Lead and Copper Monitoring and Reporting Guidance for Public Water Systems

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List of Acronyms and Abbreviations

AL	Action level
ALE	Action level exceedance
CCT	Corrosion control treatment
Cu	Copper
CWS	Community water system
EP	Entry point
GUDI	Ground water under the direct influence of surface water
HNO_3	Nitric Acid
LCR	Lead and Copper Rule
LCRMR	Lead and Copper Rule Minor Revisions
LSL	Lead service line
MCL	Maximum contaminant level
MDL	Method detection limit
MFR	Multi-family residence
mg/L	Milligrams per liter
MPL	Maximum permissible level
NTNCWS	Non-transient, non-community water system
OCCT	Optimal corrosion control treatment
OWQP	Optimal water quality parameter
Pb	Lead
ppb	Parts per billion
PQL	Practical quantitation level
PSA	Public service announcement
PWS	Public water system
QA/QC	Quality assurance/Quality control
SFR	Single family residence
SMF	Standardized monitoring framework
SOWT	Source water treatment
WQP	Water quality parameter

Lead and Copper Rule Monitoring and Reporting Guidance for Public Water Systems

CHAPTER I: INTRODUCTION

What Is the Purpose of this Guidance Document?

On June 7, 1991, the United States Environmental Protection Agency or EPA, published in the *Federal Register*, a regulation to control lead and copper in drinking water. This regulation is known as the Lead and Copper Rule (also referred to as the LCR or 1991 Rule throughout this document).

On January 12, 2000, EPA published minor revisions to the 1991 Rule. The purpose of the Lead and Copper Rule Minor Revisions (LCRMR) is to eliminate unnecessary requirements, streamline and reduce monitoring and reporting burdens, and promote consistent national implementation. In some cases, EPA has added language which clarifies requirements and corrects oversights in the original rule. EPA calls the revisions "minor" because they do not affect the lead and copper maximum contaminant level goals, action levels, or other basic regulatory requirements to monitor for lead and copper at the tap and to optimize corrosion control.

This guidance document has been developed for you, the water system owner and operator of . It provides a comprehensive discussion of the monitoring and monitoring-related reporting requirements of the LCR, as amended by the LCRMR. Some of the LCRMR provisions are clarifications to the LCR are more stringent than the LCR. These are revisions for which you and your States were required to begin implementation on April 11, 2000. Some of the revisions are less stringent than the LCR (e.g., allow a reduction in monitoring if specific criteria are met) and you may not be able to implement them because your State has chosen not to adopt these provisions or has not yet incorporated these provisions into its State's drinking water regulations. Therefore, you should first check with your State before following any of these "less stringent" provisions. For water systems on Tribal lands, or located in Wyoming or the District of Columbia, the Federal version of the entire LCRMR applies. Therefore, you were able to take advantage of the burden reduction requirements of the LCRMR on April 11, 2000.

EPA recognizes that majority of systems already have their monitoring programs underway but believes that systems will find this document useful in understanding the modifications to the monitoring and reporting requirements resulting from the LCRMR.

How Is This Document Organized?

The document contains five chapters, including this introduction and a discussion of the four monitoring protocols contained in the LCR. These chapters are listed below.

- ✰ Chapter I: Introduction
- ✰ Chapter II: Lead and Copper Tap Water Monitoring and Reporting Requirements
- ✰ Chapter III: Water Quality Parameter Monitoring and Reporting Requirements
- ✰ Chapter IV: Lead and Copper Source Water Monitoring and Reporting Requirements
- ✰ Chapter V: Lead Service Line Monitoring and Reporting Requirements

Chapter I includes a discussion of the purpose of the lead and copper regulations, and an overview of the corrosion control treatment, source water treatment, public education, and lead service line replacement requirements. Chapters II through V address the following topics:

- The purpose of the sample collection;
- Which systems are subject to the monitoring requirements;
- When, where, and how to conduct the monitoring; ow to evaluate the results;
- What happens if the system does not meet its requirements;
- Criteria that allows a system to reduce and/or eliminate its monitoring requirements;

Information that must be reported to the State;

- How the LCRMR have impacted monitoring and reporting requirements; and
- Key points to remember.

Chapter II also contains a detailed discussion on how to calculate 90th percentile levels and an explanation of monitoring requirements for systems that purchase water from another system.

Please note that parenthetical references to the Code of Federal Regulations, Chapter 40 (i.e., EPA's regulations) are included throughout the document so that system owners and operators can consult the federal regulations for further details. Note also that the term "State" is used throughout the guidance document to refer to the government agency that enforces compliance with drinking water regulations and assists you in understanding and implementing these regulations. For most systems, this is an organization within the State government (e.g., Department of Natural Resources, Department of Environmental Quality, Department of Health). For the District of Columbia, Wyoming, and Native American Lands, the contact is often from the respective EPA Regional Office.

This guidance document focuses on those revisions that impact monitoring and reporting requirements. Those revisions that are unrelated to monitoring and reporting requirements are discussed in more detail in separate guidance documents. For example, the guidance document, entitled, *Lead and Copper Rule: Summary of Revisions,* April 2000, EPA 815-R-99-020, contains a discussion of each of the

important changes made to the 1991 Rule by the LCRMR by major rule section (e.g., §141.81, §141.82, etc.), and identifies when you must begin complying with the new requirements. It also contains an appendix which compares the rule language of the LCR against the minor revisions. All available guidance documents, can be obtained by contacting the Safe Drinking Water Hotline at (800) 426-4791 or via the EPA website: www.epa.gov/safewater/leadcop.html. A list of key documents is provided as Appendix A.

Also included are five appendices to this document:

- ✰ Appendix A: List of LCRMR Outreach Materials for Water Systems.
- ✰ Appendix B: Definitions that explain the terms used in this guidance.
- ✰ Appendix C: Timelines that illustrate the schedule for corrosion control treatment (if applicable), lead and copper tap monitoring, and water quality parameters (if applicable).
- ✰ Appendix D: Summary of Monitoring and Reporting Violations.
- ✰ Appendix E: Worksheets and instructions to assist in identifying sampling sites, sample collection, and the documentation and justification of decisions.

What Is the Purpose of the Lead and Copper Regulations? (See §141.80 & §141.81(b))

The purpose of the lead and copper regulations is to protect public health by minimizing lead and copper levels in drinking water. Most regulations require sampling at entry points to the distribution system. Because lead and copper in drinking water is primarily due to the corrosion of distribution and household plumbing materials, tap water samples are collected at kitchen or bathroom taps of residences and other buildings. This requirement significantly complicates sample collection, requiring you, the water system, to coordinate with the people you serve.

What Systems Are Affected by the Lead and Copper Regulations? (See §141.80(a))

Lead and copper tap monitoring applies to all community water systems (CWSs) and non-transient, non-community water systems (NTNCWSs). The regulations divide these systems into three broad size categories (large, medium, and small). System size is a factor in determining the number of samples that must be collected, as well as the applicability and timing of some of the provisions.

Size	No. of people served
Small	25 - 3,300
Medium	3,301 - 50,000
Large	over 50,000

What Are the Requirements of the Lead and Copper Regulations? (See §§141.80-141.91)

Tap monitoring results are the primary factor for determining your ongoing monitoring requirements and whether you need to undertake any of the following treatment technique requirements:

- Corrosion control treatment;
- Source water treatment;
- Public education; and/or
- Lead service line replacement.

There is no maximum contaminant level (MCL) for lead or copper. However, if your lead and copper tap monitoring results are higher than the lead action level of 0.015 milligrams per liter (mg/l) and/or the copper action level of 1.3 mg/L, corrosion control treatment is required. To determine whether an action level has been exceeded, the value at the 90th percentile of all lead or copper samples collected is compared against its respective action level. This means that no more than 10 percent of your samples can be above either action level. An explanation of how to calculate the 90th percentile levels is provided in Chapter II.

If your 90th percentile level exceeds the lead action level of 0.015 mg/L, you must:

- Begin corrosion control treatment steps which include water quality parameter (WQP) monitoring during the same monitoring period in which the exceedance occurs;
- Conduct source water monitoring within 6 months of the exceedance and install source water treatment, if needed;
- Deliver public education within 60 days of the exceedance that informs your users about the health effects of lead and measures that will reduce their exposure to lead; and
- Replace lead service lines if you still exceed the lead action level after installing treatment.

If your 90th percentile level exceeds the copper action level of 1.3 mg/L, you must:

- Begin corrosion control treatment steps which include WQP monitoring during the same monitoring period in which the exceedance occurs; and
- Conduct source water monitoring within 6 months of the exceedance and install source water treatment, if needed.

> ✎ **Note:** Public education and lead service line replacement are not required if only the copper action level is exceeded.

A basic requirement of the lead and copper regulations is for systems to optimize corrosion control. This means that the water system is delivering water that is minimally corrosive, thereby reducing the likelihood that lead and copper will be introduced into the drinking water from the corrosion of lead and copper plumbing materials. Some systems have naturally non-corrosive water and would not benefit from installing treatment. Others installed corrosion control treatment prior to the effective

date of the original LCR (i.e., December 7, 1992). Still other systems must install corrosion control to reduce the corrosivity of their water and thereby, their lead and copper levels.

A State can deem a system to have optimized corrosion control in one of the three ways that are listed below. For some systems, this can happen without installing treatment. As discussed in more detail later in this document, systems that have optimized corrosion control have fewer monitoring and/or treatment requirements.

You can be deemed to have optimized corrosion control if:

1. You are a small or medium system (i.e., serve 50,000 or fewer people) and your 90th percentile levels are at or below both the lead and copper action levels for 2, consecutive, 6-month monitoring periods. EPA also refers to these systems as "(b)(1) systems" because they meet the requirements of §141.81(b)(1) of the federal version of the lead and copper regulations.

2. You already have treatment in place, prior to the effective date of the 1991 LCR (i.e., prior to 12/7/92) and have conducted activities equivalent to those outlined in §141.81(b)(2). EPA also refers to these systems as "(b)(2) systems ".

3. You demonstrate that the difference between the 90th percentile tap water lead level and the highest source water lead level is less than 0.005 mg/L. To make this demonstration, you must collect tap water samples for lead at the standard number of sites (see Table 2-2), and source water samples for lead at each entry point to the distribution system during each of 2, consecutive, 6-month monitoring periods. EPA also refers to these systems as "(b)(3) systems" because these criteria are specified in §141.81(b)(3) of the regulations.

4. You demonstrate that for 2, consecutive, 6-month periods your source water lead levels are below the method detection limit (MDL) ***and*** your 90th percentile lead levels are less than or equal to the practical quantitation level (PQL) of 0.005 mg/L. This ***new*** criterion was added in the LCRMR because systems with undetectable source water lead levels and low 90th percentile lead levels could be precluded from qualifying as a (b)(3) system under the 1991 LCR. This is because source water levels that are below the MDL must be reported as 0; whereas, levels above the MDL, but less than 0.005 mg/L must be reported as 0.0025 mg/L which is half the PQL. This point is more clearly illustrated in the following two examples.

Example 1: A system with source water lead levels just below a MDL of 0.001 mg/L and a 90th percentile tap level of 0.005 mg/L would not be deemed to be optimized using the 1991 LCR (b)(3) criteria, which requires the difference to be ***less than*** 0.005 mg/L. The difference here would be 0.005 mg/L, as shown in the following equation: 0.005 mg/L - 0 mg/L = 0.005 mg/L.

Example 2: With a lead MDL of 0.001 mg/L, a system with source water levels of 0.002 mg/L and a 90th percentile of 0.0050 mg/L would be optimized under the 1991 LCR criteria because the source levels could be reported as 0.0025 mg/L. The difference here would be 0.0025 mg/L, as shown in the following equation: 0.0050 mg/L - 0.0025 mg/L = 0.0025 mg/L.

✎ **Note:** The LCRMR also clarify that a (b)(3) system's 90th percentile cannot exceed the copper action level of 1.3 mg/L. The 1991 LCR did not include copper levels as part of the (b)(3) criteria. A (b)(3) system that exceeds the copper action level after July 12, 2001 (i.e., 18 months after the date of rule promulgation) will no longer qualify as a (b)(3) system. Such a system must begin corrosion control treatment steps, unless such treatment is already in place.

What Are the Corrosion Control Treatment Requirements? (See §§141.81 & 141.82)

You must conduct the corrosion control treatment steps described below if: 1) you serve more than 50,000 people and you do not qualify as a (b)(2) or (b)(3) system; or 2) you serve 50,000 or fewer people and you exceed either the lead or copper action level.

Step 1: System serving 50,000 or fewer people submit a recommendation regarding the type of corrosion control to be installed (for large systems, the recommendation is included as part of the corrosion control study referred to in Step 2).

Step 2: The State decides if systems serving 50,000 or fewer people must conduct a corrosion control study to help evaluate the most effective type of corrosion control treatment for the system. For systems serving more than 50,000 people, the study is required.

Step 3: The system submits the corrosion control study, if required.

Step 4: The State determines the type of corrosion control treatment to be installed.

Step 5 The system installs corrosion control treatment.

Step 6: The system collects follow-up lead and copper tap and WQPs after the installation of corrosion control treatment. ***Note:*** *Systems serving ≤ 50,000 people are only required to collect WQP samples if they continue to exceed the lead or copper action level.*

Step 7: The State sets WQPs ranges or minimums (called optimal water quality parameters or OWQPs) that indicate that a system is operating corrosion control treatment at a level that most effectively minimizes the lead and copper concentrations at users' taps. ***Note:*** *The State is not required to set OWQPs for systems serving ≤ 50,000 people if they are at or below the lead and copper action levels, although the State may opt to do so.*

Step 8: The system conducts periodic lead and copper tap and WQP monitoring. ***Note:*** *Systems serving ≤ 50,000 people are only required to collect WQP samples during any monitoring period in which they exceed the lead or copper action level.*

> ✎ **Notes:** Systems serving 50,000 or fewer people can discontinue these steps whenever their 90th percentile levels are at or below both action levels for 2, consecutive, 6-month monitoring periods. In addition, (b)(2) systems are not required to conduct a study, install corrosion control treatment, or conduct follow-up monitoring. The LCRMR clarify that (b)(2) systems must conduct lead and copper tap and WQP monitoring after the State sets OWQPs. Further, a system that meet the (b)(3) criteria based on initial monitoring is not subject to the corrosion control treatment requirements.

Table 1-1 shows the schedule for completing corrosion control treatment steps for those systems that are subject to these requirements.

Table 1-1: Corrosion Control Treatment Steps

Requirement	Timetable for Completing Corrosion Control Treatment for Systems Serving:	
	50,000 or fewer people[2]	**More than 50,000**
System recommends the type of treatment to be installed	6 months after the lead and/or copper action level exceedance (ALE)	N/A (Part of the corrosion control study)
State decides whether study is required	12 months after the ALE	N/A (System must conduct study)
System completes study	18 months after State decision to conduct study	July 1, 1994
State determines the type of treatment to be installed	**If study is required:** 6 months after study completed **If no study is required:** – for ≤ 3,300: 24 months after ALE – for 3,301 - 50,000: 18 months after ALE	January 1, 1995
System installs treatment	24 months after State decision regarding the type of treatment to be installed	January 1, 1997
System conducts follow-up monitoring	12 months after treatment installation (2 consecutive, 6-month periods)	January 1, 1998
State designates OWQPs[1]	6 months after follow-up monitoring	July 1, 1998
System conducts continued monitoring	The schedule based on whether an action level is exceeded and/or compliance with OWQP ranges or minimums	

Notes:
[1]The State is not required to designate OWQPs if a system no longer exceeds both action levels after installing treatment. However, some States have opted to do so.
[2]A system whose population exceeds 50,000 after July 1, 1994 must follow the schedule for medium-size systems, beginning with the requirement to complete a corrosion control study.

Form 141-C, *Optimal Corrosion Control Treatment/Water Quality Parameter*s, has been provided in Appendix E. This form can help you to document: the results of corrosion control treatment studies, your optimal corrosion control treatment recommendation, certification that optimal corrosion control

treatment has been installed, and request for modification of State decisions regarding current corrosion control treatment or WQPs. You need only complete those boxes that apply.

Lead and copper tap monitoring and WQP monitoring requirements are discussed in detail in Chapter II and III, respectively. In addition, Appendix C contains several lead and copper tap and WQP monitoring timelines that illustrate how these monitoring requirements are impacted by a system's size category and whether a system exceeds an action level.

For more information on corrosion control treatment refer to:
Lead and Copper Rule Guidance Manual, Volume II: Corrosion Control Treatment, September 1992.

What Are the Source Water Treatment Requirements? (See §141.83)

Systems that exceed the lead or copper action level are triggered into source water treatment requirements. In general, these requirements will be limited to source water monitoring. EPA anticipates that few systems have high source water lead or copper levels and will require . The SOWT steps are as follows:

Step 1: The system conducts source water monitoring at each entry point (EP) to the distribution system and submits a recommendation to the State regarding source water treatment (required of all systems that exceed the lead and/or copper action level).

Step 2: The State decides if source water treatment is needed.

Step 3: The system installs source water treatment (if required).

Step 4 The system collects follow-up lead and copper samples at the tap and at each EP (only required if treatment is installed).

Step 5: The State sets maximum permissible levels (MPLs) of lead and copper in source water (generally only specified by the State for systems installing source water treatment).

Step 6: The system conducts periodic lead and copper source water monitoring (required regardless of whether source water treatment is installed).

Table 1-2 indicates the timing of these requirements. Please note that Steps 3 through 5 only apply to those systems that are required to install .

Table 1-2: Source Water Monitoring and Treatment Requirements				
Action	**Deadline for Completing Action**		**Number of Months from ALE**	
	SOWT Required	**SOWT Not Required**	**SOWT Required**	**SOWT Not Required**
System monitors at each EP & submits recommendation	6 months after exceeding the lead and/or copper action level		6 months	
State determines if SOWT is required	6 months after receipt of results & recommendation		12 months	
System installs SOWT	24 months after State requires SOWT	N/A	36 months	N/A
System conducts follow-up monitoring	12 months after installing treatment	N/A	48 months	N/A
State sets MPLs for lead & copper[1]	Within 6 months after follow-up monitoring	N/A	54 months	N/A
System conducts routine source water monitoring [2]	Annually for surface water/combined sources		66 months	24 months
	Triennially for ground water systems		Depends on 3-yr compliance period in effect	
System conducts reduced source water monitoring [3]	Once during each 9-year compliance cycle		Depends on 9-yr compliance cycle in effect	

[1] State will set MPLs for both lead and copper even if the system exceeded only one action level.
[2] The 1st year of annual monitoring begins on the date the State set MPLs or determined that SOWT was not needed. Triennial monitoring begins with the 3-year compliance period in effect when the State set MPLs or determined that SOWT was not needed.
[3] Systems can qualify for reduced monitoring, at a frequency of once every 9-year compliance cycle, if they are in compliance with their MPLs for 3 ***consecutive*** compliance periods (i.e., 3 annual periods for surface water/combined sources; 3, 3-year periods (equals 9 years) for ground water systems).

✎ **Note:** Unlike corrosion control treatment, systems that are at or below both action levels must complete the source water treatment steps once begun. However, once the State sets MPLs or determines that source water treatment is not needed, the system is not required to collect source water samples during any source water monitoring period in which its 90th percentile lead and copper tap water levels are at or below their action levels.

Source water monitoring requirements are discussed in more detail in Chapter IV of this guidance. Detailed information regarding source water treatment is provided in *Lead and Copper Rule Guidance Manual, Volume II: Corrosion Control Treatment*, September 1992.

What Are the Public Education Requirements? (See §141.85)

If you exceed the lead action level, you must deliver public education to your customers to inform them of the health effects of lead, measures you are taking to correct the problem, and what they can do to minimize their exposure to lead. The public education requirements are different for CWSs and NTNCWSs. An overview of the requirements are provided below.

Within 60 days of exceeding the lead action level (either for the first time or again after having monitoring periods at or below the lead action level), **a CWS** must:

- Insert notices in each customer's water utility bill;
- Deliver pamphlets and/or brochures that contain the public education materials to facilities and organizations that provide services to pregnant women and children;
- Submit information to the editorial departments of the major daily and weekly newspapers circulated throughout the community; and
- Deliver public service announcements (PSAs) to radio and television stations.

A CWS must repeat delivery every 6 months for PSAs, and every 12 months for other forms of delivery, for as long as the system exceeds the lead action level.

Within 60 days of exceeding the lead action level (either for the first time or again after having monitoring periods at or below the lead action level), **an NTNCWS** must distribute public education by:

- Posting informational posters in public places or in common areas of buildings served by the system; and
- Distributing informational pamphlets and/or brochures to each person served by the NTNCWSs.

An NTNCWS must repeat this information annually for as long as it exceeds the lead action level.

Any system can stop delivering public education whenever its 90th percentile lead level is at or below the action level for ***one monitoring period***. If it again exceeds the lead action level, it must recommence public education within 60 days of the exceedance.

✎ ***Please note, the LCRMR offer some flexibility in making revisions to the mandatory public education language and the distribution of public education materials.***

For more information on public education, refer to the updated guidance: *Lead in Drinking Water Regulation: Public Education Guidance*, EPA 816-R-02-010.

What Are the Lead Service Line Replacement Requirements? (See §141.84)

If treatment is not effective in reducing lead levels, systems with lead service lines must replace at least 7 percent of their lines annually (the State can require a higher rate). The State can also require systems to begin lead service line replacement if they do not meet their deadline for installing corrosion control or source water treatment. Systems can discontinue lead service line replacement if they are at or below the lead action level for ***2 consecutive monitoring periods***.

