return to Compliance	19	4 75
Periodic CCT		
Re-eval.	94	40 3,772
10%	Total	10,430

Option 2	Hours Ea.	Total Hours
Tracking		
# of systems	8,296	2 16,592
Review		
20%	1,659	8 13,274
Follow-up		
25%	415	4 1,659
Reporting		
	8,296	0.5 4,148
Violations		
20%	1,659	4 6,637
Return to Compliance	1,659	4 6,637
Periodic CCT		
Re-eval.	830	16 13,274
10%	Subtotal	55,583
		10,430
	Total	66,013

Option 3	Hours Ea.	Total Hours
Tracking		
# of systems	70,657	2 141,314
Review		
20%	14,131	4 56,526
Follow-up		
50%	7,066	2 14,131
Reporting		
	70,657	0.5 35,329
Violations		
33%	23,317	4 93,267
Return to Compliance	23,317	4 93,267
Periodic CCT		
Re-eval.	7,066	4 28,263
10%	Subtotal	462,097
		55,583
		10,430
	Total	528,110

Find-and-fix Option, with an assumed % of systems to find and fix exceedances of AL

# of system:	% to fix	# of systems required for find and fix
All systems	79,896	30% 23,969

		Hours Ea.	Total Hours
Tracking			
# of systems	23,969	2	47,938
Review			
	23,969	4	95,875
Follow-up			
25%	5,992	4	23,969
Reporting			
	23,969	0.5	11,984
Violations			
2%	479	4	1,918
Return to Compliance			
	479	4	1,918
	Total		181,684

#### Total Corrosion Control Treatment

	Standard	Default	Find-and-Fix	Std. & FF	Default & FF
Option 1	44,943	10,430	181,684	226,627	192,113
Option 2	233,263	66,013	181,684	414,946	247,696
Option 3	1,048,644	528,110	181,684	1,230,328	709,793
Option 4	254,240		181,684	435,924	

In-Line POU	115,360
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## Public Education and Transparency

	# of systems
Large systems >50,000	943
Medium 3,301-50,000	8,296
Small 25-3,300	70,657
Total number of systems	79,896

Initial tracking, review and follow-up on water systems' public education and transparency plans

Assume systems with lead service lines (11,200) will have ongoing outreach with emphasis on homeowners with LSLs

Assume systems will provide notification to customers within 24 hours of exceedance of lead action level

Assume a small percentage of systems (20%) won't complete notifications and states will have to notify

Assume systems will make information accessible to customers on results of all tap samples and WQP sampling

Large Systems	Hours Ea.	Total Hours
Tracking		
# of system	943	2 1,886
Review		
	943	4 3,772
Follow-up		
10%	94	4 377
Reporting		
	943	0.5 472
Violations		
2%	19	4 75
Return to		
Compliance	19	4 75
Periodic Plan		
Re-eval.	94	2 189
10%	Total	6,846

Medium Systems	Hours Ea.	Total Hours
Tracking		
# of system	8,296	2 16,592
Review		
	8,296	3 24,888
Follow-up		
10%	830	2 1,659
Reporting		
	8,296	0.5 4,148
Violations		
5%	415	4 1,659
Return to		
Compliance	415	4 1,659
Periodic Plan		
Re-eval.	830	1.5 1,244
10%	Subtotal	51,850

6,846  
Total 58,696

Small Systems	Hours Ea.	Total Hours
Tracking		
# of system	70,657	2 141,314
Review		
	70,657	2 141,314
Follow-up		
10%	7,066	2 14,131
Reporting		
	70,657	0.5 35,329
Violations		
10%	7,066	4 28,263
Return to		
Compliance	7,066	4 28,263
Periodic Plan		
Re-eval.	7,066	1 7,066
10%	Subtotal	395,679

51,850  
6,846  
Total 454,375

WIIN Notifications

Assume states will make 20% of WIIN Notifications

20%

Large Systems      Hours Ea.    Total Hours

Notifications

# of system    189            4            754

Medium Systems      Hours Ea.    Total Hours

Notifications

# of system    1,659            4            6,637

Small Systems      Hours Ea.    Total Hours

Notifications

# of system    14,131            4            56,526

Total            63,917

Total for Public Eduction & Transparency    518,292

## Tap Sampling

	# of systems
Large systems >50,000	943
Medium 3,301-50,000	8,296
Small 25-3,300	70,657
Total number of systems	79,896

Complex Sampling Plans  
Moderate Sampling Plans  
Simple Sampling Plans

Initial tracking, review and follow-up on sampling plans

Assume 10% of sampling plans would need to be re-evaluated periodically

Large Systems	Hours Ea.	Total Hours
Tracking		
# of systems	943	2 1,886
Review		
	943	16 15,088
Follow-up		
15%	141	4 566
Reporting		
	943	0.5 472
Violations		
2%	19	4 75
Return to Compliance		
	19	4 75
Periodic Plan		
Re-eval.	830	8 6,637
10%	Total	24,799

Medium Systems	Hours Ea.	Total Hours
Tracking		
# of systems	8,296	2 16,592
Review		
	8,296	8 66,368
Follow-up		
25%	2,074	4 8,296
Reporting		
	8,296	0.5 4,148
Violations		
20%	1,659	4 6,637
Return to Compliance		
	1,659	4 6,637
Periodic Plan		
Re-eval.	830	6 4,978
10%	Subtotal	113,655
		24,799
	Total	138,454