The monitoring requirements that are associated with lead service line replacement are discussed in Chapter V. A detailed discussion of the lead service line replacement requirements is provided in *Lead and Copper Rule Guidance Manual, Volume II: Corrosion Control Treatment*, September 1992.

CHAPTER II: LEAD AND COPPER TAP MONITORING AND REPORTING REQUIREMENTS

What Is The Purpose of Collecting Lead and Copper Tap Samples?

The tap water monitoring protocol for lead and copper is designed to identify those residences or sampling locations with lead service lines, lead interior plumbing, or copper pipes with lead solder. Samples collected from these locations are most likely to have high levels of lead and/or copper caused by the contact of corrosive water with lead- and copper-containing plumbing materials. You are required to monitor at these "high-risk" locations, whenever possible (versus collecting a random sample) to better ensure that high levels of lead or copper are detected and that you institute treatment that provides uniform and adequate levels of health protection throughout the distribution system. Tap water monitoring for lead and copper not only allows you to determine the lead and copper concentrations in drinking water, but if you have installed treatment, monitoring allows you to assess the effectiveness of corrosion control treatment and/or source water treatment.

Is My System Required to Collect Lead and Copper Tap Samples? (See §§140.80(a) & 141.86(c)&(d))

All CWSs and NTNCWSs must collect lead and copper tap samples. Transient, non-community water systems are not subject to the lead and copper regulations. The frequency of the monitoring and number of samples to be collected and analyzed is based primarily on how many people you serve and your tap water monitoring results.

When Do I Collect Lead and Copper Tap Samples? (See §§141.86(c) & (d))

Lead and copper monitoring can be divided into four phases:

- **Initial monitoring** that is required of all systems.
- **Follow-up monitoring** that corresponds to the 2, consecutive 6-month periods after a system completes the installation of corrosion control and is only required for systems that install treatment.
- **Routine monitoring** applies both to systems that are required to install treatment and to (b)(2) systems. For these systems, this monitoring occurs after the State sets OWQPs.
- **Reduced monitoring** corresponds to monitoring that occurs at a reduced frequency and a reduced number of sample locations. This reduction is based on a system's lead and copper 90th percentile levels or compliance with OWQPs.

Each type of monitoring is discussed in greater detail below. In addition, refer to the monitoring timelines in Appendix C which help illustrate how lead and copper tap monitoring requirements are impacted by a system's size category and whether the system exceeds an action level.

Initial Lead and Copper Tap Monitoring

The LCR specifies dates by which you were required to begin monitoring. The date was dependent on the number of people that you served as shown in Table 2-1 below, and was specified for discrete 6-month monitoring periods of January through June and July through December.

Table 2-1: Schedule for Initial Monitoring[1]

System Size (No. of People Served)	1st Initial Monitoring Period	2nd Initial Monitoring Period
3,300 and under	7/1/93 - 12/31/93	1/1/94 - 6/30/94[2]
3,301 - 50,000	7/1/92 - 12/31/92	1/1/93 - 6/30/93[2]
50,001 and more	1/1/92 - 6/30/92	7/1/92 - 12/31/92

✎ **NOTES:**
[1]If you are a new system, consult with your State LCR Coordinator to find out when you should begin lead and copper monitoring.
[2]Required if you do not exceed either action level during the 1st initial monitoring period, or if your State specifies that you must conduct this monitoring.

If you serve more than 50,000 people, you were required to conduct **both** 6-month rounds of initial lead and copper tap monitoring at the standard number of sites, required for your system size (see Table 2-2).

If you serve 50,000 or fewer people, you were required to conduct a minimum of **one**, 6-month round of initial monitoring at the standard number of sites (see Table 2-2). The requirement for you to conduct a second round of initial lead and copper tap monitoring was based on your 90th percentile lead and copper levels during the first round of monitoring as follows:

- You were not required to collect a second round of initial monitoring if you exceeded the lead or copper action level (unless required by your State). Instead, you were triggered into corrosion control treatment steps (refer back to the corrosion control treatment discussion in Chapter I). You also had the option to continue lead and copper tap monitoring while conducting corrosion control treatment steps to determine if you were eligible to stop these steps (i.e., you had 2, consecutive, 6-month periods in which your 90th percentile lead and copper levels were at or below their respective action levels).

Table 2-2: Minimum Number of Lead and Copper Tap Samples for Systems on Standard Monitoring

System Size	No. of Samples
> 100,000	100
10,001 - 100,000	60
3,301 - 10,000	40
501 - 3,300	20
101 - 500	10
≤ 100	5

✎ **Note:** If you are triggered into corrosion control treatment requirements, some lead and copper tap monitoring will be needed to evaluate the type of corrosion control to be installed and/or fine-tune your treatment. These samples are not part of your monitoring requirements. However, some States may require systems to submit these data for compliance purposes. In this event, the lead and copper samples must be used by systems and States in calculating 90th percentile levels *[See §141.86(e)]*.

- You were required to conduct a second round of initial monitoring during the next 6 months, if you were at or below the lead and copper action levels during the first round of monitoring.

✎ **Note:** If you serve 50,000 or fewer people and never exceed an action level, you only have to conduct periodic lead and copper tap monitoring.

~ No other requirements apply to you ~

Follow-up Lead and Copper Tap Monitoring

If you are required to install corrosion control treatment, you must conduct 2, consecutive, 6-month rounds of follow-up lead and copper tap monitoring at the standard number of sites. If you serve more than 50,000 people and you did not meet either the (b)(2) or (b)(3) criteria, this monitoring was required to be conducted by January 1, 1998. If you serve 50,000 or fewer people, this monitoring must be completed within one year of installing corrosion control treatment.

Routine Lead and Copper Tap Monitoring

If you serve more than 50,000 people and you do meet the (b)(3) criteria, you must monitor semi-annually at the standard number of sites until you qualify for reduced monitoring by being in compliance with your OWQP specifications for 2, consecutive, 6-month monitoring periods.

If you serve 50,000 or fewer people and you continue to exceed either action level after installing corrosion control treatment, you must monitor semi-annually at the standard number of sites until you qualify for reduced monitoring by being in compliance with your OWQP specifications for 2, consecutive, 6-month monitoring periods.

Am I Eligible for Reduced Lead and Copper Tap Monitoring? (See §§141.86(d)(4) & (g))

Reduced Lead and Copper Tap Monitoring

Criteria for Annual Monitoring: You can reduce the frequency of your monitoring to annually and collect from a reduced number of sites, as shown in Table 2-3, if:

1. You serve 50,000 or fewer people, and you are at or below both action levels during 2, consecutive, 6-month monitoring periods. The earliest that you could qualify for reduced monitoring is after initial monitoring. You do not need prior approval from the State.

OR

2. For any size system, you operate in accordance with State-specified OWQPs during 2, consecutive, 6-month monitoring periods. ***The LCRMR*** *no longer require you to request reduced monitoring status from the State. However, you must receive written permission to proceed to reduced monitoring.*

Table 2-3: Minimum Number of Lead and Copper Tap Samples for Systems on Reduced Monitoring

System Size	No. of Samples
> 100,000	50
10,001 - 100,00	30
3,301 - 10,000	20
501 - 3,300	10
101 - 500	5
≤ 100	5

Note: The number of samples for systems serving ≤ 100 people is the same under standard and reduced monitoring.

REMEMBER: If you do not have the required number of sampling sites, it may be necessary to collect more than one sample from the same location, on different days, in order to collect the minimum number of required samples.

Criteria for Triennial Monitoring: You can reduce the frequency of sampling to once every 3 years and collect the reduced number of samples if you are:

1. A system that serves 50,000 or fewer people and your 90th percentile lead and copper levels are at or below both action levels for 3 consecutive years. *You do not need prior approval from the State).* Two, consecutive, 6-month periods at or below both action levels (such as the two initial monitoring periods) can count as the first year of the 3 years needed to qualify for triennial monitoring.

2. Any size system that operates in accordance with State-specified OWQPs during, 3 consecutive years, even if you exceed one or both action levels. *You must receive written permission to proceed to reduced monitoring.*

3. Any size system that demonstrates that it meets the (b)(3) criteria. The LCRMR clarify that (b)(3) systems must conduct one round of monitoring at the reduced number of sites between September 1, 1997 and September 30, 2000 and collect lead and copper tap samples at least once every 3 calendar years, thereafter *(Note: Some States may not allow triennial monitoring for certain size systems)*. If you no longer meet the (b)(3) criteria for any of the following reasons, you must begin corrosion control treatment steps, beginning with the study:

    - The difference between your 90th percentile lead level at the tap and the lead level in your source water is 0.005 mg/L or higher; or
    - You exceed the lead action level; or
    - You exceed the copper action level on or after July 12, 2001.

4. Any size system with 90th percentile lead levels of less than or equal to 0.005 mg/L and 90th percentile copper levels of less than or equal to 0.65 mg/L, for 2, consecutive, 6-month periods (also known as accelerated reduced lead and copper tap monitoring). This provision is newly allowed under the LCRMR and is less stringent than the original LCR. ✓*You must first check with your State to determine if it has adopted this provision.*

Criteria for a Monitoring Waiver: Under the LCRMR, if you serve 3,300 or fewer people, you may be eligible for a lead and/or copper monitoring waiver, that allows you to collect lead and copper samples at 9-year intervals at the reduced number of sites if you meet specific materials and monitoring criteria.

- To meet the materials criteria for lead, you must certify that the plumbing materials in your system contain no plastic pipes which contain lead plasticizers, or plastic service lines which contain lead plasticizers, and are free of lead service lines, lead pipes, lead soldered pipe joints, and leaded brass or bronze alloy fittings and fixtures, unless the fittings and fixtures meet the specifications of any standard established by SDWA section 1417(e). To meet the materials criteria for copper, you must certify that the plumbing materials in your system do not contain any copper pipes or copper service lines.

- The monitoring criteria specify that your 90th percentile lead level cannot be greater than 0.005 mg/L and your 90th percentile copper level cannot be higher than 0.65 mg/L.

Full waivers may be granted if you meet the materials and monitoring criteria for both lead and copper. Partial waivers for lead or copper may be granted if you demonstrate to the State that you meet the materials and monitoring criteria for either lead or copper, but not both. States may elect not to grant full or partial monitoring waivers. *Note: Some States are not planning on adopting this waiver provision.*

A few States granted waivers prior to the April 11, 2000, effective date of the LCRMR. If you were granted a "pre-existing waiver" and were not required to monitor, the LCRMR specify that you had to conduct at least one set of lead and copper samples at the tap at the standard number of sites by September 30, 2000.

For more information on monitoring waivers, refer to: *Monitoring Waivers under the Lead and Copper Rule Minor Revisions for Systems Serving 3,300 or Fewer People,* April 2000, EPA 815-R-99-021.

Table 2-4 below summarizes the criteria that you must meet to qualify for reduced monitoring. For systems serving more than 100 people, monitoring is conducted at a reduced number of sites.

Table 2-4: Reduced Lead and Copper Tap Monitoring Criteria

System Size (No. of people served)	Criteria	Monitoring Frequency
50,000 and fewer	At or below both action levels for 2 consecutive 6-month monitoring periods.	Annual
Any size	Meet OWQP specifications for 2 consecutive 6-month monitoring periods.	
50,000 and fewer	At or below both action levels for 3 consecutive years of monitoring.	Triennial
Any size	Meet OWQP specifications for 3 consecutive years of monitoring.	
Any size	90th percentile lead level is ≤ 0.005 mg/L and 90th percentile copper level is ≤ 0.65 mg/L for 2, consecutive, 6-month periods. ✎*Note: This is newly allowed under the LCRMR and the State must adopt it before it can be implemented.*	
Any size	Meet (b)(3) criteria: 1. the 90th percentile lead level minus the highest source water level is < 0.005 mg/L for 2 consecutive, 6-month monitoring periods. ***or*** 2. source water lead levels are below the MDL *and* the 90th percentile lead level is ≤ 0.005 mg/L for 2 consecutive, 6-month monitoring periods. ***and*** 3. after July 12, 2001, 90th percentile copper levels are at or below the copper action level.	
25 to 3,300	Meet monitoring waiver criteria: 1. 90th percentile levels are ≤ 0.005 mg/L for lead and/or ≤ 0.65 mg/L for copper. ***and*** 2. plumbing materials meet certain criteria that indicate negligible risk from lead and/or copper exposure. ***and*** 3. waiver is approved by the State.	Once every 9 years

Note: 2 consecutive, 6-months at or below both action levels can count as the first year of the 3 years needed to qualify for triennial monitoring.

Under the LCR, you were required to conduct reduced lead and copper tap monitoring (i.e., annual or triennial monitoring) during the months of June through September. Under the LCRMR, the State may

require you to collect your tap samples during months other than June through September, if it believes that another time period better represents a time of normal operation where the highest lead levels are likely to occur (e.g., seasonal system that is closed during the summer months). The LCRMR specify a one-time ***transition period*** for switching to the new monitoring period, including systems granted monitoring waivers.

If you monitor:	***Then the next round of samples is due no later than:***
Annually	21 months after the previous round
Triennially	45 months after the previous round
Every 9 years	The end of the 9-year cycle

For example, assume a system is on annual monitoring and last sampled on July 7, 2001. The system is typically closed during the summer months and the State requires the system to collect its samples during October through December. The LCRMR allow a ***maximum*** of 21 months for a system on annual monitoring to transition to the new monitoring schedule or April 7, 2003 in this example. However, since this system must collect its samples during October through November, it only has until December 31, 2002 to complete this monitoring (a little under 18 months).

Where Must I Collect My Samples? (See §141.86(a))

The lead and copper regulations require you to sample at locations that may be particularly susceptible to high lead or copper concentrations. The LCR establishes a tiering system for prioritizing sampling sites. A materials evaluation is required to help classify sampling sites into tiers. You must perform a materials evaluation before you begin lead and copper tap monitoring (refer back to Table 2-1). Table 2-5, below, defines the tiering system for prioritizing sampling sites.

Table 2-5: Tiering Classification	
If you are a CWS	***If you are an NTNCWS***
Tier 1 sampling sites are single family structures: ▪ with copper pipes with lead solder installed after 1982 *(but before the effective date of your State's lead ban)* or contain lead pipes; and/or ▪ that are served by a lead service line. ✎ **Note:** When multiple-family residences (MFRs) comprise at least 20% of the structures served by a water system, the system may count them as Tier 1 sites.	**Tier 1** sampling sites consist of buildings: ▪ with copper pipes with lead solder installed after 1982 *(but before the effective date of your State's lead ban)* or contain lead pipes; and/or ▪ that are served by a lead service line.
Tier 2 sampling sites consist of buildings, including MFRs: ▪ with copper pipes with lead solder installed after 1982 *(but before effective date of your State's lead ban)* or contain lead pipes; and/or ▪ that are served by a lead service line. **Tier 3** sampling sites are single family structures w/ copper pipes having lead solder installed before 1983.	**Tier 2** sampling sites consist of buildings with copper pipes with lead solder installed before 1983. **Tier 3**: Not applicable.
✎ **Note:** All States were required to ban the use of lead solder in all public water systems, and all homes and buildings connected to such systems by June 1988 (most States adopted the ban in 1987 or 1988). Contact the Drinking Water Program in your State to find out the effective date.	

Once monitoring begins, you must use the same sites, unless a site is no longer accessible to you or no longer fits the requirements of a priority site (e.g., the lead service lines that served the site have been).

The LCRMR specify that sites that are chosen for reduced monitoring (i.e., monitoring that is conducted at a 1-year, 3-year, or 9-year frequency) must be representative of those sites that were used during standard monitoring. The LCR did not contain language regarding which sites should be used for reduced monitoring. You may wish to randomly select the reduced number of sites from the larger pool used during standard monitoring. The intent of the rule is that you do not use only those sampling locations with the lowest lead or copper levels. The revised rule also gives States the choice to determine which sample locations you must use. Before proceeding, check with your State to find out what method the State uses in selecting reduced monitoring sampling sites.

Sources of Information That You Should Review

To identify enough sites that meet targeting criteria, you should survey all records documenting the materials used to construct and repair your distribution system and buildings connected to your distribution system. Relevant information can be attained through the following sources:

- Plumbing Codes;
- Plumbing Permits;

- Distribution Maps and Drawings;
- Inspection and Maintenance Records;
- Meter Installation Records;
- Capital Improvement and Master Plans;
- Standard Operating Procedures;
- Operation and Maintenance Manuals;
- Permit Files;
- Existing Water Quality Data;
- Interviews with Senior Personnel, Building Inspectors, and Retirees; and
- Community Survey.

EPA recommends that you identify more sampling sites than the number of samples you are required to collect during each monitoring period, in case volunteers drop out. The regulations specify the minimum number of tap samples that you must collect each monitoring period, as are shown in Tables 2-2 and 2-3. For example, if you serve 3,301 to 10,000 people, you are required to collect 40 tap water samples during each of (at least) 2, consecutive, 6-month monitoring periods. You should try to maintain a list of about 60 to 80 sampling sites that meet the Tier 1 targeting criteria. If you cannot identify 60 to 80 sites meeting the Tier 1 targeting criteria, then you should complete your list with sites meeting Tier 2 criteria, followed by those meeting Tier 3 criteria (for CWSs only). If you do not have enough Tier 1, 2, and 3 sites, the LCRMR clarify that you must complete your sampling pool with representative sites. A site is representative if its plumbing is similar to that of other sites in your system. EPA encourages you to use sites with copper plumbing installed subsequent to the local implementation if the lead ban (typically 1988 or 1989), provided these sites can be considered representative.

If your system contains lead service lines, then, if possible, half of the required sampling sites should be served by a lead service line. Using the medium system example: your sampling plan should include 20 sites that are served by a lead service line, and you should try to maintain a list of about 30 to 40 sampling sites served by lead service lines to ensure access to enough sites.

The preamble of the LCRMR (see page 1970) also clarifies that you may need to collect more than one sample from the same location, on different days, in order to meet your minimum sampling requirements. For example, if you are required to collect a minimum of five samples, but you only have one sampling site, you must collect five samples from this sampling site on different days.

Three worksheets for organizing the information collected during the materials evaluation are included in Appendix E as follows:

- Worksheet 1: Materials Survey Investigation Results
- Worksheet 2: Materials Survey Results by Number of Service Connections for each Plumbing Materials Type
- Worksheet 3: Summary of Material Survey Results

These worksheets can help you determine the sites that contain the highest priority materials. You do not have to send them to the State, unless requested. In addition, you may want to conduct some site surveys to be sure you have identified sites with lead.

<u>If You Cannot Find Enough Sampling Sites with High Risk</u>

If you are unable to collect all your samples from Tier 1 sites, then you must follow the procedures discussed below:

- When a sufficient number of Tier 1 sites do not exist or are inaccessible, you should complete your sampling pool with Tier 2 sites.
- For CWSs, when a sufficient number of Tier 1 and 2 sites do not exist or are inaccessible, you should complete your sampling pool with Tier 3 sites.
- According to the LCRMR, any water system that cannot complete its sampling at sites that meet the applicable tiering criteria must complete sampling at representative sites throughout the distribution system.
- You are not required to target buildings with lead solder installed after the effective date that the lead ban was adopted in your State.
- You should not monitor at sampling sites that have water softeners; however, if all of your available sampling sites have water softeners, you should identify the highest risk sites (Tier 1) and monitor at those locations (such as a kitchen or bathroom tap).
- If you are not able to draw at least half of your samples from taps served by lead service lines, you must collect a sample from each site that is served by a lead service line.

  For example, a system serving 3,301 to 10,000 people does not qualify for reduced monitoring and is required to collect tap water samples from a total of 40 sites, 20 of which must be from sites served by a lead service line. If, after reviewing all of the records listed on the previous page, the system can identify only 12 sites served by a lead service line, it must collect a tap water sample from each of those sites. The remaining 28 samples would be collected from other Tier 1 sites. If an insufficient number of Tier 1 sites are available, the system must use Tier 2 sites, followed by Tier 3 sites, and lastly by representative sites. *Refer back to Tables 2-2 (standard monitoring) and 2-3 (reduced monitoring) to identify the appropriate number of sites for your system size.*

- If you have no lead service lines, but you have lead goosenecks or pigtails, you can collect tap water samples at the sites with the goosenecks and/or pigtails.

How Do I Collect Lead and Copper Tap Water Samples? (See §141.86(b))

When collecting lead and copper tap samples, you must follow the procedures listed below:

- Always collect a 1-liter sample in one container only (e.g., do not split the sample between two containers).
- Always collect a first-draw sample from a tap where the water has stood in the pipes for at least 6 hours (e.g., no flushing, showering, etc.), *except where noted below in the box titled: "Related LCRMR Provisions"*. However, make sure it is a tap that is used regularly, and not an abandoned or infrequently used tap.

- First-draw samples collected at single-family residences should always be drawn from the cold-water kitchen tap or bathroom tap.
- First-draw samples collected from buildings other than single-family homes should always be drawn from an interior tap from which water is typically taken for consumption.
- You may allow residents to collect sample, but you must supply the residents with instructions as to the sample collection procedures. You can use the instruction form provided as page E-5 of Appendix E. Be sure to properly label sample bottles prior to distributing them to residents.
- As a general rule, you should collect your lead and copper tap water samples early in the monitoring period in case you exceed the lead or copper action level. This is because you will be required to also collect WQP samples during the same monitoring period (refer to Chapter III for a more detailed discussion of WQP monitoring).
- After the sample is drawn, acidification of the sample should be completed by the laboratory personnel upon receipt of the sample, but in no case later than 14 days after sample collection. Neither the homeowner nor the sample collector should handle the nitric acid used for sample acidification.
- If you cannot gain access to an original sampling site during any repeat sample collections, you should collect a tap water sample from another site which meets the same targeting criteria as the original site. The replacement site should be located within reasonable proximity of the original site. *(Note: Some States require prior notification or approval of any changes in sampling sites.)* Form 141-A in Appendix E provides you with an easy-to-follow format for tracking sample site identification and certification.

Related LCRMR Provision

If you are an NTNCWS or CWS (such as a prison or hospital) that does not have enough inside taps where the water stands unused for at least 6 hours, the LCRMR allow you to use inside taps that are the most likely to have remained unused for the longest period of time. Your State contact will tell you whether you must submit a sampling plan for State approval prior to sampling at non-first-draw sample locations or if you can proceed with sampling and submit the plan with your sampling results.

✓ ***Please check with your State before collecting any non-first draw samples.***

What Are the Approved Methods for Analyzing Water Samples for Lead and Copper? (See §141.23(l))

The approved analytical methods for lead, copper, and all WQPs (pH, calcium, alkalinity, silica, orthophosphate, conductivity, and temperature) are shown in Table 2-6. A summary of the preservation protocols, sample containers, and maximum holding times for analysis is provided in Table 2-7.

Table 2-6: Approved Analytical Methods for the Lead and Copper Rule				
Contaminant	**Methodology [8]**			
	EPA	**ASTM[3]**	**SM[4]**	**Other**
Alkalinity				
Titrimetric		D1067-92B	2320 B	
Electrometric titration				I-1030-85[5]
Calcium				
EDTA titrimetric		D511-93A	3500-Ca D	
Atomic absorption; direct aspiration		D511-93B	3111 B	
Inductively-coupled plasma[2]	200.7		3120 B	
Copper				
Atomic absorption; furnace		D1688-95C	3113 B	
Atomic absorption; direct aspiration		D1688-95A	3111 B	
Inductively Coupled Plasma (ICP)[2]	200.7		3120 B	
ICP-Mass spectrometry[2]	200.8			
Atomic absorption; platform[2]	200.9			
Conductivity Conductance		D1125-95A	2510 B	
Lead				
Atomic absorption; furnace		D3559-95D	3113 B	
ICP-Mass spectrometry[2]	200.8			
Atomic absorption; platform[2]	200.9			
Differential pulse anodic stripping voltammetry				Method 1001[9]
Orthophosphate[7]				
Colorimetric, automated, ascorbic acid[6]	365.1		4500-P F	
Colorimetric, ascorbic acid, single reagent		D515-88A	4500-P E	
Colorimetric, phosphomolybdate;				I-1602-85[5]
Colorimetric, automated-segmented flow				I-2601-90[5]
Colorimetric, automated discrete				I-2598-85[5]
Ion Chromatography[6]	300.0	D4327-91	4110 B	
pH				
Electrometric[1]	150.1, 150.2	D1293-95	4500-H^+B	
Silica				
Colorimetric: molybdate blue				I-1700-85
Colorimetric: automated-seg. flow				I-2700-85

Table 2-6: Approved Analytical Methods for the Lead and Copper Rule				
Contaminant	**Methodology [8]**			
	EPA	**ASTM[3]**	**SM[4]**	**Other**
Colorimetric		D859-95		
Colorimetric: molybdosilicate			4500-Si D	
Colorimetric: heteropoly blue			4500-Si E	
Colorimetric: automated method for molybdate-reactive silica			4500-Si F	
Colorimetric: inductively-coupled plasma	200.7		3120 B	
Temperature				
Thermometric			2550	

Notes

[1] "Methods for Chemical Analysis of Water and Wastes", EPA/600/4-79/020, March 1983. Available at NTIS, PB84-128677.

[2] "Methods for the Determination of Metals in Environmental Samples—Supplement I", EPA/600/R-94/111, May 1994. Available at NTIS, PB95-125472.

[3] Annual Book of ASTM Standards, 1994 and 1996, Vols. 11.01 and 11.02, American Society for Testing and Materials. The previous versions of D1688-95A, D1688-95C (copper), D3559-95D (lead), D1293-95 (pH), D1125-91A (conductivity) and D859-94 (silica) are also approved. These previous versions D1688-90A, C; D3559-90D, D1293-84, D1125-91A and D859-88, respectively are located in the Annual Book of ASTM Standards, 1994, Vols. 11.01. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

[4] 18th and 19th editions of Standard Methods for the Examination of Water and Wastewater, 1992 and 1995, respectively, American Public Health Association; either edition may be used. Copies may be obtained from the American Public Health Asso-ciation, 1015 Fifteenth Street NW, Washington, DC 20005.

[5] Method I-2601-90, Methods for Analysis by the U.S. Geological Survey National Water Quality Laboratory Determination of Inorganic and Organic Constituents in Water and Fluvial Sediments, Open File Report 93-125, 1993; For Methods I-1030-85; I-1601-85; I-1700-85; I-2598-85; I-2700-85; and I-3300-85 See Techniques of Water Resources Investigation of the U.S. Geological Survey, Book 5, Chapter A-1, 3rd ed., 1989; Available from Information Services, U.S. Geological Survey, Federal Center, Box 25286, Denver, CO 80225-0425.

[6] "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA/600/R-93/100, August 1993. Available at NTIS, PB94-120821.

[7] Unfiltered, no digestion or hydolysis.

[8] Because MDLs reported in EPA Methods 200.7 and 200.9 were determined using a 2X preconcentration step during sample digestion, MDLs determined when samples are analyzed by direct analysis (i.e., no sample digestion) will be higher. For direct analysis of cadmium and arsenic by Method 200.7, and arsenic by Method 3120 B sample preconcentration using pneumatic nebulization may be required to achieve lower detection limits. Preconcentration may also be required for direct analysis of antimony, lead, and thallium by Method 200.9; antimony and lead by Method 3113 B; and lead by Method D3559-90D unless multiple in-furnace depositions are made.

[9] The description for Method Number 1001 for lead is available from Palintest, LTD, 21 Kenton Lands Road, P.O. Box 18395, Erlanger, KY 41018. Or from the Hach Company, P.O. Box 389, Loveland, CO 8053.

Laboratory certification will only be required for lead and copper analyses, and is based on the performance requirements included with the method detection limits. The use of the approved analytical methods for all of the WQPs as well as lead and copper is necessary to assure consistent results and high quality data. However, sample collection and analysis procedures in the field can contribute to errors in measurement. A quality assurance/quality control (QA/QC) program for field sampling/analysis and laboratory analysis should be developed and implemented by all water systems.

If a commercial or State laboratory performs the laboratory analyses, it is still important that quality control measures be taken for the field sampling portion of the monitoring program.

A complete QA/QC program should contain components at each step in the data collection process, including sample collection and methods, laboratory sample handling and analysis, and recording/reporting of the results. An important element in implementing a successful QA/QC program is the ability to properly track a sample from its collection through analysis and ultimate recording in either the State or your database. The QA/QC program requirements for sample tracking include: (1) sample identification; (2) complete sample labeling; (3) training sample collectors and field data collectors; (4) parallel construction of laboratory record keeping and database format to sample labeling and identification; and, (5) periodic self-audits of the QA/QC procedures.

Significant benefits could be gained by the implementation of a program to properly label and identify samples to track their collection, analysis, and results. Minimally, the data fields (i.e., variables defined within the laboratory and/or your database) needed to fully identify a sample are:

1. Water System Identification Number.
2. Applicable Water System Entry Point Identification Numbers. (There may be multiple entry points to a distribution system which should be identified for each sample collected within it.)
3. Sample Identification Number.
4. Sample Type Identifier: (2 Fields)
    a. First-draw tap, Distribution system, Source water for lead and copper, Source water for WQPs, or Lead service line.
    b. Initial, Follow-Up, Routine, Reduced, or Lead Service Line.
5. Sample Site Identifier: (3 Fields)
    a. Region of Distribution System. (Suggest that Region 0 be assigned for each entry point location.)
    b. Subregion of Distribution System. (Suggest that Subregion 0 be assigned for each entry point location.)
    c. Sample Site Specific Identifier.
6. Sample Collection Date.
7. Sample Collection Time.
8. Sample Period.
9. Sample Collector Identifier: Public Water System (PWS) Staff, Resident, State, or Other.
10. Parameters for Analysis: Lead, Copper, Water Quality Parameters or pH and Temperature (field measurements).
11. Sample Site Street Address - for water system use.
12. Sample Collection Route - for water system use.
13. Water system Name.
14. Water system Contact Person and telephone number.

You should include data fields to identify those samples delivered to the laboratory representing travel blanks and blind spikes. As part of your routine QA/QC program for analytical results, travel blanks should be included in at least 10 percent of the sampling kits delivered to and returned from homeowners performing tap monitoring. Additionally, for lead and copper analyses, at least three blind spike samples should be included during every 6-month monitoring period for medium and large water systems, and at least one such sample for small water systems.

Table 2-7: Sample Handling Requirements for Lead, Copper, and Water Quality Parameters			
Contaminant or Parameters	**Preservative**	**Container[1]**	**Maximum Holding Time[2]**
Lead	Conc. HNO_3 to pH <2[3]	P or G	6 months
Copper	Conc. HNO_3 to pH <2[3]	P or G	6 months
pH	None	P or G	Test Immediately[4]
Conductivity	Cool, 4°C	P or G	28 days
Calcium	Conc. HNO_3 to pH <2[5]	P or G	6 months
Alkalinity	Cool, 4°C	P or G	14 days
Orthophosphate	Cool, 4°C	P or G	48 hours
Silica	Cool, 4°C	P only	28 days
Temperature	None	P or G	Test Immediately[4]

1 P = Plastic, hard or soft; G = Glass, hard or soft.

2 In all cases, samples should be analyzed as soon after collection as possible.

3 If nitric acid (HNO_3) cannot be used because of shipping restrictions or is not used because homeowners are collecting samples, the sample for analysis can be shipped to a laboratory where it must be acidified (generally to pH < 2) with concentrated HNO_3 as soon as possible but not later than 14 days after sample collection. Sample must stand in the original container used for sampling for at least 28 hours after acidification. Laboratories should match the acid matrix of their samples, quality control, and calibration standards for accurate results. The latter two sets of solutions will have the same, fixed concentration of acid. It is recommended that good laboratory practice would be to determine by prior tests the amount of acid necessary to achieve some pH <2, and make it consistent with the standards used. For instance, for most waters, the previous EPA recommendation of 0.15% v/v of HNO_3 will result in a pH < 2. Therefore, all samples can be automatically preserved with 1.5 mL of the acid, and all standards can be made with the same acid concentration. In some extreme, high-alkalinity cases, more acid may be necessary.

4 "Test Immediately" generally means within 15 minutes of sample collection. In the case of pH, the sample should be measured as soon as the sample is taken and should be measured under closed system conditions, particularly if the water is poorly buffered.

5 If HNO_3 cannot be used because of shipping restrictions or safety concerns for sampling personnel, the sample for analysis may be initially preserved by icing and immediately shipping it to the laboratory. Upon receipt in the laboratory, the sample must be acidified with concentrated HNO_3 to pH < 2.

How Do I Evaluate My Results? (See §§141.80(c)(3) & 141.86(f))

Lead and copper analytical results are evaluated against an action level, not an MCL. The lead action level is exceeded if the concentration of lead in more than 10 percent of tap water samples collected during any monitoring period is greater than 0.015 mg/L (i.e., if the 90th percentile level lead level is greater than 0.015 mg/L). The copper action level is exceeded if the concentration of copper in more than 10 percent of tap water samples collected during any monitoring period conducted is greater than 1.3 mg/L (i.e., if the 90th percentile level copper level is greater than 1.3 mg/L). All samples that meet the proper site selection and sample collection procedures are used to determine the 90th percentile calculation, even if you collect samples from more sites than required.

The 90th percentile is calculated separately for lead and copper. The procedure for determining the lead 90th percentile value is as follows:

If you are required to collect more than 5 samples:

Step 1: Place ***lead*** results in ascending order (from lowest to highest value).

Step 2: Assign each sample a number, 1 for lowest value.

Step 3: Multiply the total number of samples by 0.9.

Step 4: Compare the 90th percentile level to the action level of 0.015 mg/L(i.e., 15 parts per billion (ppb)). If your 90th percentile value is higher than 0.015 mg/L, you have an exceedance.

*Repeat this procedure for **copper** sample results, except compare the 90th percentile copper level against its action level of 1.3 mg/L. If your 90th percentile value is greater than 1.3 mg/L, you have an exceedance.*

If you are required to collect 5 samples:

Step 1: Place lead or copper results in ascending order.

Step 2: Take the average of the 4th and 5th highest sample. This is your 90th percentile level.

Step 3: Compare the 90th percentile level against the lead or copper action level.

REMEMBER: All sample results taken during the monitoring period must be included in your 90th percentile calculations, unless a result has been invalidated (refer to the section in this chapter, entitled, What If The State Determines That My Samples Are Invalid?). If a sample is invalidated, its replacement sample must be included in the 90th percentile calculation. Further, a 90th percentile level cannot be calculated if the system has collected less than the minimum required number of samples.
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Below are two examples to help demonstrate the 90th percentile calculation for systems that are required to collect more than 5 samples. The first example explains how to determine whether you have exceeded an action level when your 90th percentile level is a whole number. The second example shows how to make this determination, using either rounding or interpolation, when your 90th percentile level contains a decimal. This may happen when you collect more than the minimum required number of samples.

Example 1: Determining Whether An Action Level Has Been Exceeded When the 90th Percentile Level is A Whole Number	
Sample Rank	**Sample Value** (mg/L)
1	0.000
2	0.000
3	0.002
4	0.005
5	0.005
6	0.006
7	0.006
8	0.010
9 (90th %)	***0.015***
10	0.020
The system does not exceed the lead action level because its 90th percentile level (the 9th sample) is 0.015 mg/L which equals the lead action level. To have an exceedance, the 90th percentile level must be greater than 0.015 mg/L.	

In Example 2 below, the system is required to collect a minimum of 10 valid samples. It collects 12 valid samples and thus, all 12 are used in the 90th percentile calculation. In this example, the 90th percentile level is 10.8 (i.e., ***12 samples x 0.9 = 10.8***).

Example 2: Determining Whether An Action Level Has Been Exceeded When the 90th Percentile Level Contains A Decimal	
Sample Rank	**Sample Value** (mg/L)
1	0.000
2	0.000
3	0.002
4	0.005
5	0.005
6	0.005
7	0.006
8	0.006
9	0.010
10	0.014
11	0.018
12	0.020

Either rounding or interpolation can be used to determine the 90th percentile level when the sample that represents the 90th percentile value is not a whole number. Your State may specify which method you should use.

Using Rounding: EPA's policy is to:

1. Round down to the nearest whole number if your decimal is 0.4 or lower.
2. Round up to the nearest whole number if your decimal is 0.5 or higher.

In this example, the 90th percentile sample is 10.8, and you would round up to 11. So, the sample that is ranked 11th in the list represents the 90th percentile value that you compare to the relevant action level.

Using rounding, the 90th percentile result is 0.018 mg/L and the system exceeds the lead action level of 0.015 mg/L.

Using Interpolation: To determine the 90th percentile level, using interpolation, you would:

1. Subtract the difference between the two samples between which your 90th percentile falls. In this example you subtract the 10th sample result of 0.014 mg/L from the 11th sample result of 0.018 mg/L, for a difference of 0.004 mg/L.
2. Multiply the difference of 0.004 mg/L by 0.8 because the 90th percentile level is 0.8 higher than the 10th sample result: 0.004 x 0.8 = 0.0032 mg/L (or 0.003 when rounded to the number of significant figures).
3. Add 0.003 to the lower of the two sample results, in this example to the 10th sample result of 0.014 mg/L: 0.003 + 0.014 = 0.017 mg/L.

Using interpolation, the 90th percentile lead level is 0.017 mg/L and the system exceeds the lead action level.

✎ **Note:** The LCRMR allow the State to perform the 90th percentile calculation for you if:

- your State has notified you that it will perform this calculation;
- you provide your sampling results and sampling site information by the State-specified date; and
- your State gives you the results of the 90th percentile calculation before the end of the monitoring period.

However, if you do not meet all three of these criteria, you must calculate the 90th percentile results yourself, and provide them to the State.

What If the State Determines that My Samples Are Invalid? (See §141.86(f))

Under the LCRMR the State can invalidate a lead or copper tap water sample if ***any*** one of the following are true:

1. The laboratory establishes that improper analysis caused errors;
2. The State determines that the sample site did not meet the site selection criteria;
3. The sample container was damaged in transit; or
4. Substantial reason exists to believe that the sample was tampered with.

In order for the State to make this determination, you must report to the State all sample results and documentation of the reasons that the samples should be invalidated. Samples may not be invalidated solely on the grounds that a follow-up sample result is higher or lower than the original sample. ✔ ***Please check with your State before requesting sample invalidation, because your State may be unable to implement this provision until it has been incorporated into its drinking water regulations.***

Replacement Samples: If the State invalidates your sample(s), you only need to collect a replacement sample if the number of valid samples is below the minimum number of required samples. For example, assume you are on standard monitoring and only collect the required number of samples (use 40 as an example). If one of these samples is invalidated, you only have 39 valid samples, and therefore, must collect 1 replacement sample. Conversely, if you initially collected 41 samples and 1 was invalidated, you would still have 40 valid samples and would not need to collect a replacement sample. Note that if a replacement cannot be taken at the same location, it should be taken at a location other than one already used for sampling during the monitoring period.

Replacement samples must be taken as soon as possible, but within 20 days of the date of invalidation, or by the end of the applicable monitoring period, whichever is later. Note that if these samples are taken after the end of the applicable monitoring period, they cannot be used to fulfill the sampling requirements of a subsequent period. For example, assume a replacement sample is collected in July 2001 for one invalidated sample that was collected during the January through June 2001 monitoring period. You cannot include this replacement sample as part of your samples for the July through December 2001 monitoring period.

Please note that you may find yourself in a situation where the State invalidates your sample(s) on a date that does not allow you to collect a replacement sample during the months in which you are required to conduct monitoring (i.e., June through September or an alternate period designated by the State). In this event, you can collect this sample outside this time period, as long as you collect the sample(s) no later than 20 days after the date the sample(s) was(were) invalidated or by the end of the monitoring period, whichever occurs later. For example, assume you are required to conduct monitoring during June through September and the State invalidates one of your samples on October 15, 2000. You have until November 4, 2000 (i.e., 20 days after the State's invalidation decision) to collect the replacement sample.

REMEMBER: If a sample is determined to be invalid, you cannot include it in your 90th percentile calculations. However, the replacement sample must be included in the calculation.

What Should I Do If I Exceed an Action Level While I am Monitoring at 6-month intervals? (See §141.80)

If the 90th percentile lead level exceeds 0.015 mg/L or if the 90th percentile copper level exceeds 1.3 mg/L, you must:

- Conduct WQP monitoring in each monitoring period in which you exceed an action level, if you serve 50,000 or fewer people. If you are a large system, you are required to collect WQPs regardless of whether you exceed an action level (unless you meet the (b)(3) criteria) (see §141.87). Refer to Chapter III which discusses WQP requirements in more detail.
- Collect lead and copper source water samples and submit a source water treatment recommendation to the State, if you have not already done so within 6 months of the exceedance (see §141.83(b)). Form 141-D, Source Water Monitoring and Treatment, in Appendix E has been provided to assist you with compiling the information needed to support and provide your recommendation. You do not need to complete the boxes entitled "Certification that Source Water Treatment Has Been Installed" or "Request for Modification of State Treatment Decisions and/or Maximum Permissible Lead and Copper Levels".
- Submit an optimal corrosion control treatment recommendation to the State, if you have not already done so within 6 months of the exceedance for systems serving 50,000 or fewer people. Systems serving more than 50,000 people were required to provide this recommendation as part of their corrosion control study by July 1, 1994 (see §141.81)(e)(1)).

In addition, for lead action level exceedances, you must:

- Deliver the public education program described in *Lead in Drinking Water Regulation: Public Education Guidance*, EPA 816-R-02-010. If your system has never exceeded, or if the exceedance occurred after a monitoring period without a lead exceedance, then delivery is due within 60 days. If it is a continued exceedance, then delivery is every 6 months or annually depending on whether you are a CWS or NTNCWS and depending on the form of public education delivery required (see §141.85).
- If you exceed the lead action level after installing optimal corrosion control treatment and/or source water treatment (whichever occurs later), you must replace 7 percent of your lead service lines within 12 months of the exceedance. You also must replace an additional 7 percent every 12 months thereafter for as long as you continue to exceed the lead action level. However, the State may require that more than 7 percent be replaced each year (see §141.84). Chapter V provides an overview of the lead service line replacement requirements and a more detailed discussion regarding the related monitoring and reporting requirements.

What Should I Do If I Exceed the Lead or Copper Action Level During Reduced Monitoring? (See §§141.80 & 141.86(d)(4)(vi)(A))

If the 90th percentile lead level exceeds 0.015 mg/L ***or*** 90th percentile copper level exceeds 1.3 mg/L, you must:

- Stop monitoring at a reduced number and frequency, and, 6 months from the date of the exceedance, begin collecting the standard number of samples every 6 months (see §141.86(d)(4)(vi)). Refer back to Table 2-2 to find the correct number of sites for your system size.
- Conduct WQP monitoring in each monitoring period in which you exceed an action level, if you serve 50,000 or fewer people. If you are a large system, you are required to collect WQPs regardless of whether you exceed an action level (unless you meet the (b)(3) criteria) (see §141.81(b)(3) & §141.87).
- If you have not collected source water samples or submitted a source water treatment recommendation to the State, do so within 6 months of the exceedance (see §141.83(b)). As mentioned previously, you can use Form 141-D to assist you with preparing and documenting your source water treatment monitoring results and recommendation.
- If you exceed the lead action level after installing optimal corrosion control treatment and/or source water treatment (whichever occurs later), you must begin lead service line replacement (see §141.84).
- Within 60 days of a lead action level exceedance, deliver the public education program described in EPA's *Lead in Drinking Water Regulation: Public Education Guidance,* EPA 816-R-02-010 (see §141.85).