Small Systems	Hours Ea.	Total Hours
Tracking		
# of systems	70,657	2 141,314
Review		
	70,657	4 282,628
Follow-up		
40%	28,263	4 113,051
Reporting		
	70,657	0.5 35,329
Violations		
33%	23,317	4 93,267
Return to Compliance		
	23,317	4 93,267
Periodic Plan		
Re-eval.	7,066	3 21,197
10%	Subtotal	780,053
		113,655
		24,799
	Total	918,507

Notification(s) of household action level exceedance

Initial tracking, review and follow-up on notification plans

Assume 10% of notification plans would need to be re-evaluated periodically

Large Systems	Hours Ea.	Total Hours
Tracking		

Medium Systems	Hours Ea.	Total Hours
Tracking		

Small Systems	Hours Ea.	Total Hours
Tracking		

# of systems	943	2	1,886
Review			
	943	4	3,772
Follow-up			
25%	236	2	472
Reporting			
	943	0.5	472
Violations			
2%	19	2	38
Return to			
Compliance	19	2	38
Periodic Plan			
Re-eval.	94	2	189
10%	Total		6,865

Total Tap Sampling 1,479,457

# of systems	8,296	2	16,592
Review			
	8,296	3	24,888
Follow-up			
25%	2,074	2	4,148
Reporting			
	8,296	0.5	4,148
Violations			
20%	1,659	2	3,318
Return to			
Compliance	1,659	2	3,318
Periodic Plan			
Re-eval.	830	2	1,659
10%	Subtotal		58,072
			6,865
	Total		64,937

# of systems	70,657	2	141,314
Review			
	70,657	2	141,314
Follow-up			
50%	35,329	2	70,657
Reporting			
	70,657	0.5	35,329
Violations			
33%	23,317	2	46,634
Return to			
Compliance	23,317	2	46,634
Periodic CCT			
Re-eval.	7,066	2	14,131
10%	Subtotal		496,012
			58,072
			6,865
	Total		560,949

## Copper

Model Inputs

Model Outputs

	# of systems	Non-Corrosive	# of systems to sample for copper
Large systems >50,000	943	50%	472
Medium 3,301-50,000	8,296	50%	4,148
Small 25-3,300	70,657	50%	35,329
Total number of systems	79,896		

Initial tracking, review and follow-up on copper sampling plans

Assume the number of copper sampling sites would be half of lead sampling sites - state review time half of lead review

Assume 10% of sampling plans would need to be re-evaluated periodically

Large Systems				Medium Systems				Small Systems			
		Hours Ea.	Total Hours			Hours Ea.	Total Hours			Hours Ea.	Total Hours
Tracking				Tracking				Tracking			
# of system	472	2	943	# of systems	4,148	2	8,296	# of system	35,329	2	70,657
Review				Review				Review			
	472	12	5,658		4,148	6	24,888		35,329	2	70,657
Follow-up				Follow-up				Follow-up			
15%	71	4	283	15%	622	4	2,489	25%	8,832	4	35,329
Reporting				Reporting				Reporting			
	472	0.5	236		4,148	0.5	2,074		35,329	0.5	17,664
Violations				Violations				Violations			
2%	9	4	38	20%	830	4	3,318	33%	11,658	4	46,634
Return to				Return to				Return to			
Compliance	9	4	38	Compliance	830	4	3,318	Compliance	11,658	4	46,634
Periodic Plan				Periodic Plan				Periodic Plan			
Re-eval.	47	8	377	Re-eval.	415	6	2,489	Re-eval.	3,533	3	10,599
10%	Total		7,572	10%	Subtotal		46,872	10%	Subtotal		298,173
				Total				Total			

Initial tracking, review (simple), and follow-up for the other half of systems with non-corrosive water

Large Systems				Medium Systems				Small Systems			
		Hours Ea.	Total Hours			Hours Ea.	Total Hours			Hours Ea.	Total Hours
Tracking				Tracking				Tracking			
# of system	472	2	943	# of systems	4,148	2	8,296	# of system	35,329	2	70,657
Review				Review				Review			
	472	2	943		4,148	2	8,296		35,329	2	70,657

Follow-up			
15%	71	2	141
Reporting			
	472	0.5	236
Violations			
2%	9	2	19
Return to			
Compliance	9	2	19
Periodic Plan			
Re-eval.	47	2	94
10%	Total		2,395

Total for copper 581,487

Follow-up			
15%	622	2	1,244
Reporting			
	4,148	0.5	2,074
Violations			
5%	207	2	415
Return to			
Compliance	207	2	415
Periodic Plan			
Re-eval.	415	2	830
10%	Subtotal		21,570
			2,395
	Total		23,965

Follow-up			
25%	8,832	2	17,664
Reporting			
	35,329	0.5	17,664
Violations			
15%	5,299	2	10,599
Return to			
Compliance	5,299	2	10,599
Periodic CCT			
Re-eval.	3,533	2	7,066
10%	Subtotal		204,905
			21,570
			2,395
	Total		228,870





Association of State Drinking Water Administrators  
1401 Wilson Blvd. - Suite 1225  
Arlington, VA 22209  
Phone: (703) 812-9505  
Fax: (703) 812-9506  
Internet: [www.asdwa.org](http://www.asdwa.org)  
E-mail: [info@asdwa.org](mailto:info@asdwa.org)