Can I Ever Discontinue Lead and Copper Tap Monitoring?

No, the lead and copper regulations do not allow you to discontinue lead and copper tap monitoring; only to reduce the number and frequency of this monitoring.

What Lead and Copper Tap Monitoring Information Must I Report to the State? (See §§141.90(a) & (h))

Within 10 Days of the End of the Monitoring Period

Within 10 days of the end of the monitoring period (i.e., 6 months, 1 year, 3 years, or 9 years), you must report the following information to the State:

- All tap sample results, including any samples which meet the lead and copper monitoring protocol and are above the minimum required number of samples for standard or reduced monitoring.
- Documentation for any tap sample for which you are requesting sample invalidation (if applicable).

- 90th percentile calculations. Under the LCRMR, the State may elect to do this for you. However, if the State has not contacted you about this, you are responsible for these calculations.
- Written explanation for any changes in sampling location (e.g., if homeowners no longer allow sampling from their taps).

Newly Required by the LCRMR

If you are on a reduced monitoring schedule (i.e., collect lead and copper tap samples less frequently than semi-annually), the LCRMR require you to submit notification of any change in source water or treatment within 60 days of the change or sooner if required by the State. The State may return you to a standard monitoring schedule or take other appropriate steps, if needed.

Less Stringent LCRMR Reporting Provisions:

The following provisions are generally less stringent than the LCR and your State may not be able to implement them until the provisions are incorporated into its regulations. Your State may also elect not to incorporate these revisions into its regulations. ✓***Please check with your State before following through on any of these provisions.***

- Under the LCRMR you may no longer be required to provide a:
  - certification showing that residents who took samples were informed of proper sampling procedures;
  - certification that each sample represents a first-draw sample;
  - justification for using sites that do not meet the Tier 1 criteria; or
  - written request for moving to a reduced tap monitoring schedule when you meet your optimal WQPs (under §141.86(d)(4)).

- If you are an NTNCWS or CWS (such as a prison or hospital) that does not have enough inside taps where the water stands unused for at least 6 hours, the LCRMR allow you to use inside taps that are the most likely to have remained unused for the longest period of time. The State will determine whether you must receive prior approval to collect non-first draw samples, or whether you can submit documentation that identifies each site and length of standing time for the samples collected at these sites when you submit your sample results. Unless you make additional changes to your sampling plan during subsequent monitoring periods, this is a one-time reporting requirement.

What Should I Do If I Sell Water To, or Buy Water From, Another Water System? (See §141.29)

EPA's position on the consolidation of sampling requirements under the Lead and Copper Rule was stated in a January 10, 1992 memorandum, entitled "*Consecutive Systems Regulated under the National Primary Drinking Water Regulations for Lead and Copper*". Highlights and excerpts from this memorandum are presented below.

EPA believes it is reasonable to reduce monitoring in consecutive systems if the systems can demonstrate they are interconnected in a manner that justifies treating them as a single system, in accordance with §141.29.

Prior to allowing consecutive systems to consolidate their sampling, the State should submit to its EPA Regional office a written explanation of how the monitoring, treatment, and reporting requirements will be administered and enforced in consecutive systems that consolidate their operations for lead and copper. These proposals should clearly identify which systems will be held accountable for violations of any of the rule's requirements. Should enforcement actions ever become necessary, it is vital that the party responsible for monitoring, or, if needed, subsequent treatment and/or other activities (including public education or lead service line replacement) be clearly identified and accept responsibility for any rule violations.

The key elements that should be contained in the proposal are:

1. Rationale for reduced monitoring;
2. Explanations of the responsibilities among systems involved, including which water system(s) is (are) responsible for:
   - Collecting and reporting to the State the results of the lead and copper tap monitoring and all WQP monitoring;
   - Completing corrosion control requirements under §§141.81 and 141.82; and
   - Lead service line replacement.

> ✎ **Note:** EPA expects that the parent water system will take responsibility for corrosion control throughout the entire area served. Depending on contractual agreements, the size and configuration of the satellite system(s), and the distance from the parent treatment facility, individual corrosion control treatment may need to be installed at a point or points other than the parent plant.

3. How the following provisions will be modified:
   - Determination of 90th percentile lead and copper concentrations in the consolidated system; and
   - WQP monitoring to determine baseline values and ensure that optimal corrosion control treatment is properly installed and maintained.
4. If applicable, how the responsibility for public education, source water monitoring, and source water treatment will differ from the responsibilities as assigned in the preamble to the LCR.

> ✎ **Note:** In the preamble to the 1991 LCR, EPA has stated that responsibility for public education delivery resides with the retailer (i.e., the consecutive or "satellite" system) and responsibility for source water monitoring and treatment resides with the wholesaler or "parent" system.

What Happens If I Do Not Fulfill My Lead and Copper Tap Monitoring And Reporting Requirements? (See §141.80(k))

If you do not meet all of the following monitoring and reporting requirements within the time frame specified by the rule, you are in violation of these requirements:

- Use appropriate sampling procedures in accordance with §§141.86(a) and (b);
- Collect the required number of samples during the specified time frame in accordance with §§141.86(c) and (d);
- Ensure samples are analyzed properly in accordance with §141.89(a);
- Submit all required monitoring information on time in accordance with §141.90(a); ***or***
- Report a change in treatment, or an addition of a new source, within 60 days or within the time frame specified by the State, if you are on reduced monitoring, have a waiver, or are a (b)(3) system, as required by §141.90(a)(3).

Depending on whether the State adopts the less stringent provisions of the LCRMR into its revised drinking water regulation, you may also be in violation if you do not meet the following requirements within the timeframe specified by the rule:

- Meet replacement sample requirements for invalidated samples as described in §141.86(f)(4) where these samples are needed to meet minimum sampling requirements;
- Meet the conditions of your monitoring waivers in §141.86(g) or provide the required information in §§141.90(a)(4)(ii)-(iv);
- Provide sample information needed for your State to perform the 90th percentile calculation as outlined in §141.90(h);
- Collect non-first draw samples that did not meet the criteria in §141.86(b)(5); ***or***
- Meet the monitoring deadline for transitioning to an alternate period (i.e., months other than June through September) for collecting reduced lead and copper tap samples, as specified in §141.86(d)(4)(iv)(B).

If you are out of compliance, you must:

1. Report the violation to the State within 48 hours of determining the noncompliance (see §141.31(b)).
2. Deliver public notification to your customers. If your State has not adopted the new public notification requirements, refer to §141.32. Otherwise, refer to §141.201 & §§141.203 - 141.206 or to EPA's *Public Notification Handbook* (EPA 816-R-00-010, June 2000). The Handbook is available on EPA's website at www.epa.gov/safewater/pn.html.

3. If you are a CWS, include a discussion of the violation in your consumer confidence report, including potential adverse health effects and actions taken to address the violation. Refer to §§141.153 & 141.154 or to EPA's *Preparing Your Drinking Water Consumer Confidence Report* (EPA 816-R-99-002, March 1999). This document is available on EPA's website at www.epa.gov/safewater/ccr1.html.

Also keep in mind that:

1. An action level exceedance is not a violation and does not trigger public notification requirements. However, if you exceed the lead action level, you must deliver public education to your customers. In addition, if you are a CWS, you must include in your consumer confidence report, the 90th percentile value for the most recent sampling (if it is a value greater than 0) and the number of sites that exceeded the action level.
2. If you have been granted a monitoring waiver and do not conduct your lead and copper monitoring properly or on-time, you no longer meet the conditions of your waiver and the State may revoke your waiver. You can reapply at a later date when you again meet the eligibility requirements for a waiver.
3. Consecutive rounds of monitoring are needed to qualify for reduced lead and copper tap monitoring. Thus, noncompliance with your lead and copper tap monitoring requirements can impact how quickly you can qualify for reduced monitoring.

What Provisions of the LCRMR Pertain to Lead and Copper Tap Monitoring and Reporting? (See §141.86 & §141.90(a))

The table below summarize those lead and copper tap monitoring and related reporting provisions that have been discussed throughout Chapter II. The table distinguishes between those provisions that you were required to begin implementing on April 11, 2000 and those less stringent provisions with which you must first check with your State before implementing. Remember, if you own or operate a water system on Tribal lands, in Wyoming, or the District of Columbia, the Federal version of the LCRMR applies to you. Therefore, you were required to implement all of the following provisions beginning April 11, 2000.

You Were Required to Comply with These Monitoring Requirements Beginning April 11, 2000
If you do not have enough Tier 1, 2, or 3 sites, you must use representative sites to meet minimum sampling requirements.
If you are on reduced lead and copper tap monitoring, you must collect from sites that are representative of the ones you used during standard monitoring. *(Your State entity may specify where to collect these samples.)*
If you are on reduced lead and copper tap monitoring, are a (b)(3) system, or have a monitoring waiver, you must notify your State in writing no later than 60 days after changing treatment or adding a new source.

You Must First Check With Your State Before Implementing the Following Provisions
Your State may allow you to conduct reduced lead and copper monitoring during months other than June through September.
If you operate 24 hours a day and you do not have enough taps that can supply first-draw lead and copper samples, you may be able to collect samples from the taps that have the longest standing times.
You can collect lead and copper tap water samples once every 3 years after monitoring for only 2 consecutive, 6-month monitoring periods, if your 90th percentile levels are $\leq$ 0.005 mg/L for lead and $\leq$ 0.65 mg/L for copper.

You Must First Check With Your State Before Implementing the Following Provisions (Continued)

You can ask your State to invalidate lead and copper tap water samples if the samples meet ***at least one*** of the criteria below and you provide documentation that supports your request:

- There is a laboratory error;
- The sample was damaged in transit;
- The State determines that the sample was taken from an inappropriate site; or
- The State believes the sample was tampered with.

Note: *If you do not have enough valid samples after the State invalidates your sample(s), you must collect enough replacement samples to meet the minimum sampling requirements.*

You may request a 9-year monitoring waiver for lead and/or copper tap monitoring if:

- You serve 3,300 or fewer persons;
- Your 90th percentile levels are ≤ 0.005 mg/L for lead and/or ≤ 0.65 mg/L for copper; and
- Your plumbing materials meet certain criteria that indicate negligible risk from lead and/or copper exposure.

You may no longer be required to:

1. Calculate and report your 90th percentile lead and copper levels if:
   - Your State has notified you that it will perform this calculation;
   - You provided your sampling results and sampling site information to your State no later than the date specified by your State *(**Note:** this date will be sometime before the end of the monitoring period)*; and
   - Your State gave you the results of the 90th percentile calculation before the end of the monitoring period.
2. Submit certifications that you followed proper sampling procedures or that homeowners collected samples after receiving proper instructions.
3. Provide justifications if your sampling pool contains Tier 2 or Tier 3 sites or an insufficient number of sites served by lead service lines.
4. Request in writing your State's permission to monitor for lead and copper on a reduced schedule after you meet your OWQPs. *(You still must **receive written approval** from your State before you begin reduced monitoring.)*

What Key Points Should I Remember About Lead and Copper Tap Monitoring? (See §§141.81 & 141.86)

- You must sample at Tier 1 sites. If an insufficient number exist, use Tier 1, followed by Tier 2, Tier 3, and representative sites. *(Note: Tier 3 sites only apply to CWSs.)*
- If you have lead service lines in your distribution system, you should collect at least half of your samples from sites served by lead service lines. If you have no lead service lines, but you have lead goosenecks or pigtails, you can collect tap water samples at the sites with the goosenecks and/or pigtails.
- You should identify more sampling sites than the number of samples you are required to collect during each monitoring period, in case volunteers drop out.
- If you do not have the required number of sampling sites, it may be necessary to collect more than one sample from the same location, on different days, in order to collect the minimum number of required samples.
- Samples must be 1-liter in volume and be taken from an interior tap where the water has stood in the pipes for at least 6 hours *(except as noted below)*.
- If you are an NTNCWS or CWS that does not have enough inside taps where the water stands unused for at least 6 hours, your State may allow you to use inside taps that have remained unused for the longest period of time.
- You should collect samples early enough in the monitoring period in case WQP samples are required (e.g., small or medium systems that exceeds the lead or copper action level).
- You must initiate corrosion control treatment steps if you exceed the lead or copper action level or if you serve more than 50,000 people and you are not a (b)(2) or (b)(3) system.
- You must collect source water samples if you exceed lead and copper action levels.
- If you serve 50,000 or fewer people, you can stop corrosion control treatment steps whenever your 90th percentile lead and copper levels are at or below their action levels for 2, consecutive, 6-month monitoring periods. You must recommence these steps if you again exceed either action level.
- If you serve 50,000 or fewer people, you qualify for reduced annual monitoring if you have 2, consecutive, 6-month periods at or below both action levels. You can qualify for triennial monitoring if you have 3 consecutive years of monitoring at or below both action levels.
- Regardless of the number of people that you serve, you can qualify for reduced monitoring if you are in compliance with your OWQP specifications for a minimum of 2, consecutive, 6-month periods and you receive written approval from the State.
- Regardless of the number of people that you serve, you can qualify for triennial monitoring at the reduced number of sites, if your 90th percentile lead level is $\leq$ 0.005 mg/L ***and*** 90th percentile copper level is $\leq$ 0.65 mg/L, for 2, consecutive, 6-month periods *(if the State has adopted this provision)*.
- If you serve 3,300 or fewer people, you can monitor once every 9 years at the reduced number of sites, if you qualify for a monitoring waiver, and the State has adopted this provision.

CHAPTER III: WATER QUALITY PARAMETER MONITORING AND REPORTING REQUIREMENTS

What Is The Purpose of Collecting Water Quality Parameter Samples? (See §141.87)

WQPs are used to determine the corrosivity of the water, and if needed, to help the State determine the type of corrosion control that system should install and how the treatment should be operated. For most water systems that require treatment, corrosion control treatment is the primary mechanism for reducing their lead and copper levels.

WQP samples include analysis for:

- pH;
- Alkalinity;
- Calcium;
- Conductivity;
- Water temperature;
- Orthophosphate, if an inhibitor containing phosphate is used; and
- Silica, if an inhibitor containing silica is used.

WQP samples are collected at two separate locations:

- At entry points to the distribution system; and
- At representative taps throughout the distribution system *(approved coliform sampling sites may be used)*.

Which Systems Must Collect Water Quality Parameter Samples? (See §141.87)

If you serve more than 50,000 people, you must conduct some WQP monitoring. However, if you meet the (b)(3) criteria based on initial lead and copper tap monitoring, you are only required to conduct WQP monitoring during the same 2, consecutive, 6 months in which you conducted initial lead and copper tap monitoring.

If you serve 50,000 or fewer people, you do not have to collect WQP samples unless you exceed an action level. During any monitoring period in which you exceed the lead or copper action level, WQP samples must be collected from entry points to the distribution system and from a set of representative sites located throughout the distribution system.

When Do I Collect Water Quality Parameter Samples? (See §§141.87(b)-(e))

Water quality parameter monitoring can be divided into three phases:

- Initial WQP monitoring;
- Follow-up monitoring that occurs in the year following the installation of corrosion control treatment; and
- Monitoring that occurs after the State sets OWQPs.

Each of these is discussed in greater detail below. In addition, refer to the timelines in Appendix C which illustrate how WQP monitoring requirements are impacted by a system's size category and whether it exceeds an action level.

Initial WQP Monitoring

Initial WQP monitoring is conducted during the same monitoring period(s) as initial lead and copper tap monitoring. During initial monitoring, WQP samples are collected at representative sites in the distribution system (also referred to as tap samples) and at each entry point to the distribution system for:

- pH;
- Alkalinity;
- Calcium;
- Conductivity;
- Temperature;
- Orthophosphate, when a phosphate-based corrosion inhibitor is used; and
- Silica, when a silicate-based corrosion inhibitor is used.

If you serve more than 50,000 people, you were required to conduct WQP monitoring during the same 2, consecutive, 6-month monitoring periods as initial tap monitoring. Thus, for systems that were in existence prior to 1992, WQP monitoring was required to be conducted during the monitoring periods of January 1 through June 30, 1992 and July through December 31, 1992.

If you serve 50,000 or fewer people, and you exceeded the lead and/or copper action level, you must monitor before the end of the 6-month initial tap monitoring period(s) during which the action level is exceeded. Because WQP samples must be collected in the same monitoring period in which you exceed an action level, you should collect lead and copper tap water samples early in the monitoring period. If you exceed during the first round of initial tap monitoring, you are immediately triggered into corrosion control treatment requirements. If your State requires you to collect a second set of lead and copper tap samples or you elect to conduct this monitoring and you exceed the action level, you will also be required to collect WQP samples during this 6-month monitoring period. Table 3-1 below illustrates the timing for systems serving 50,000 or fewer people that were in existence prior to January 1992.

REMEMBER: For systems of any size, while you are conducting a corrosion control study and installing corrosion control treatment, you are not required to collect WQP samples, unless required by the State. Samples that are required as part of the study or during treatment installation are not counted towards compliance with your normal WQP sampling requirements.

Table 3-1: Initial WQP Requirements for Systems Serving 50,000 and Fewer People		
If you serve...	***And you exceeded during the...***	***You were required to collect WQP samples during...***
3,301 to 50,000 people	1st monitoring period of July - December 1992	July - December 1992
	2nd monitoring period of January - July 1993	January - July 1993
25 to 3,300 people	1st monitoring period of July - December 1993	July - December 1993
	2nd monitoring period of January - July 1994	January - July 1994
✎ **Note:** If you are a new system, the State will specify when you must begin initial lead and copper tap monitoring. WQP samples must be collected before the end of the 6-month initial tap monitoring period(s) during which an action level is exceeded.		

REMEMBER: A small or medium system that does not exceed an action level does not have conduct any WQP monitoring unless required by the State.

During each initial monitoring period in which you are required to conduct WQP monitoring, you must collect:

- 2 samples at each of the number of tap sites specified in Table 3-2; and
- 2 sample at each entry point to the distribution system.

Table 3-2: Standard Number of WQP "Tap" Sites and Samples		
System Size (No. of People Served)	**No. of Sites (Standard)**	**No. of Samples (2 per site)**
> 100,000	25	50
10,001 to 100,000	10	20
3,301 to 10,000	3	6
501 to 3,300	2	4
≤ 500	1	2

As an example, assume a system serving 9,000 people has 3 entry points. The regulation requires the system to collect 2 distribution samples at 10 sites and 2 samples at each entry point to the distribution system. Therefore, during January through June 1992, these systems would have collected 20 WQP tap samples and 6 entry point samples. During July through December 1992, the system would have collected the same number of entry point and WQP samples.

Follow-up WQP Monitoring

Follow-up monitoring occurs in the 12 months immediately following the installation of corrosion control treatment. These samples are collected during the same 2, consecutive, 6-month monitoring period(s) as follow-up lead and copper tap monitoring.

If you serve more than 50,000 people, you were required to conduct this monitoring during 2, consecutive, 6-month monitoring periods of January through June 1997 and July through December 1997, unless the State determined you met the criteria of a (b)(2) or a (b)(3) system. As previously discussed, (b)(2) systems have already installed treatment that is equivalent to that required under the lead and copper regulations. These systems are not required to conduct initial or follow-up WQP monitoring.

If you serve 50,000 or fewer people, WQP monitoring is only required during each of the 6-month follow-up monitoring periods in which you exceed the lead or copper action level. Therefore, if you install corrosion control treatment and are at or below both action levels, you are not required to conduct follow-up WQP monitoring. However, your State may require you to continue WQP monitoring to demonstrate that you are properly operating corrosion control treatment.

You must collect 2 samples at each of the number of WQP sites specified in Table 3-2, during each of 2, consecutive, 6-month monitoring periods for:

- pH;
- Alkalinity;
- Calcium, when calcium carbonate stabilization is used;
- Orthophosphate, when a phosphate-based inhibitor is used; and
- Silica, when a silicate-based inhibitor is used.

These samples should be collected evenly throughout the year to reflect seasonal variability.

You also must immediately begin taking ***1 set*** of the following WQP samples at each entry point at least once every 2 weeks:

- pH;
- When alkalinity is adjusted, a reading of the dosage rate of the chemical used to adjust alkalinity and the concentration of alkalinity; and
- When an inhibitor is used, a reading of the dosage rate of the inhibitor used and the concentration of orthophosphate or silicate (whichever is used).

> ✎ **Note:** Once treatment has been installed, entry point monitoring changes from 2 samples per entry point at 6-month intervals to 1 sample per entry point at least every 2 weeks.

After corrosion control treatment has been installed, the LCRMR allow ground water systems to limit sampling points to those representative of the water quality and corrosion control treatment conditions throughout the system. If this option is used, prior to sampling, the system must demonstrate to the State that the selected sites are indeed representative. Please note that this option does not apply to initial monitoring and can only apply if the State incorporates this provision into its drinking water regulations. ✔ ***First check with your State to determine if you can take advantage of this provision.***

Monitoring after the State sets OWQPs

The State uses the lead and copper tap and WQP data collected before and after the installation of corrosion control treatment to set WQP ranges or minimums (called optimal water quality parameters or OWQPs) that indicate that a system is operating corrosion control treatment at a level that most effectively minimizes the lead and copper concentrations at users' taps. The State sets ranges or minimums for the following OWQPs at entry points and within the distribution system (i.e., tap samples) within 6 months of receiving lead and copper and WQP follow-up monitoring results:

- pH;
- Alkalinity *(when alkalinity is adjusted)*;
- Orthophosphate *(when a phosphate inhibitor is used);*
- Silica *(when a silicate inhibitor is used);* and
- Calcium *(when calcium carbonate stabilization is used as part of corrosion control).*

For example, the State might require you to maintain pH between 7.8 and 8.2 at each entry point and a pH of 7.0 to 8.0 at all sampling sites in the distribution system. Similarly, the State might require you to install sodium bicarbonate at a dosage rate of 10 mg/L (measured at each entry point) to maintain alkalinity above 20 (measured at all distribution system sites). The State can also designate values for additional water quality control parameters.

The concentration of each applicable WQP is measured at entry points and at a specified number of sites within the distribution system (refer back to Table 3-2). Measurements at the entry points also

include a reading of the dosage rate of the chemical used to adjust the alkalinity (if applicable) and a reading of the dosage rate of the inhibitor used (if applicable).

After OWQPs are set, the frequency of WQP tap monitoring remains semi-annually (unless you qualify for reduced monitoring), and the frequency for entry point monitoring remains every 2 weeks.

If you serve more than 50,000 people and do not qualify as a (b)(3) system, you must collect WQP samples and operate in compliance with the OWQPs designated for your system. If you installed corrosion control treatment prior to the effective date of the rule (i.e., are a (b)(2) system), the LCRMR clarify that the State will designate OWQPs and that you must conduct WQP monitoring. Prior to the LCRMR, the regulation was unclear regarding the continuing monitoring requirements for (b)(2) and (b)(3) systems.

If you serve 50,000 or fewer people, you are only required to collect WQP samples during those monitoring periods in which an action level exceedance occurs, unless required by the State.

You must collect 2 samples every 6 months at the standard number of WQP tap sampling sites that is specified in Table 3-2 for:

- pH;
- Alkalinity;
- Calcium, when calcium carbonate stabilization is used;
- Orthophosphate, when a phosphate-based inhibitor is used; and
- Silica, when a silicate-based inhibitor is used.

You must collect 1 set of samples at each entry point (except those ground water systems that can limit entry point monitoring to representative sites) at least once every 2 weeks for:

- pH;
- When alkalinity is adjusted, a reading of the dosage rate of the chemical used to adjust alkalinity and the concentration of alkalinity; and
- When an inhibitor is used, a reading of the dosage rate of the inhibitor used and the concentration of orthophosphate or silicate (whichever is used).

> ✎ **Note:** The LCRMR also clarify that for those systems with treatment in place, the State must take measures to ensure that systems are operating treatment properly. Thus, the State could require you to collect WQP samples, even if you serve 50,000 or fewer people, or qualify as a (b)(3) system.

~Refer to the section entitled, "Can I Ever Reduce My WQP Monitoring?", for a discussion of the criteria that allow you to reduce the frequency of WQP tap monitoring~

How Do I Select My Sampling Sites? (See §141.87(a))

Distribution Samples

You must identify sampling sites in your distribution system representative of the water quality throughout the distribution system. These samples are also referred to as WQP tap samples. The number of tap WQP sampling sites are specified in Table 3-2. For ease, you may want to sample from sites used for coliform monitoring. The advantages associated with using these sites are: (1) access is available since the sites are already being used as sampling locations; (2) personnel are already in place to perform monitoring at these sites; and (3) the locations should be representative of the distribution system conditions as required by the Total Coliform Rule. You also can use the taps from which you collect lead and copper tap samples.

In order to ensure that your distribution sampling sites (or "tap" samples) are representative of water quality throughout the distribution system, you should consider the following:

- Size of the population you serve and where the population is located;
- All of the different sources of water you currently use;
- All of the different treatments installed and operating;
- The effects of seasonal variability on treatment and water quality;
- The proximity of WQP sites to lead and copper tap water sampling sites;
- The proximity of WQP sites to supplemental chlorination feed points;
- The proximity of WQP sites to ground or elevated storage locations;
- The sampling sites' representativeness of typical detention times of water in the distribution system;
- The sampling sites' representativeness of distinct pressure zones located throughout the distribution system; and
- The sampling sites' representativeness of distribution system materials.

Also, avoid areas in the distribution system where maintenance or flushing is conducted because water quality upsets are more likely to occur in these places. Remember, you are trying to collect data that is representative of typical water quality conditions in the distribution system.

Entry Point Samples

You must sample from each entry point to the distribution system to obtain a sample that is representative of the source after treatment. If 2 or more sources are combined before distribution, your sample must be representative of all sources used.

How Do I Collect Water Quality Parameter Samples? (See §141.87(a))

To Keep in Mind at the Sampling Site

Unlike lead and copper tap samples, WQP samples should be fully flushed. Samples collected at entry points to the distribution system must be collected at locations representative of each source of water after treatment.

If your system draws water from more than one source, and the sources are combined before distribution, you must collect samples at sites in the distribution system where the water is representative of all sources being used.

If you collect the WQP samples in the distribution system from the same location as coliform and disinfectant residual samples, you should collect the WQP samples in the following manner:

- Fully flush the tap and collect the coliform sample;
- Collect a sample to measure disinfectant residual;
- Collect and analyze sample for temperature and pH; and
- Collect the samples for the other WQPs.

When you collect WQP samples, you should always record your observations about color, suspended solids, and the flushing time required prior to achieving acceptable sampling conditions. During collection of the WQP samples, care should be taken to avoid the introduction of air bubbles into the sample which can affect the pH, conductivity, and dissolved oxygen content of the water sample.

Plastic or glass containers can be used when collecting WQP samples unless silica analyses are required, in which case, plastic must be used. All samples should be stored in a cool environment until analyzed. During transportation, care should be taken to avoid breakage of the sample.

Parameter-specific procedures to keep in mind

Temperature and pH: Temperature analyses must be conducted in the field to ensure accuracy. Measure temperature using either a hand-held thermometer or a combined temperature/pH electrode and meter. pH measurements must also be conducted in the field and must be made with a pH electrode and meter within 15 minutes of sample collection. The meter should be capable of measuring to 1/10 of a unit. The pH probe should be placed in a holding bottle and secured during transport. The probe's membranes are very delicate and should not come in contact with hard surfaces or be allowed to dry out. Pack a replacement probe just in case. In addition:

- Before collecting the pH sample, the pH electrode should be calibrated at pH 7.0 and a second pH level; either 4.0 or 10.0, depending on the pH range typically found within the distribution system.
- Before collecting the sample, remove the faucet aerator and run the water gently to flush the line.
- Fill the sample bottle to slightly overflowing.

- Use a closed-system bottle — which allows you to insert the thermometer or pH probe—to reduce measurement error.
- If you use a hand-held thermometer, insert it in the sample and record the reading when it stabilizes. Insert the pH electrode immediately after removing the thermometer.
- If you use a combined electrode and meter, insert it in the sample immediately after filling the bottle and measure temperature. Change the meter to measure pH levels and gently rotate the bottle until the pH reading stabilizes (may take several minutes).
- Record the pH measurement, rinse the electrode with deionized water and replace it in the holding bottle.

Other WQPs: When you collect WQP samples for alkalinity, calcium, conductivity, orthophosphate, and silica, you should take two, 500 mL samples at each sampling location. Two samples are needed because the calcium analysis is conducted using a separate sample in order to acidify the sample prior to measurement. The two, 500 mL samples counts as one set of samples; thus, you must repeat this for each of your 2 entry point sample sets during initial monitoring, as well as your 2 distribution ("tap") samples sets that are required during each WQP monitoring period.

How Does the State Determine If I Am In Compliance With My Optimal Water Quality Parameter Values? (See §141.82(g))

Prior to the LCRMR, you would incur a violation if the WQP value of any sample or the average of the original sample and confirmation sample was below the minimum value or outside the range designated by the State. If you elected to collect a confirmation sample, you were required to collect it within 3 days of collecting the original sample.

In each monitoring period in which you did not meet your OWQP specifications, you would incur a violation. For entry point monitoring, compliance was determined every 2 weeks. For tap WQP monitoring, compliance was determined for the monitoring period in effect (i.e., 6 months, 1 year, or 3 years).

Under the LCRMR, EPA revised the procedure for calculating compliance with OWQPs based on concerns raised by several States and water systems. A major concern was that the 1991 compliance approach created a significant disincentive for sampling WQPs more frequently than required, since the more frequently measurements are taken, the greater the potential that some of the results will be outside the OWQP ranges or below the OWQP minimums set by the State. Another concern was the "averaging" of results was not the best approach from an effective corrosion control perspective. A system might have to increase pH scale and cause other problems simply to set the average within range.

Under the LCRMR, compliance determinations are always based on a 6-month period, regardless of the system's monitoring schedule (e.g., daily, biweekly, semi-annually, annually, triennially) or whether the WQP results are from an entry point or the distribution system. The start of the first 6-month period begins on the day the State has designated OWQPs.

You cannot be outside the OWQP ranges or below the OWQP minimum (also known as an excursion) for more than a total of 9 days at a specific sampling point or combination of sampling points, or for a specific WQP or combination of WQPs during a 6-month period. The 9 days can occur anytime during the 6-month period and do not have to be consecutive. The 9 days allow you to make necessary repairs that may be causing your system to not meet its OWQP specifications.

Confirmation samples are no longer used. You must use the results of all WQP samples collected during the 6-month period at a sampling location to determine OWQP compliance and report these results to the State. However, States have discretion to delete results of obvious sampling errors from this calculation.

Daily values are calculated for each WQP at each sampling location. The procedure for determining the daily value is based on the sampling frequency for that WQP and sampling point. It is quite possible for you to collect several samples a day for a given WQP at one sampling location and to conduct annual monitoring at another. Although the term "daily values" contains the word "daily", in many instances, the daily value represents a measurement that was collected more or less frequently than once per day. Table 3-3, below, explains how to calculate the daily value based on the sampling frequency for a given WQP.

> ✎ *Please note that the State is not required to use this new OWQP compliance procedure.*
> ✓ *First check with your State to determine when and if you should use this new procedure for assessing compliance with your OWQPs.*

Table 3-3: Daily Value Calculation Based on Monitoring Frequency	
If you are monitoring for a specific WQP at a sampling site:	***Then the daily value is:***
More frequently than Daily	Calculated by averaging all the results measured at the sampling location for that WQP during the day. If both continuous monitoring results and grab samples are collected on the same day, both must be included in the calculation of the daily value. States can specify the frequency with which continuous monitoring results should be recorded. A State can also require systems to determine the "daily value" using another formula when they monitor more frequently than daily at the same sampling location. ✓*First check with your State regarding the frequency of recording values and procedures for aggregating results.*
Daily	Results of each daily sample for that WQP at that location.
Biweekly	Results of each sample collected during the 2-week period for that WQP at that location.
Semi-annually	Results of each sample collected during the 6-month period for that WQP at that location.
Annually or Triennially	The most recent measurement(s) taken, even if the measurement(s) was (were) collected during a previous monitoring period. **Example:** A system is on annual WQP tap monitoring during January - December 2000. It measures pH at the tap on January 10, 2000 (pH = 7.5) and June 20, 2000 (pH = 7.6). For the 6-month period of January - June 2000, there are two daily values because both measurements were collected during the 6-month period being evaluated. For the 6-month period of July - December 2000, only the most recent value of 7.6 is used.

For more information on the new OWQP compliance procedure, refer to: *How to Determine Compliance with Optimal Water Quality Parameters as Revised by the Lead and Copper Rule Minor Revisions,* February 2001, EPA 815-R-99-019.

Can I Ever Reduce My WQP Monitoring? (See §141.87(e))

After the State sets OWQPs, you can qualify for a reduction in the amount of monitoring conducted at tap locations ***only*** if you are in compliance with your OWQPs (i.e., do not have excursions for more than 9 days in a 6-month period). This reduction does not apply to entry point WQP monitoring. Entry point monitoring remains at a frequency of every 2 weeks.

Criteria for Reducing the Number of WQP Tap Samples

If you are in compliance with your OWQPs after 2, consecutive, 6-month monitoring periods ***and you serve more than 10,000 people***, you can reduce the number of sample sites at which you collect tap WQP samples from the standard number to the reduced number as shown in Table 3-4 below. However, 2 samples are still required at each location and the frequency remains at semi-annually.

Table 3-4: Reduced Number of WQP Tap Sites and Samples

System Size (No. of People Served)	No. of Sites (Reduced)	No. of Samples (2 per site)
> 100,000	10	20
10,001 to 100,000	7	14
3,301 to 10,000	3	6
501 to 3,300	2	4
25 to 500	1	2

✎ **Note**: The number of WQP tap samples for systems serving ≤ 10,000 people is the same under standard and reduced monitoring.

Criteria for Annual Monitoring

If you are in compliance with your OWQP specifications for 3 consecutive years of monitoring (beginning on the date the State sets WQP values), you may also reduce the frequency with which you collect your distribution WQP samples from once every 6 months to once per year and collect from the reduced number of sites.

Criteria for Triennial Monitoring

If you are on an annual WQP tap monitoring frequency and you are in compliance with your OWQPs for 3 ***consecutive*** years of monitoring, you may reduce the frequency with which you collect WQP tap samples from annually to once every 3 years. Systems serving more than 10,000 people would continue to collect from the reduced number of sites.

> ✎ **Note:** Unlike lead and copper tap monitoring, the first year of semi-annually monitoring does not count toward the first year of meeting the triennial monitoring criteria. Instead, you must collect WQP tap samples at the annual frequency for 3 consecutive years to qualify for triennial WQP tap monitoring.

The LCRMR has added an accelerated reduced monitoring provision for tap WQPs. You can now reduce the frequency of WQP monitoring at the tap to once every 3 years more rapidly than before. In order to qualify, you must demonstrate for 2 consecutive monitoring periods (either 6-month or annual periods):

1. Your 90th percentile lead level does not exceed 0.005 mg/L;
2. Your 90th percentile copper level does not exceed 0.65 mg/L; and
3. You are in compliance with your OWQP requirements.

In general, this provision will apply to large systems because unless required by the State, small and medium systems that are at or below both action levels are not subject to WQP monitoring requirements. ✔***First check with your State to determine if you can take advantage of this provision.***

Table 3-5 below summarizes the criteria that you must meet to qualify for reduced WQP tap monitoring. For systems serving more than 10,000 people, WQP tap monitoring is conducted at a reduced number of sites. Remember, this reduction does not apply to entry point samples; once corrosion control treatment is installed, these samples are collected at least every 2 weeks.

Table 3-5: Reduced WQP Tap Monitoring Criteria

Criteria[1] ***(Required time period in which system is in compliance with its OWQP Specifications)***	**Monitoring Frequency**	**Number of Years Since State Set OWQPs**
2 consecutive 6-month periods	Every 6 months	One
3 consecutive years (equals six, 6-month periods)	Annual	Three
3 consecutive years of ***annual*** monitoring[2]	Triennial	Six
2 consecutive monitoring periods: 1. 90th percentile lead level ≤ 0.005 mg/L; 2. 90th percentile copper level ≤ 0.65 mg/L; and 3. in compliance with OWQP specifications.		As early as One Year

[1] Compliance with OWQPs must occur in consecutive periods to qualify for reduced monitoring.
[2] Unlike lead and copper tap monitoring, semi-annual monitoring cannot count as the first year toward the triennial monitoring criteria. A system must be in compliance with its OWQP specifications for 3 years in which it collects WQP tap samples at the annual frequency before qualifying for triennial monitoring.

REMEMBER: If your State is using the new OWQP compliance procedure, you are in compliance with your OWQPs if you have excursions on no more than 9 days in a 6-month period (at any entry point or WQP tap sampling site or combination of sites). As long as this is the case, you can count this monitoring period toward qualifying for reduced monitoring.

Can I Ever Discontinue Water Quality Parameter Monitoring? (See §§141.81(b)(3), 141.82(g), & 141.87(b)-(e))

If you serve 50,000 or fewer people and you no longer exceed an action level, you can discontinue WQP monitoring. However, if you meet these criteria after installing treatment, your State may require you to continue WQP monitoring. The LCRMR clarify that systems with treatment in place must continue to properly operate it. Systems will also be required to undertake any additional measures that the State deems necessary to ensure treatment is operated properly. This may mean continued WQP monitoring even if you are at or below both action levels.

Similarly, if you are a large system and the State deems you to be a (b)(3) system, you are not required to continue WQP monitoring. However, if the State makes this determination after you have installed treatment, the State may require you to continue to conduct some WQP monitoring.

REMEMBER: If you serve 50,000 or fewer people, if you again exceed the lead or copper action level, you will be required to resume WQP monitoring. Similarly, if you are a large system and no longer meet the (b)(3) criteria, you also will be required to collect WQPs.

What Water Quality Parameter Monitoring Information Must I Report to the State? (See §§141.90(a)(1)(vi)-(viii) & (5))

The LCRMR clarify that you must report WQP monitoring results within the first 10 days following the end of each 6-month compliance period. *This reporting requirement still applies even if your State has not adopted the new OWQP compliance procedure.* For example, during the year of 2001, any WQP samples that you collected during January through June 2001 would be due to the State by July 10, 2001. Those samples that you collected during July through December 2001 would be due to the State by January 10, 2001. If you are on annual or triennial WQP tap monitoring, there will be some 6-month monitoring periods in which you will not have any tap WQP results to report.

If you are a ground water system and you are requesting approval to limit entry point monitoring to representative sites, you must provide a demonstration that selected sites represent water quality and

treatment conditions. ✔***Please check with your State before providing this demonstration to be sure this provision is included in the State's regulations.***

What If I Do Not Fulfill My WQP Requirements? (See §§141.80(k), 141.82(g), & 141.87(e)(4))

If you do not meet all of the following monitoring and reporting requirements within the timeframe specified by the rule, you are in violation of these requirements:

- Use appropriate sampling procedures in accordance with §§141.87(a)(1);
- Collect the required number and type of samples in accordance with §§141.87(a)(2),(b)-(e);
- Ensure samples are analyzed properly in accordance with §141.89(a);
- Submit all required monitoring information on time in accordance with §141.90(a)(vi)-(viii); ***or***
- Meet the State-approved sampling plan for collecting WQPs at representative entry point locations in accordance with §§141.87(c)(3) *(this criterion would only apply if you are a ground water system and your State's regulation allows you to limit entry point WQP monitoring to representative sites).*

In addition, you are in violation if you do not meet your OWQP ranges or minimums set by the State. If your State assesses compliance using the 1991 LCR procedure, you are out of compliance if the results of any WQP sample, or the average of the original sample and a confirmation sample, does not meet the State-designated OWQP ranges or minimums. Under the LCRMR, you are in violation of your requirements if you have OWQP excursions for more than 9 days in a 6-month compliance period.

If you are out of compliance with your monitoring, reporting, or OWQP requirements, you must:

1. Report the violation to the State within 48 hours of determining the noncompliance (see §141.31(b)).
2. Deliver public notification to your customers (see §141.32 if your State has not adopted the new public notification requirements or §141.201 & 141.203 - 141.206 if your State has adopted these new requirements).
3. Include a discussion of the violation in your consumer confidence report if you are a CWS, (see §§141.153).
4. Return to semi-annual WQP tap monitoring and lead and copper tap monitoring at the standard number of sites, if you are on reduced monitoring and you are in violation of your OWQP requirements. ***Note:*** *A monitoring and reporting violation does not impact your WQP monitoring schedule.*

EPA has also defined the timing of a 6-month monitoring period for small and medium systems on reduced lead and copper tap monitoring that are triggered into WQP monitoring because of an action level exceedance. For these systems, the end of the 6-month period for WQP monitoring is synchronized with the end of the reduced lead and copper tap monitoring period during which an action level was exceeded. This revision was made to correspond to the new OWQP compliance

procedure which is based on 6-month monitoring periods. For example, if you are on annual lead and copper tap monitoring during the time period of January 1 through December 31, 2001 and you exceed an action level, the corresponding WQP monitoring period would be July 1 through December 31, 2001.

What Provisions of the LCRMR Pertain to Water Quality Parameter Monitoring and Reporting? (See §141.82(g), §§141.87(c)(3) & (e)(ii), & §141.90(a))

The table below summarizes those provisions that directly impact your WQP monitoring and reporting requirements. It distinguishes between those provisions that you were required to begin implementing on April 11, 2000 and those less stringent provisions with which you must first check with your State before implementing. For water systems owned or operated on Tribal lands, in Wyoming, or the District of Columbia, all of the provisions listed below became applicable on April 11, 2000.

You Were Required to Comply with These Monitoring Requirements Beginning April 11, 2000
If you have installed corrosion control treatment but are not required to conduct WQP monitoring, you must continue to properly operate and maintain corrosion control treatment at all times.
You must report WQP monitoring results within the first 10 days following the end of the 6-month OWQP compliance period.

You Must First Check With Your State Before Implementing the Following Provisions

The LCRMR revises the OWQP compliance procedure as follows:

- "Daily values" are now used to determine compliance. Daily values are the sample results for each WQP and are calculated for each WQP at each sampling location. They are based on the sampling frequency for that WQP and sampling point.
- You are only out of compliance if you have an "excursion" for more than a total of 9 days during a 6-month period. An excursion is any "daily value" for a WQP that is below the minimum value or outside the range set by the State.
- Compliance determinations are always based on 6-month periods, regardless of your monitoring schedule (e.g., daily, biweekly, semi-annually, annually, triennially) or whether the sample is from an entry point or tap.
- Confirmation samples are no longer used. You must report the results of all samples collected during the 6-month period.

You can proceed to triennial WQP tap monitoring if you:

- Qualify for accelerated reduced lead and copper tap water monitoring (your 90th percentile levels are ≤ 0.005 mg/L for lead and ≤ 0.65 mg/L for copper), and
- Are in compliance with your OWQPs for 2 consecutive monitoring periods (either 6-month or annual).

You may limit biweekly WQP entry point monitoring to representative locations if:

- You are a ground water system; and
- You can demonstrate that these sites are representative of your system's water quality conditions.

What Key Points Should I Remember About Water Quality Parameter Monitoring? (See §§141.82(g) & 141.87)

- If you serve more than 50,000 people, you must conduct some WQP monitoring.
- If you serve 50,000 or fewer people, you do not have to collect WQP samples unless you exceed an action level or are required to by the State. However, you must collect WQP samples during any monitoring period in which you exceed the lead or copper action level.
- Samples must be collected from entry points to the distribution system and from a set of representative sites located throughout the distribution system (coliform sites may be used).
- Unlike lead and copper tap samples, WQP samples should be fully flushed. Samples collected at entry points to the distribution system must be collected at locations representative of each source of water after treatment.
- After you install corrosion control treatment, entry point monitoring changes from 2 samples per site every 6 months to 1 sample per site every 2 weeks.
- You can collect WQP tap samples from a reduced number of sites and/or a reduced frequency by meeting your OWQP requirements for a specified number of consecutive monitoring periods for both WQP entry points and distribution samples. Entry point monitoring remains biweekly.
- Unlike lead and copper tap monitoring, you cannot count semi-annual monitoring toward meeting the triennial monitoring criteria. You must have conducted WQP tap monitoring annually for 3 ***consecutive*** years and be in compliance with your OWQPs for these 3 years to qualify for triennial WQP tap monitoring.
- If your State adopts the new procedure for OWQP compliance, you are in compliance with your OWQP requirements if you have excursions for no more than a total of 9 days at specific sampling point or combination of sampling points, or for a specific WQP or combination of WQPs during a 6-month period.
- If you are on reduced monitoring for lead and copper tap monitoring or WQP tap monitoring, you must return to standard monitoring if you have excursions on more than 9 days in a 6-month period (based on the LCRMR compliance approach).

CHAPTER IV: LEAD AND COPPER SOURCE WATER MONITORING AND REPORTING REQUIREMENTS

What Is The Purpose of Collecting Source Water Samples? (See §§141.81(b)(3) & 141.88(a))

The purpose of requiring lead and copper sampling at the entry points to the distribution system is to:

1. Determine the contribution from source water to total tap water lead and copper levels.
2. Assist you and the States in designing an overall treatment plan for reducing lead and copper levels at the tap.
3. Assist the State in determining whether source water treatment is necessary to reduce lead and copper levels at the tap.

Source water samples are also required if you are trying to demonstrate that you have optimized corrosion control by meeting the criteria under §141.81(b)(3). Refer to the section entitled, What Is the Purpose of the Lead and Copper Regulations?, in Chapter I for a discussion of the (b)(3) criteria.

Which Systems Must Collect Source Water Samples? (See §141.88(a))

For systems of any size, source water monitoring for lead and copper is required if a system exceeds the lead or copper action level based on the 90th percentile lead or copper level ***in tap water samples***. Source water monitoring is also required for systems electing to demonstrate that they qualify as (b)(3) systems. Therefore, if a system never exceeds the lead or copper action level or is not trying to demonstrate that it qualifies as a (b)(3) system, lead and copper source water monitoring is not required.

> ✎ **Note:** If you are a (b)(3) system, your State may require you to collect source water samples every 3 years when you conduct lead and copper tap monitoring to confirm your (b)(3) status.

When Do I Collect Source Water Samples? (See §§141.88(a)-(e))

<u>If This Is The First Time You Have Exceeded The Lead Or Copper Action Level</u>

When you exceed the lead or copper action level for the first time, you must collect a sample at each entry point to the distribution system. Each sample must be analyzed for both lead and copper and the results must be submitted to the State within 6 months of the exceedance. The State will use these sample results to determine if source water treatment is needed. In addition to submitting source water samples, you must also submit a source water treatment recommendation to the State for review and approval within 6 months of exceeding an action level. This recommendation is based on source water monitoring results. You are not required to conduct a source water treatment study. As part of your recommendation, you should consider: ion exchange, reverse osmosis, lime softening, and coagulation/filtration. You can also recommend that no source water treatment is needed. EPA's guidance document *Lead and Copper Rule Guidance Manual Volume II: Corrosion Control*, September 1992 (see page 3-34), recommends source water treatment when the concentration of lead in the source

water is greater than 0.010 mg/L or the concentration of copper in source water is greater than 0.800 mg/L.

Form 141-D in Appendix E may be used to report your source water monitoring results ***and*** your source water treatment recommendation. If you use this form, you must also attach a copy of the analytical results from the laboratory. The State will make a decision regarding source water treatment and notify you within 6 months of its receipt of your sample results.

If The State Requires You To Install Source Water Treatment

If the State requires you to install source water treatment, you have 24 months to complete installing this treatment. You are not required to conduct source water monitoring while installing this treatment other than samples that you may elect to take to evaluate the performance of your treatment. You are not required to report these results to the State.

Once you have installed source water treatment, you must collect one sample from each entry point during 2, consecutive, 6-month periods, and analyze this sample for both lead and copper even if you exceed only one of the action levels. With the "before and after treatment" lead and copper results, the State will designate maximum permissible levels (MPLs) for lead and copper. These MPLs represent the highest lead and copper concentrations that are allowed in water entering the distribution system after source water treatment. The State will set MPLs for both lead and copper even if you exceeded the action level of only one of these contaminants.

After the State sets MPLs, your monitoring requirements are based on your source type as follows:

- ***If you use ground water as your only source,*** you must monitor during 3-year compliance periods. The first 3-year compliance period is the one in effect when the State specified MPLs for lead and copper. These are the same compliance periods that were established under the Standardized Monitoring Framework (SMF) for Phase II/V contaminants (e.g., 1993 - 1995, 1996 - 1998, 1999 - 2001, 2002 - 2004, etc.). This was done to allow you to coordinate your source water monitoring for lead and copper with other monitoring requirements.

- ***If you use surface water, ground water under of the direct influence of surface water (GUDI), or any combination of these sources with ground water***, you must monitor annually. The first annual monitoring period begins on the date that the State set your MPLs.

You can further reduce your source water monitoring frequency to once every 9 years based on the SMF compliance cycle (i.e., 1993 - 2001, 2002 - 2010, etc). The number of sites from which you must collect source water samples remains at one sample per entry point.

You can reduce your monitoring frequency to once every 9 years if you meet the criteria listed below.

- ***If you use ground water exclusively,*** you can collect source water samples once every 9 years if you do not exceed either the lead or copper MPL for 3 ***consecutive***, 3-year compliance periods (i.e., 9 years).

- ***If you use surface water, ground water under of the direct influence of surface water (GUDI), or any combination of these sources with ground water,*** you can collect source water samples once every 9 years if you do not exceed either MPL for 3 ***consecutive*** years.

If You Are Not Required To Install Source Water Treatment

If you continue to exceed the lead or copper action level but the State determines that source water treatment is not needed, your continued monitoring requirements are based on the date that the State made this determination and your source type as follows:

- ***If you use ground water as your only source,*** you must monitor during 3-year compliance periods. The first 3-year compliance period is the one in effect when the State determines that source water treatment is not needed.
- ***If you use surface water, GUDI, or any combination of these sources with ground water***, you must monitor annually. The first annual monitoring period begins on the date that the State determines that source water treatment is not needed.

> ✎ **Note:** Some States may have set MPLs for systems that were not required to install source water treatment. For these systems, the monitoring schedule is based on when the State set MPLs. More specifically, systems using ground water exclusively would begin triennial monitoring with the 3-year period in effect when the State set MPLs. All other systems would begin annual monitoring on the date that the State set MPLs.

The LCRMR expand the universe of systems that can conduct source water monitoring at a frequency of once every 9 years. The 1991 LCR did not allow systems that exceeded an action level, but for which the State did not set MPLs, to reduce the frequency of source water monitoring. ✓***Please check with your State to determine if they have adopted the provision described below.***

If you exceed an action level after the State has determined that source water treatment is not needed, you can reduce the frequency of source water monitoring if:

- your source water lead concentrations are ≤ 0.005 mg/L; and
- your source water copper concentrations are ≤ 0.65 mg/L; and
- you maintains these levels for 3 ***consecutive*** compliance periods.

Ground water systems would qualify for reduced monitoring after 3 consecutive, 3-year compliance periods or after 9 years. Surface water systems (or those using a combined source) would qualify after 3 consecutive years.

> **REMEMBER:** You cannot qualify for reduced source water monitoring unless the 3 compliance periods in which you meet the reduced monitoring criteria are consecutive.

Once you qualify for reduced source water monitoring (regardless of whether you install source water treatment or not), ***you are not required to return to standard monitoring***. In other words, an exceedance of an action level or of an MPL does not impact your source water monitoring schedule.

Where Are These Samples Collected? (See §141.88(a))

The sample location, collection methods, and number of samples required are the same as for Phase II/V contaminants, as explained below.

Sampling Requirements Based on Your Source

If you use ground water as your only source, you must take at least one sample at every entry point to the distribution system which is representative of each well after treatment. If there are separate entrances to your distribution system from either individual wells or wellfields, a sample must be collected from each discrete entry point. If you use multiple wells that draw from the same aquifer, the State can identify an individual well for monitoring, as long as there is no treatment or blending.

If you use surface water, GUDI, or any combination of these sources with ground water, you must take at least one sample at every entry point to the distribution system after the application of treatment or in the distribution system at a point which is representative of each source after treatment. These samples may be collected after storage during normal operating conditions or at the high service pumps.

Other Considerations for All Systems Conducting Source Water Monitoring

You must have your samples analyzed for ***both lead and copper*** even if you have only exceeded the action level for one of these contaminants.

If you are drawing from sources that are combined, samples should be taken during normal operations so that the water is representative of all sources being used.

Some States allow a maximum of 5 samples to be combined together and analyzed as one sample (known as compositing). The LCRMR require that compositing be done by a certified laboratory. There are two types of compositing: (1) compositing of samples collected within the same system (intra-system compositing) and (2) compositing among different systems (inter-system compositing). Inter-system composting is only allowed for systems serving 3,300 or fewer people. ✓***First check with your State to determine whether compositing of source water samples is allowed.***

If the lead concentration in a composite sample is greater than or equal to the lead resampling trigger of 0.001 mg/L, or if the copper concentration is greater than or equal to the copper resampling trigger of 0.160 mg/L, then a follow-up sample for the contaminant which exceeded the trigger should be taken at each site and analyzed within 14 days of when the original sample was collected. If duplicates of or sufficient amounts are available from the original samples from each sampling point, these may be used instead of resampling.

> ✎ **Note:** The LCRMR increased the copper resampling trigger from greater than 0.020 mg/L or 0.001 mg/L (depending on the analytical method) to greater than or equal to 0.160 mg/L and the changed the lead resampling trigger from greater than 0.001 mg/L to greater than *or equal* to 0.001 mg/L.

You must take each repeat sample at the same sampling site unless conditions make sampling at another site more representative of each source or treatment plant.

REMEMBER: Compositing allows you to save on analytical costs. It does not reduce the number of samples that you must collect. Also remember to first check with your State to determine if compositing of samples is allowed.

How Does the State Evaluate My Source Water Monitoring Results? (See §§141.83(b)(4) & 141.88(a)(2))

If the State sets MPLs for lead and copper, it will compare your source water results to these levels. If you exceed the lead or copper MPL, you can take a confirmation sample within 14 days of collecting the original sample. If the average of these results are still higher than the MPL, you are in violation. The State may require you to make changes to your source water treatment. If the State does not set these levels, it will review your results to determine if there are any significant fluctuations in your source water levels, indicating a possible need for source water treatment.

✎ **Note:** 90th percentile levels are never calculated for source water samples.

Can I Ever Discontinue Source Water Monitoring? (See §141.88(d)(2))

Once you exceed either the lead or copper action level, you are always subject to source water monitoring requirements. However, ***after*** the State has designated MPLs or determined that you are not required to install source water treatment, you ***are not required to collect any source water samples*** during any monitoring period in which your 90th percentile lead or copper levels of tap water samples are at or below their action levels for the entire source water monitoring period in effect. If your lead and copper tap and source water monitoring periods do not overlap, then source water monitoring is not required if your 90th percentile lead and copper levels from the last monitoring period were at or below their respective action levels. These points are illustrated in the three examples below.

EXAMPLE 1:

A system qualifies for reduced source water monitoring for the compliance cycle of 2002 through 2010. During this time period, the system is on triennial lead and copper tap monitoring. It conducts lead and copper tap monitoring during 2001 through 2003, 2004 through2006, 2007 through 2009, and 2010 through2012. Both the lead and copper 90th percentile levels are below the lead and copper action levels for all four monitoring periods. The system is not required to conduct source water monitoring because it was below both action levels during the entire source water monitoring period in effect (i.e., the 9-year compliance cycle of 2002 through 2010).

EXAMPLE 2:

Another system qualifies for reduced source water monitoring for the compliance cycle of 2002 through 2010. It conducts lead and copper tap monitoring during 2001 through2003, 2004 through 2006, 2007 through 2009, and 2010 through 2012. During the compliance period of 2010 to 2012, it

exceeds the lead action level. These lead and copper tap samples were collected during 2011. This system is not required to conduct source water monitoring during 2001 through 2010, but it would be required to conduct this monitoring during 2011 through 2019 because of the exceedance that occurred in 2011.

EXAMPLE 3:

Beginning January 1, 2000, a surface water system is on an annual source water monitoring schedule, and a triennial lead and copper tap monitoring schedule. The system collects lead and copper samples during 2001 for the compliance period of 2000 through 2002. It continues to exceed the copper action level, but still qualifies for triennial tap monitoring because it is in compliance with its OWQPs. The next time the system collects samples is in 2004 (for the 3-year tap monitoring period of 2003 through 2005) and for the first time, it is below both action levels.

The source water monitoring period in effect in this example is one year. This system must conduct source water monitoring in 2000, 2001, and 2002 because the system exceeded the copper action level. The system is also required to conduct monitoring in 2003 although no lead and copper tap monitoring occurred because it exceeded the copper action level during the last monitoring period. It is not required to conduct source water monitoring during 2004 and 2005 because the system was below both action levels.

REMEMBER: Once the State sets MPLs or determines that you are not required to install source water treatment, you can discontinue source water monitoring if you no longer exceed the lead or copper action level during the entire source water monitoring period in effect. The State does not set MPLs until after follow-up monitoring has been completed. Therefore, if you are required to install source water treatment, you must complete the 2 consecutive, 6-month rounds of follow-up source water monitoring even if you no longer exceed the lead or copper action level in your tap water samples.

What Source Water Monitoring Information Must I Report to the State? (See §141.90(b))

You must provide the following information within 10 days of the end of the monitoring period *(based on your source water lead and copper sampling schedule — 6 months, 1 year, 3 years, or 9 years)*:

- All source water sample results; and
- With the exception of your first round of source water monitoring, the identification of any new sampling location(s) and an explanation for any changes in your sampling site(s).

What If I Do Not Fulfill My Source Water Monitoring And Reporting Requirements? (See §§141.80(k) & 141.83(b)(5))

If you do not meet all of the following monitoring and reporting requirements within the timeframe specified by the rule, you are in violation of these requirements:

- Use appropriate sampling procedures (see §§141.88(a)(1) and (2));
- Collect the required number of source water samples (see §§141.88(a)(1) - (e));
- Ensure samples are analyzed properly (see §141.89(a)); ***or***
- Submit all required sampling information on time (see §141.90(b)).

You are also in violation if you do not meet your State-designated or approved MPLs. If you are above either MPL, you can take a confirmation sample within 2 weeks of the original sample, if allowed by the State. The results of the original and confirmation samples are averaged to determine whether you are in compliance with your MPLs (see §§141.88(a)(2)).

If you are out of compliance with your monitoring, reporting, or MPLs, you must:

1. Report the violation to the State within 48 hours of determining the noncompliance (see §141.31(b)).
2. Deliver public notification to your customers (see §141.32 or if the State has adopted the new public notification requirements, see §141.201 & §§141.203 - 141.206.)
3. Include a discussion of the violation in your consumer confidence report if you are a CWS (see §§141.153).

~ Also keep in mind that consecutive rounds of monitoring are needed to qualify for reduced lead and copper source water monitoring. Thus, noncompliance with your monitoring requirements will impact how quickly you can qualify for reduced monitoring. ~

What Provisions of the LCRMR Pertain to Source Water Monitoring and Reporting Requirements? (See §§141.88(a)(iv) & 141.88(e)(2)(ii))

The table below summarizes those provisions that directly impact your source water monitoring requirements. The LCRMR did not change your source water reporting requirements. The table distinguishes between those provisions that you were required to begin implementing on April 11, 2000 and those less stringent provisions with which you must first check with your State before following. For water systems owned and operated on Tribal lands, Wyoming, or the District of Columbia, all of the provisions listed below became applicable on April 11, 2000.

You Were Required to Comply with These Monitoring Requirements Beginning April 11, 2000
EPA has clarified that compositing (if permitted by the State) must be conducted by certified lab personnel. EPA has revised the resampling trigger for composite samples to: • ≥ 0.001 mg/L for lead; and • ≥ 0.160 mg/L for copper. *(This one for copper is less stringent because the resampling trigger was increased from 0.020 mg/L to 0.160 mg/L.)*
You Must First Check With Your State Before Implementing the Following Provisions
You may conduct source water monitoring on a reduced schedule even though you exceed an action level, ***if***: • your source water levels are ≤ 0.005 mg/L for lead and ≤ 0.65 mg/L for copper; and • your State has determined that source water treatment is unnecessary.

What Key Points Should I Remember About Lead and Copper Source Water Monitoring? (See §§141.83 & 141.88)

- Source water lead and copper monitoring is not required if you do not exceed the lead or copper action level based on tap water monitoring or you are not trying to qualify as a (b)(3) system.
- You must analyze for both lead and copper even if you exceed only one of the action levels in lead or copper tap monitoring.
- You must collect a set of samples at each entry point and provide a source water treatment recommendation (that can include no treatment needed) within 6 months of exceeding an action level. No source water treatment study is required.
- Source water samples are compared against the lead and copper MPLs. 90th percentile levels ***are not*** calculated for source water samples and compared against the action level.
- If you are required to install source water treatment, you must complete follow-up source water monitoring regardless of whether your 90th percentile lead and copper tap monitoring results are at or below the lead and copper action levels. If you are required to install source water treatment, the State will establish MPLs for both lead and copper even if you only exceeded one of the action levels in tap water monitoring.
- Once the State sets MPLs or determines that source water treatment is not needed, ground water systems must monitor every 3 years beginning with the SMF compliance period in effect when the State made the applicable decision.
- Once the State sets MPLs or determines that source water treatment is not needed, surface water systems or ones using a combined source must monitor annually. The first year begins on the date the State made the applicable decision.
- You can collect source water samples once every 9 years based on SMF compliance cycles, if for 3 ***consecutive*** compliance periods you do not exceed your MPLs (equals 9 years for ground water systems and 3 years for all other systems).
- Your State may allow you to collect source water samples once every 9 years if:
  - you continue to exceed the lead or copper action level and are not required to install source water treatment, but
  - for 3 ***consecutive*** compliance periods your source water lead and copper levels do not exceed 0.005 mg/L and 0.65 mg/L, respectively.
- Once you are on reduced source water monitoring, an exceedance of an action level in lead or copper tap monitoring or an exceedance of an MPL does not alter your monitoring schedule.
- After the State has designated MPLs or determined that you are not required to install source water treatment, you are not required to collect any source water samples during any monitoring period in which your 90th percentile lead or copper levels of tap water samples are at or below their action levels for the entire source water monitoring period in effect.

CHAPTER V: LEAD SERVICE LINE MONITORING AND REPORTING REQUIREMENTS

What Is The Purpose of Collecting Lead Service Line Samples? (See §§141.84(a) - (d)(1))

You must begin replacing lead service lines if you continue to exceed the lead action level after installing corrosion control treatment and/or source water treatment (in whichever sampling occurs later). The State can also require you to begin lead service line replacement if you are required to install corrosion control treatment or source water treatment and have not installed such treatment.

There are two reasons for collecting lead service line samples.

1. To determine if a lead service line must be replaced. You are not required to replace an individual lead service line if the lead concentration of all samples from the line is less than or equal to 0.015 mg/L. This line counts as a replaced line. You are required to replace a minimum of 7 percent of your lead service lines annually for as long as you continue to exceed the lead action level. ***This monitoring is optional***, but it may save you the expense of replacing a lead service line.

2. To determine the impact of partial lead service line replacement on lead levels. Partial lead service line replacement occurs when you do not replace the privately-owned portion of the line, because of legal restrictions or the owner decides not to pay for the replacement of the privately-owned portion. In this event, you must collect a sample that is representative of the water in the service line that you partially replaced and have the sample analyzed for lead within 72 hours after the partial lead service line replacement. ***This monitoring is required.***

Which Systems Must Collect Lead Service Line Samples? (See §§141.84(a) & (d)(1))

Only those systems that are required to replace lead service lines may be required to conduct some lead service line monitoring. As stated above, monitoring to determine whether a line needs to be replaced is optional. However, the cost of a lead analysis is less expensive than the cost to replace a line.

If you replace a line, but do not replace the privately-owned portion of the line, then you must collect a sample that is representative of the water in the service line. This sample is ***not*** required if you replace the ***entire*** lead service line, or if you only replaces a gooseneck, pigtail, or other fittings and these are the only lead components in your service line.

When Do I Collect Lead Service Line Samples? (§§141.84(b) & (e)(3))

The first required year of lead service line replacement begins on the date you exceed the lead action level in tap samples collected after installing corrosion control or source water treatment, whichever is later, or as specified by the State.

You are required to replace at least 7 percent *(or more if required by the State)* of the initial number of lead service lines in your distribution system. The initial number of lead service lines is the number in place at the time the replacement program began. You must continue replacing the required percentage of

lead service lines each year until you no longer exceed the lead action level during ***2 consecutive monitoring*** periods of any duration.

How Do I Collect Lead Service Line Samples? (See §141.86(b)(3))

You can collect these samples using one of the following procedures. For each method, collect a 1-liter sample from the tap by filling the sample bottle to the 1-liter mark, then cap immediately.

- *Flushing a Specified Volume* - The sample should be collected from the building tap which is closest to the portion of the lead service line that was not replaced (i.e., the first tap in the building, most likely a kitchen or bathroom tap on the first floor). Flush the estimated volume of water between the service connection and the sample tap. You can estimate the volume of water by using Table 5-1, Pipe Volume Table. EPA recommends selecting the pipe diameter that is one size larger than the actual pipe size, since pipe material thickness can vary, affecting the interior diameter and the actual volume of water. You can also estimate the volume by measuring the length and diameter of piping from tap to connection and the length and diameter of the service connection itself into a graduated beaker or cylinder to ensure that you have collected the correct volume, then close the tap.
- *Direct Service Line Samples* - In communities where the meters are located outside the buildings (or unmetered areas) service line taps may already exist. Prior to sampling, water should be run to flush the pipe that connects the faucet and the service line. If no tap exists, but the lead service line can be made accessible, a tap constructed of lead-free materials can be installed directly into the line for sample collection purposes. However, because installation of a tap directly into the lead service line could induce additional corrosion activity and is an expensive process as well, this option is not recommended when there are no existing service line taps.
- *Temperature Variation* - This method is recommended if the temperatures of lead service line and interior piping are easily distinguishable (for example in a single-family home). A tap sample should be collected by gently opening the tap and running the water at a normal flow rate, keeping a hand/finger under the flowing water. When a change in water temperature is detected, a 1-liter sample should be collected by filling the sample bottle to the appropriate level and capping.

Table 5-1: Pipe Volume Table (Volumes Listed in Liters)						
Pipe Length (Feet)	**Pipe Diameter (Inches)**					
	3/8	**1/2**	**5/8**	**3/4**	**1**	**1¼**
2	0.06	0.09	0.14	0.19	0.32	0.50
3	0.09	0.14	0.21	0.29	0.49	0.74
4	0.11	0.18	0.27	0.38	0.65	0.99
5	0.14	0.23	0.34	0.48	0.81	1.24
6	0.17	0.27	0.41	0.57	0.97	1.48
7	0.20	0.32	0.48	0.67	1.14	1.73
8	0.23	0.36	0.55	0.76	1.30	1.98
9	0.26	0.41	0.62	0.86	1.46	2.22
10	0.28	0.45	0.69	0.95	1.62	2.47
11	0.31	0.50	0.75	1.05	1.78	2.72
12	0.34	0.55	0.82	1.14	1.95	2.96
13	0.37	0.59	0.89	1.24	2.11	3.21
14	0.40	0.64	0.96	1.33	2.26	3.46
15	0.43	0.68	1.03	1.43	2.43	3.71
16	0.46	0.73	1.10	1.52	2.60	3.95
17	0.49	0.78	1.16	1.62	2.76	4.20
18	0.51	0.82	1.23	1.71	2.92	4.45
19	0.54	0.86	1.30	1.81	3.08	4.70
20	0.57	0.91	1.37	1.90	3.24	4.94
25	0.71	1.14	1.71	2.38	4.06	6.18
30	0.86	1.36	2.06	2.85	4.87	7.41
35	1.00	1.59	2.40	3.33	5.68	8.65
40	1.14	1.82	2.74	3.80	6.49	9.88
60	1.43	2.27	3.43	4.76	8.11	12.36

Notes:

1. Volumes can be added together for pipe lengths not listed.
2. Liters can be converted to gallons by dividing by 3.785.
3. EPA recommends selecting the pipe diameter that is one size larger than the actual pipe size, since pipe material thickness can vary, affecting the interior diameter and the actual volume of water.

Can I Ever Discontinue Lead Service Line Monitoring? (See §141.84(f))

You can discontinue lead service line replacement and thus eliminate any need to conduct lead service line monitoring whenever your 90th percentile lead levels are at or below the lead action level for ***2, consecutive monitoring periods***. You must start replacement again if you subsequently exceed the lead action level during any monitoring period.

REMEMBER: It takes 2, consecutive monitoring periods to stop replacement, but only 1 monitoring period to be triggered back into lead service line replacement.

What Lead Service Line-Related Information Must I Report to the State? (See §141.90)(e))

Within 12 Months of When You Exceed the Lead Action Level

You must provide the State with written demonstration that your materials evaluation was completed, including the evaluation to identify the initial number of lead service lines in your distribution system, as follows:

- Schedule for replacing at least 7 percent each year of the initial number of lead service lines in your distribution system.
- Letter stating for the previous year:
  - the number of lines scheduled that were to be replaced;
  - the number and location of lines actually replaced; and
  - if measured, the water lead concentration and location of each lead service line sampled, the sampling method, and the date of sampling.

This letter is due every 12 months until you complete lead service line replacement or no longer exceed the lead action level during 2, consecutive rounds of tap monitoring.

Newly Required Under the LCRMR

If you do not replace the entire length of the lead service line (i.e., partial replacement), you must provide the following information to the State.

- The analytical results of lead service line samples collected in response to partial lead service line replacement:
  - the results are due within 10 days following the month in which you received these analytical results; and
  - the State can also eliminate the requirement to report these sample results.
- Any additional information as specified by the State, and in a time and manner prescribed by the State, to verify that all partial lead service line replacement activities have taken place.

No Longer Required under LCRMR

Under the LCRMR you are no longer need to provide evidence that you do not control the entire lead service line if you are only replacing a portion of the line. Under the 1991 LCR, you were required to replace the entire line unless you could demonstrate that you did not "control" the entire line. The LCRMR require you to replace the portion that you own versus control, thereby, making this demonstration unnecessary.

What If I Do Not Fulfill My Lead Service Line Replacement Requirements? (See §141.80(k))

You are in violation if you fail to:

- Replace the required number of lead service lines by the annual deadline (i.e., at least 7% annually) (see §§141.84(a) & (b)); ***or***
- Report the required lead service line information on time that demonstrates that the replacement rate was met (see §141.90(e)).

You are also in violation if you do not meet the following partial lead service line replacement requirements (only applicable if you do not replace the entire lead service line) (see §141.84(d)):

- Provide notice and guidance to residents at least 45 days before lead service line replacement begins (unless the State allows a shorter notification period);
- Collect a tap sample within 72 hours of completing the partial lead service line replacement;
- Mail and/or post results of the analysis to the owner and residents within 3 days of receipt of the results; ***or***
- Report information that the State requires to assess whether you met your partial lead service line replacement monitoring and notification requirements.

If you are in violation for any of the above reasons you must:

1. Report the violation to the State within 48 hours of determining the noncompliance (see §141.31(b)).
2. Deliver public notification to your customers (see §141.32 if your State has not adopted the new public notification requirements or §141.201 & 141.203 - 141.206 if your State has adopted these new requirements).
3. Include a discussion of the violation in your consumer confidence report if you are a CWS (see §141.153).

What Provisions of the LCRMR Pertain to Lead Service Line Monitoring and Replacement? (See §141.88(d) & §141.90(e))

The table below summarize each of the LCRMR provisions that impact your lead service line monitoring and replacement requirements. You were required to begin implementing these requirements on April 11, 2000.

You Were Required to Comply with
These Monitoring and Reporting Requirements Beginning April 11, 2000

Under the LCRMR, you:

- Must replace the portion of the lead service line that you own. Under the LCR you were required to replace the portion of the line that you controlled, unless you could demonstrate that you controlled less than the entire line.
- Must notify the owner (or owner's authorized agent) about the replacement, and offer to replace the owner's portion of the line.
- Are not required to pay for replacing the privately-owned portion of the line.
- Are not required to replace the privately-owned portion of the line if precluded by law, or where the owner chooses not to pay the cost of replacing the privately-owned portion.

In those instances where you do not replace the privately-owned portion of the line, you must:

- Notify all residents served by the line you are replacing, at least 45 days prior to partial replacement. The State can allow you to provide less advanced notice if the line is being replaced in conjunction with emergency repairs.
- Collect at your expense ***one*** representative service line sample for each replaced lead service line within 72 hours of removing the line. Under the LCR, you were required to collect a sample from each resident (if the resident(s) so desired) within 14 days of the partial replacement.
- Report sample results to the building owner(s) and the resident(s) served by the partially replaced line within 3 business days of receiving these results. You must notify residents by mail. However, for multi-family dwellings you can post the notification in a conspicuous common-use area of the building.
- Submit these monitoring results to the State within the first 10 days of the month following that in which you receive the results. However, the LCRMR give States the option to modify reporting requirements, so you need to check with your State to be sure of your specific requirements.

What Key Points Should I Remember About Lead Service Line Monitoring and Reporting? (See §§141.84 & 141.86(b)(3))

- ✦ Lead service line replacement is not required unless:
  - You continue to exceed the lead action level in monitoring conducted after you install corrosion control treatment or source water monitoring (whichever occurs later); *or*
  - The State requires it because you have missed your deadline for installing corrosion control treatment or source water treatment.
- ✦ You are not required to replace an individual lead service line if the lead concentration of all samples from the line is less than or equal to 0.015 mg/L. This line counts as a replaced line.
- ✦ If you do not replace the privately-owned portion of a lead service line (also known as partial lead service line replacement), you must collect a sample that is representative of the water in the service line within 72 hours of the replacement.
- ✦ There are 3 methods for collecting a lead service line sample: 1) Flushing a specified volume; 2) Direct service line samples; and 3) Using temperature variation.
- ✦ You can discontinue lead service line replacement and thus, any need to conduct lead service line monitoring whenever your 90th percentile lead levels are at or below the lead action level for 2, consecutive monitoring periods.
- ✦ You must recommence lead service line replacement if you subsequently exceed the lead action level during any monitoring period.

For more information on partial lead service line replacement, refer to: *Notification and Reporting Requirements for Partial Lead Service Line Replacement under the Lead and Copper Rule*, April 2000,
EPA 815-R-99-022

APPENDICES

- Appendix A: List of LCRMR Outreach Materials for Water Systems
- Appendix B: Definitions
- Appendix C: Monitoring Timelines
- Appendix D: Summary of Monitoring and Reporting Violations
- Appendix E: Worksheets and Instructions

APPENDIX A
List of LCRMR Outreach Materials for Water Systems

Below is a comprehensive list of outreach materials that were developed to help you understand and implement the minor revisions to the Lead and Copper Rule.

Guidance Documents

- ✓ *How to Determine Compliance with Optimal Water Quality Parameters as Revised by the Lead and Copper Rule Minor Revisions,* February 2001, EPA 815-R-99-019.
- ✓ *Lead and Copper Rule: Summary of Revisions,* April 2000, EPA 815-R-99-020.
- ✓ *Monitoring Waivers under The Lead and Copper Rule Minor Revisions for Systems Serving 3,300 or Fewer People,* April 2000, EPA 815-R-99-021.
- ✓ *Notification and Reporting Requirements for Partial Lead Service Line Replacement under the Lead and Copper Rule,* April 2000, EPA 815-R-99-022.
- ✓ *Lead in Drinking Water Regulation: Public Education Guidance* (revised), EPA 816-R-02-010

Fact Sheets

- ✓ Fact Sheet for Public Water Systems that Serve 3,300 or Fewer Persons, February 2001, EPA 816-F-00-007.
- ✓ Fact Sheet for Public Water Systems that Serve 3,301 to 50,000 Persons, February 2001, EPA 816-F-00-008.
- ✓ Fact Sheet for Public Water Systems that Serve More Than 50,000 Persons, February 2001, EPA 816-F-00-009.
- ✓ Fact Sheet for Tribal Water System Owners and Operators, February 2001, EPA 816-F-00-010.

Training

- ✓ Comprehensive Lead and Copper Rule Training, January 2001.

You can obtain any of these documents from the Safe Drinking Water Hotline, or the Office of Ground Water and Drinking Water web page at www.epa.gov/safewater/leadcop.html.

APPENDIX B
Definitions

Term	Definition
✎***Note: New terms introduced under the LCRMR are shown in italics.***	
90th Percentile	The highest concentration of lead or copper in tap water that is exceeded by 10 percent of the sites sampled during a monitoring period. This value is compared to the lead or copper action level (AL) to determine whether an AL has been exceeded.
Accelerated Reduced Lead and Copper Tap Monitoring	*Allows water systems with very low levels of lead and copper in their tap water to be placed on a triennial monitor schedule after only 2, consecutive, 6-month monitoring periods. 90th percentile lead level must be ≤ 0.005 mg/L, and 90th percentile copper levels must be ≤ 0.65 mg/L.*
Accelerated Reduced Water Quality Parameter (WQP) Monitoring	*Allows water systems to proceed more quickly to a triennial WQP monitoring schedule. Systems must meet the requirement for accelerated reduced lead and copper levels and be in compliance with their optimal water quality parameter specifications for 2, consecutive monitoring periods (either 6-month or annual periods).*
Action Level (AL)	The concentration of lead or copper in tap water which determines whether a system may be required to install corrosion control treatment, collect WQP samples, collect lead and copper source water samples, replace lead service lines, and/or deliver public education about lead. The action level for lead is 0.015 mg/L or 15 ppb. The action level for copper is 1.3 mg/L or 1300 ppb.
(b)(1) system	A small or medium system that is at or below both action levels during 2, consecutive, 6-month rounds of lead and copper tap monitoring.
(b)(2) system	A systems that is deemed to have optimized corrosion control after demonstrating that it has completed corrosion control treatment steps prior to 12/7/92 that are equivalent to those described in §141.81(b)(2) of the regulation.
(b)(3) system	A system that is deemed to have optimized corrosion control by demonstrating that it has minimal levels of corrosion entering the distribution system based on lead and copper source and tap water samples.
Community Water System (CWS)	A public water system that services at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.
Corrosion Control Treatment	A treatment designed to reduce the dissolving of lead and/or copper in plumbing materials during water delivery to consumers.
Cu	The chemical symbol for copper.
Daily values	*The sample results of WQPs. They are calculated for each WQP at each sampling location. They are based on the sampling frequency for that WQP and sampling point.*
Deemed to have optimized corrosion control	Systems that are delivering minimally corrosive water (i.e., (b)(1), (b)(2), or (b)(3) systems). These systems are subject to fewer monitoring and treatment technique requirements.
Entry Point	Refers to points of entry to the drinking water distribution system from which samples will be representative of each source of supply after treatment.
Exceedance	Occurs when the 90th percentile lead or copper sample is above its respective action level.

Term	Definition
✎***Note: New terms introduced under the LCRMR are shown in italics.***	
Excursion	*Refers to a "daily value" for a WQP at a sampling location that is below the minimum optimal water quality parameter (OWQP) value or outside the range of values designated by the State.*
First-Draw Sample	Refers to a 1-liter sample of tap water that has been standing motionless in plumbing pipes at least 6 hours and is collected without flushing the tap.
Follow-up Monitoring	Refers to the lead and copper tap water and WQP (tap and entry point) monitoring that takes place after corrosion control treatment is in place and before the State determines OWQP ranges or minimums. The samples are taken during the 2, consecutive 6-month monitoring periods immediately following the installation of corrosion control treatment.
Full Waiver	*This waiver allows a small system to collect both lead and copper tap samples at a frequency of once every 9 years at a reduced number of sites. To receive this waiver a system must meet the monitoring and materials criteria for both lead and copper.*
GUDI	An acronym for systems that have been determined to be ground water under the direct influence of surface water.
Initial Tap Monitoring	For systems serving 50,000 or fewer people, refers to the first set(s) of lead and copper tap water samples that are taken at 6-month intervals until which point the system exceeds either action level, or is at or below both action levels for 2, consecutive, 6-month monitoring periods. For systems serving more than 50,000 people, refers to tap samples collected during the first 2, consecutive, 6-month periods of monitoring.
Large Water System	A water system that serves more than 50,000 people.
LCR	An acronym for the Lead and Copper Rule. Also referred to in this document as the 1991 Rule.
LCRMR	*The acronym for the Lead and Copper Rule Minor Revisions.*
Lead Service Line (LSL)	A service line made of lead which connects the water main to the building inlet and any lead pigtail, gooseneck or other fitting which is connected to such lead line.
Materials Survey	Refers to a system's initial evaluation of materials that are contained in its pipes and distribution system in order to identify sites with a high risk of lead and copper occurrence.
Maximum Permissible Levels (MPLs)	The highest allowable lead and copper concentrations after treatment for source water that is entering a water system's distribution system. These levels are determined by the State after it has reviewed source water samples from before and after a system has installed source water treatment, and are set to reflect lead and copper levels from a properly operated and maintained treatment system.
Medium Water System	A water system that serves 3,301 to 50,000 people.
Method Detection Limit (MDL)	The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero.
Monitoring Waiver	*This waiver allows a small system (those serving 3,300 or fewer people) to collect lead and copper tap samples at a frequency of once every 9 years at a reduced number of sites. To receive this waiver a system must meet the monitoring and materials criteria for lead and copper.*
Non-transient, Non-Community Water System (NTNCWSs)	A public water system that is not a community water system and regularly serves at least 25 of the same persons during a minimum of 6 months of each year.

Term	Definition
✎***Note: New terms introduced under the LCRMR are shown in italics.***	
Optimal Corrosion Control Treatment (OCCT)	The corrosion control treatment that minimizes the lead and copper concentrations at users' taps while ensuring that the treatment does not cause the water system to violate any national primary drinking water regulations.
Optimal Water Quality Parameters (OWQPs)	Specific ranges or minimums that are determined by the State for each relevant WQP. OWQPs represent the conditions under which systems must operate their corrosion control treatment to most effectively minimize the lead and copper concentrations at their users' taps.
Partial Wavier	*This type of waiver may be granted if a small system meets the materials and monitoring criteria for either lead or copper, but not both. It allows the system to monitor once every 9 years at a reduced number of sites for the contaminant for which it receives the waiver. The State may elect not to grant partial waivers.*
Pb	The chemical symbol for lead.
Practical Quantitation Level (PQL)	The lowest concentration of an analyte that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions. For lead, the PQL equals 0.005 mg/L; for copper it equals 0.050 mg/L.
Public Water System (PWS)	A system that provides piped water for human consumption, which has at least 15 service connections or regularly serves an average of at least 25 individuals daily for at least 60 days of the year. It includes: 1) the collection, treatment, storage, and distribution facilities operated and used by the system, and 2) any collection or pretreatment storage facilities not under the control of the system, but which it primarily uses.
Reduced Monitoring	Refers to the sampling frequency and number of monitoring sites from which a system must collect lead and copper tap samples or WQP distribution samples after it has met the criteria that is specified under §141.86(d)(4) or §141.97(e), respectively. After meeting any one of these criteria, systems are allowed to sample from a reduced number of monitoring sites and/or at a reduced frequency.
Representative Site	*A sampling site that is connected to plumbing materials which are similar to materials used at other sites in the water system.*
Service Line Sample	A 1-liter sample of water, collected in accordance with §141.86(b)(3), that has been standing for at least 6 hours in a lead service line.
Single Family Residences (SFRs)	Single family residence structures which can include for purposes of identifying targeted sampling locations: (1) Non-Residential structures; and (2) Multi-Family Residences (MFRs) if they constitute more than 20% of the service connections within the system's service area.
Single Family Structure	A building constructed as a single-family residence that is currently used as either a residence or a place of business.
Small Water System	A water system that serves 25 to 3,300 people.
Solder	A metallic compound used to seal joints in plumbing. Until the lead ban took effect, most solder contained about 50 percent lead.
Source Water Sample	A sample collected at entry point(s) to the distribution system representative of each source of supply after treatment.
Source Water Treatment	Treatment designed to remove lead and/or copper from the source of the water supply.

Term	Definition
✎***Note: New terms introduced under the LCRMR are shown in italics.***	
Special-Case CWS	*A facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices; and the water system supplies water as part of the cost of services provided and does not separately charge for water consumption. For certain monitoring and public education requirements, these systems may be treated like an NTNCWS.*
Standard Monitoring	Refers to the monitoring frequency and number of monitoring sites from which a system must collect samples before a system has qualified to go to a reduced monitoring schedule. Standard monitoring is conducted at 6-month intervals.
Tier 1 Site	For a CWS, it is a single family structure that contains lead pipes, or copper pipes with lead solder installed after 1982, and/or is served by lead service lines. For an NTNCWS, it is a building that contains copper pipes with lead solder installed after 1982, and/or is served by lead service lines.
Tier 2 Site	For a CWS, it is a building and multiple-family residence that contains lead pipes, or copper pipes with lead solder installed after 1982, and/or is served by lead service lines. For an NTNCWS, it is a building that contains copper pipes with lead solder installed before 1983.
Tier 3 Site	Applies only to a CWS, and is a single family structures that contain copper pipes with lead solder installed before 1983.
Water Distribution System	Refers to the piping, devices, and related fittings that are used to carry a system's drinking water to its users. It includes the treatment plant, distribution system, water meter, water meter setting equipment, piping and plumbing that conveys drinking water, and individual fixtures.
Water Quality Parameters (WQPs)	Used to help systems and States determine what levels of corrosion control treatment would work best for the system and whether this treatment is being properly operated and maintained over time. WQPs include: pH, temperature, conductivity, alkalinity, calcium, orthophosphate, and silica.

APPENDIX C
Monitoring Timelines

- **Lead and Copper Tap and WQP Monitoring Schedule for Large Water Systems (> 50,000)**
  This timeline illustrates the schedule for corrosion control treatment (CCT), lead and copper tap monitoring, and WQP monitoring for (b)(3) and non-(b)(3) large systems.

- **Lead and Copper Tap Schedule for Medium Water Systems (3,301 - 50,000) that Do Not Exceed An Action Level**
  This timeline shows the lead and copper monitoring requirements for medium water systems that do not exceed an action level.

- **Lead and Copper Tap and WQP Monitoring Schedule for Medium Water Systems (3,301 - 50,000) that Exceed An Action Level (No Longer Exceed After Installing Treatment)**
  This timeline illustrates the CCT and monitoring schedule for medium systems that no longer exceed an action level after treatment.

- **Lead and Copper Tap and WQP Monitoring Schedule for Medium Water Systems (3,301 - 50,000) that Exceed An Action Level (Continue to Exceed After Installing Treatment)**
  This timeline shows the CCT and monitoring schedule for medium water systems that continue to exceed an action level after CCT.

- **Lead and Copper Tap Schedule for Small Water Systems (≤ 3,300) that Do Not Exceed An Action Level**
  This timeline shows the lead and copper monitoring requirements for small water systems that do not exceed an action level.

- **Lead and Copper Tap and WQP Monitoring Schedule for Small Water Systems (≤ 3,300) that Exceed An Action Level (No Longer Exceed After Installing Treatment)**
  This timeline illustrates the CCT and monitoring schedule for small systems that no longer exceed an action level after treatment.

- **Lead and Copper Tap and WQP Monitoring Schedule for Small Water Systems (≤ 3,300) that Exceed An Action Level (Continue to Exceed After Installing Treatment)**
  This timeline illustrates the CCT and monitoring schedule for small systems that continue to exceed an action level after installing CCT.

Insert file (revised mon timelines)

APPENDIX D
Summary of Monitoring and Reporting Violations

Monitoring and Reporting (M/R) violations fall into four major categories as described below.

1. M/R for lead and copper at customers' taps

You are in violation if you do not meet all of the following monitoring and reporting requirements within the time frame specified by the rule:

- Use appropriate sampling procedures in accordance with §§141.86(a) and (b);
- Collect the required number of samples during the specified time frame in accordance with §§141.86(c) and (d);
- Ensure samples are analyzed properly in accordance with §141.89(a);
- Submit all required monitoring information on time in accordance with §141.90(a); ***or***
- Report a change in treatment, or an addition of a new source, within 60 days or within the time frame specified by the State, if you are on reduced monitoring, have a waiver, or are a (b)(3) system, as required by §141.90(a)(3).

Depending on whether the State adopts the less stringent provisions of the LCRMR into its revised drinking water regulation, you may also be in violation if you do not meet the following requirements within the timeframe specified by the rule:

- Meet replacement sample requirements for invalidated samples as described in §141.86(f)(4) where these samples are needed to meet minimum sampling requirements;
- Meet the conditions of your monitoring waivers in §141.86(g) or provide the required information in §§141.90(a)(4)(ii)-(iv);
- Provide sample information needed for your State to perform the 90th percentile calculation as outlined in §141.90(h);
- Collect non-first draw samples that did not meet the criteria in §141.86(b)(5); ***or***
- Meet the monitoring deadline for transitioning to an alternate period (i.e., months other than June through September) for collecting reduced lead and copper tap samples, as specified in §141.86(d)(4)(iv)(B).

2. M/R for WQPs at entry points and taps in the distribution system

You are in violation if you do not meet all of the following monitoring and reporting requirements within the time frame specified by the rule:

- Use appropriate sampling procedures in accordance with §§141.87(a)(1);
- Collect the required number and type of samples in accordance with §§141.87(a)(2),(b)-(e);
- Ensure samples are analyzed properly in accordance with §141.89(a);
- Submit all required monitoring information on time in accordance with §141.90(a)(vi)-(viii);
- Meet the State-approved sampling plan for collecting WQPs at representative entry point locations in accordance with §§141.87(c)(3) *(this criterion would only apply if you are a ground water system and your State's regulation allows you to limit entry point WQP monitoring to representative sites).*

2. M/R for WQPs at entry points and taps in the distribution system (continued)

APPENDIX D
Summary of Monitoring and Reporting Violations

Monitoring and Reporting (M/R) violations fall into four major categories as described below.

In addition, you are in violation if you do not meet your OWQP ranges or minimums set by the State as follows:

- If your State assesses compliance using the 1991 LCR procedure, you are out of compliance if the results of any WQP sample, or the average of the original sample and a confirmation sample, does not meet the State-designated OWQP ranges or minimums.
- If your State assesses compliance using the LCRMR, you are in violation of your requirements if you have OWQP excursions for more than 9 days in a 6-month compliance period.

3. M/R for lead and copper in source water

You are in violation if you do not meet all of the following monitoring and reporting requirements within the time frame specified by the rule:

- Use appropriate sampling procedures (see §§141.88(a)(1) and (2));
- Collect the required number of source water samples (see §§141.88(a)(1) - (e));
- Ensure samples are analyzed properly (see §141.89(a)); ***or***
- Submit all required sampling information on time (see §141.90(b)).

In addition, you are in violation if you do not meet your State-designated or approved MPLs (see §141.88(a)(2)) *(Note: If you are above either MPL, you can take a confirmation sample within 2 weeks of the original sample, if allowed by the State. The results of the original and confirmation samples are averaged to determine whether you are in compliance with your MPLs*)

4. M/R for lead and other requirements associated with lead service line replacement

You are in violation if you do not:

- Replace the required number of lead service lines by the annual deadline (i.e., at least 7% annually) (see §§141.84(a) & (b)); ***or***
- Report the required lead service line information on time that demonstrates that you replaced the required number of lead service lines by the annual deadline (see §141.90(e))

You are also in violation if you do not meet the following partial lead service line replacement requirements *(only applicable if you do not replace the entire lead service line) (see §141.84(d))*:

- Provide notice and guidance to residents at least 45 days before lead service line replacement begins (unless the State allows a shorter notification period);
- Collect a tap sample within 72 hours of completing the partial lead service line replacement;
- Mail and/or post results of the analysis to the owner and residents within 3 days of receipt of the results; ***or***
- Report information that the State requires to assess whether you met your partial lead service line replacement monitoring and notification requirements.

APPENDIX E
Worksheet and Instructions

- **Worksheet 1: Materials Survey Investigation Results**
  This worksheet can be used to record information about sampling sites based on your materials investigation (e.g., presence of lead service lines (LSLs), contact information).

- **Worksheet 2: Materials Survey Results by Number of Service Connections for each Plumbing Materials Type**
  This worksheet allows you to record the number of service connections by type of structure (i.e., single or multi-family residence, or public/commercial buildings) and the type of interior and distribution system plumbing materials (e.g., copper pipe with lead solder, LSL).

- **Worksheet 3: Summary of Material Survey Results**
  This worksheet allows you to tally the number of service connections by type of structure and type of plumbing material.

- **Suggested Directions for Homeowner Tap Sample Collection Procedures**
  This page provides suggested language that you can use when instructing homeowners on the proper procedure for collecting lead and copper tap samples.

- **Form 141-A: Sample Site Identification and Certification**
  This form is used to identify: the number of sites that meet the tiering criteria; a certification that each sample was collecting using proper sampling procedures; your 90th percentile calculations and the number of samples upon which these levels are based; the number of WQPs sample collected vs. the number of required samples; and an explanation of any changes in sampling locations.

- **Amended Form 141-A: Sample Site Identification and Certification**
  This version of Form141-A deletes those certifications which are no longer required under the LCRMR. However, you must first check with your State before using this form.

- **Form 141-B: Request for Reduced Lead and Copper Tap Monitoring**
  This form can be used to request permission from the State to collect lead and copper tap samples at a reduced number and frequency based on your continued compliance with your OWQPs. The LCRMR no longer require you to submit a formal request for reduced monitoring; however, first check with your State to determine if this requirement still applies.

- **Form 141-C: Optimal Corrosion Control Treatment Recommendation**
  This 2-page form has several applications. It can be used to: 1) document the results of monitoring used to evaluate various corrosion control treatment (CCT) options and to provide your study recommendation, 2) certify that you have properly installed CCT, or 3) request a modification to your State's decision regarding CCT and/or OWQPs.

- **Form 141-D: Source Water Monitoring and Treatment**
  This form is similar to Form 141-C. It can be used to: 1) document your initial source water monitoring and source water treatment (SOWT) recommendation; 2) certify that you have properly installed SOWT; or 3) request a modification to the State's decision regarding SOWT or MPLs.

WORKSHEET #1
MATERIALS SURVEY INVESTIGATION RESULTS

PWS ID NUMBER

POPULATION SERVED BY PWS

Type of Structure	Location	Contact Person		LSL	Home Plumbing Material	Verified	Volunteered	Selected		Received Training Material
		Name	Phone					Routine	Optional	

WORKSHEET #2

MATERIALS SURVEY RESULTS BY NUMBER OF SERVICE CONNECTIONS FOR EACH PLUMBING MATERIALS TYPE

PWS ID NUMBER _____

POPULATION SERVED BY PWS _____

Type of Structure	Type of Plumbing Material				
	Interior Plumbing			Distribution System Piping	
	Lead Pipe	Copper with Lead Solder >1982[4]	Copper with Lead Solder <1983[5]	LSLs	
				Entire Line	Partial Line
	Number of Service Connections			Number of Service Connections	
SFRs[1]					
MFRs[2]					
BLDGs[3]					
TOTAL					

[1] SFR - single family residence
[2] MFR - multi-family residence
[3] BLDG - public or commercials buildings
[4] Refers to buildings that contain copper pipes with lead solder installed after 1982.
[5] Refers to buildings that contain copper pipes with lead solder installed before 1983.

WORKSHEET #3
SUMMARY OF MATERIALS SURVEY RESULTS

PWS ID NUMBER _____

POPULATION SERVED BY PWS _____

Plumbing Material	Type of Structure		
	SFR[1]	MFR[2]	BLDG[3]
	Number of Service Connections		
Interior Plumbing			
Lead Pipe			
Copper Pipe With Lead Solder >1982[4]			
Copper Pipe With Lead Solder <1983[5]			
Service Lines			
LSLs			
Entire Line			
Partial Line			
Total Available Sites			

[1] SFR - single family residence
[2] MFR - multi-family residence
[3] BLDG - public or commercials buildings
[4] Refers to buildings that contain copper pipes with lead solder installed after 1982.
[5] Refers to buildings that contain copper pipes with lead solder installed before 1983.

Suggested Directions for
Homeowner Tap Sample Collection Procedures

These samples are being collected to determine the lead and copper levels in your tap water. This sampling effort is required by the U.S. Environmental Protection Agency and your State, and is being accomplished through the cooperation of homeowners and residents.

Collect samples from a tap that has not been used for a minimum of 6 hours. Because of this requirement, the best time to collect samples is either early in the morning or in the evening upon returning from work. Be sure to use taps that have been in general use by your household for the past few months. The collection procedure is described in more detail below.

1. Prior arrangements will be made with the customer to coordinate the sample collection event. Dates will be set for sample kit delivery and pick-up by water department staff.
2. There must be a minimum of 6 hours during which there is no water used from the tap the sample is taken from and any taps adjacent or close to that tap. The water department recommends that either early mornings or evenings upon returning home are the best sampling times to ensure that the necessary stagnant water conditions exist.
3. A kitchen or bathroom cold-water faucet is to be used for sampling. If you have water softeners on your kitchen taps, collect your sample from the bathroom tap that is not attached to a water softener, if possible. Place the opened sample bottle below the faucet and gently open the cold water tap. Fill the sample bottle to the line marked "1000-mL" and turn off the water.
4. Tightly cap the sample bottle and place in the sample kit provided. Please review the sample kit label at this time to ensure that all information contained on the label is correct.
5. ***IF ANY PLUMBING REPAIRS OR REPLACEMENT HAS BEEN DONE IN THE HOME SINCE THE PREVIOUS SAMPLING EVENT, NOTE THIS INFORMATION ON THE LABEL AS PROVIDED. ALSO IF YOUR SAMPLE WAS COLLECTED FROM A TAP WITH A WATER SOFTENER, NOTE THIS AS WELL.***
6. Place the sample kit outside of the residence in the location of the kit's delivery so that department staff may pick up the sample kit.
7. Results from this monitoring effort will be provided to participating customers when reports are generated for the State. However, if excessive lead and/or copper levels are found, immediate notification will be provided (usually 10 working days from the time of sample collection).

Call _____ at _____if you have any questions regarding these instructions.

TO BE COMPLETED BY RESIDENT

Water was last used: Time_____ Date_____

Sample was collected: Time_____ Date_____

I have read the above directions and have taken a tap sample in accordance with these directions.

_____ _____

Signature Date

SAMPLE SITE IDENTIFICATION AND CERTIFICATION

System's Name: _____ **System Type:** ☐ CWS ☐ NTNCWS

Address: _____ **Number of People Served:**

_____ ☐ >100,000 ☐ 501 to 3,300

☐ 10,001 to 100,000 ☐ 101 to 500

_____ ☐ 3,301 to 10,000 ☐ ≤100

System ID:_____

Contact Person:_____ **Telephone number:** _____

CERTIFICATION OF SAMPLING SITES

LEAD SOLDER SITES

# of single-family structures with copper pipes with lead solder installed after 1982 or lead pipes and/or lead service lines (Tier 1) _____

# of multi-family structures with copper pipes with lead solder installed after 1982 or lead pipes and/or lead service lines (Tier 1) _____

# of buildings containing copper pipes with lead solder installed after 1982 or lead pipes and/or lead service lines (Tier 2) _____

# of sites that contain copper pipes with lead solder installed before 1983 (Tier 3) _____

# of sites that do not meet Tier 1, 2, or 3 criteria *(to be used only if other conditions have been exhausted)* _____

TOTAL _____

The following sources have been explored to determine the number of structures which have interior lead pipe or copper pipe with lead solder.

_____ **Plumbing and/or building codes**

_____ **Plumbing and/or building permits**

_____ **Contacts within the building department, municipal clerk's office, or State regulatory agencies for historical documentation of the service area development**

_____ **Water Quality Data**

Other Resources Which PWS May Utilize

_____ **Interviews with building inspectors**

_____ **Survey of service area plumbers about when and where lead solder was used from 1982 to present**

_____ **Survey residents in sections of the service area where lead pipe and/or copper pipe with lead solder is suspected to exist**

_____ **Interviews with local contractors and developers**

Explanation of Tier 2 and Tier 3 sites (attach additional pages if necessary) _____

_____

SAMPLE SITE IDENTIFICATION AND CERTIFICATION

CERTIFICATION OF SAMPLING SITES

LEAD SERVICE LINE SITES

# of samples required to be drawn from lead service line sites _____

# of samples actually drawn from lead service line sites _____

Difference (explain differences other than zero) _____

The following sources have been explored to determine the number of lead service lines in the distribution system.

_____ Distribution system maps and record drawings

_____ Information collected for the presence of lead and copper as required under §141.42 of the Code of Federal Regulations

_____ Capital improvement plans and/or master plans for distribution system development

_____ Current and historical standard operating procedures and/or operation and maintenance (O&M) manuals for the type of materials used for service connections

_____ Utility records including meter installation records, customer complaint investigations and all historical documentation which indicate and/or confirm the location of lead service connections

_____ Existing water quality data for indications of 'troubled areas'

Other Sources Which PWS Utilized

_____ Interviews with senior personnel

_____ Conduct service line sampling where lead service lines are suspected to exist but their presence is not confirmed

_____ Review of permit files

_____ Community survey

_____ Review of USGS maps and records

_____ Interviews with pipe suppliers, contractors, and/or developers

Explanation of fewer than 50% LSL sites identified (attach additional pages if necessary):_____

_____

_

CERTIFICATION OF COLLECTION METHODS

I certify that:

- Each first draw tap sample for lead and copper is 1 liter in volume and has stood motionless in the plumbing system of each sampling site for at least 6 hours.
- Each first draw sample collected from a single-family residence has been collected from the cold water kitchen tap or bathroom sink tap.
- Each first draw sample collected from a non-residential building has been collected at an interior tap from which water is typically drawn for consumption.
- Each first-draw sample collected during an annual or triennial monitoring period has been collected in the months of June, July, August, or September or in the alternate period specified by the State.
- Each resident who volunteered to collect tap water samples from his or her home has been properly instructed by [insert water system's name] _____ in the proper methods for collecting lead and copper samples. I do not challenge the accuracy of those sampling results. Enclosed is a copy of the material distributed to residents explaining the proper collection methods, and a list of the residents who performed sampling.

SAMPLE SITE IDENTIFICATION AND CERTIFICATION

RESULTS OF MONITORING

THE RESULTS OF LEAD AND COPPER TAP WATER SAMPLES MUST BE ATTACHED TO THIS DOCUMENT

# of samples required _____ **# of samples submitted** _____

90th Percentile Pb _____ **90th Percentile Cu** _____

Note: If the State has informed you that it will calculate your 90th percentile levels, you do not need to submit the 90th percentile calculations. However, you must still provide your sample results to the State by the deadline that they have specified.

THE RESULTS OF WATER QUALITY PARAMETER SAMPLES MUST BE ATTACHED TO THIS DOCUMENT

# of WQP tap samples required _____ **# of WQP tap samples submitted** _____

# of entry point samples required _____ **# of entry point samples submitted** _____

CHANGE IN SAMPLING SITES

Original site address: _____

_____

_____

New site address: _____

_____

_____

Distance between sites (approximately): _____

Targeting Criteria: **NEW:** _____ **OLD:** _____

Reason for change (attach additional pages if necessary)_____

_____

_____

_____

_____

SIGNATURE

_____ _____ _____

PRINTED NAME **TITLE** **DATE**

✎ **Note: The LCRMR no longer require you to complete the certification of sampling sites, or certification of collection methods. A modified version of Form 141-A is provided below. This revised form deletes those certifications that are no longer required under the LCRMR. Please check with your State before using the amended Form 141-A.**

Amended Form 141-A **Page 1 of 2**

SAMPLE SITE IDENTIFICATION AND CERTIFICATION

System's Name: _____ **System Type:** ☐ **CWS** ☐ **NTNCWS**

Address: _____ **Number of People Served:**

_____ ☐ **>100,000** ☐ **501 to 3,300**

_____ ☐ **10,001 to 100,000** ☐ **101 to 500**

☐ **3,301 to 10,000** ☐ **≤100**

System ID #: _____

Contact Person: _____ **Telephone number:** _____

RESULTS OF MONITORING

THE RESULTS OF LEAD AND COPPER TAP WATER SAMPLES MUST BE ATTACHED TO THIS DOCUMENT

# of samples required _____ **# of samples** _____

90th Percentile Pb _____ **90th Percentile Cu** _____

Note: If the State has informed you that it will calculate your 90th percentile levels, you do not need to submit the 90th percentile calculations. However, you must still provide your sample results to the State by the deadline that they have specified.

THE RESULTS OF WATER QUALITY PARAMETER SAMPLES MUST BE ATTACHED TO THIS DOCUMENT

# of WQP tap samples required _____ **# of WQP tap samples submitted** _____

# of entry point samples required _____ **# of entry point samples submitted** _____

SAMPLE SITE IDENTIFICATION AND CERTIFICATION

CHANGE IN SAMPLING SITES

Original site address: _____

_____

_____

New site address: _____

_____

_____

Distance between sites (approximately): _____

Targeting Criteria: **NEW:** _____ **OLD:** _____

Reason for change (attach additional pages if necessary)_____

_____

_____

_____

_____

SIGNATURE

_____ _____ _____

PRINTED NAME **TITLE** **DATE**

✎ **Note:** The LCRMR no longer require a system, which is in compliance with its OWQPs, to submit a written request to its State to allow it to collect lead and copper tap samples at a reduced number and frequency. Therefore, this or a similar form may no longer be required by your State. **Please note** that this form ***cannot*** be used to request a monitoring waiver. Monitoring waiver forms are provided in the guidance document, *Monitoring Waivers under the Lead and Copper Rule Minor Revisions for Systems Serving 3,300 or Fewer People,* April 2000, EPA 815-R-99-021.

Form 141-B **Page 1 of 1**

REQUEST FOR REDUCED LEAD AND COPPER TAP WATER

System's Name: _____ **System Type:** ☐ **CWS** ☐ **NTNCWS**

Address: _____

_____

_____

Number of People Served:

☐ **>100,000** ☐ **501 to 3,300**
☐ **10,001 to 100,000** ☐ **101 to 500**
☐ **3,301 to 10,000** ☐ **≤100**

System ID #: _____

Contact Person: _____ **Telephone number:** _____

The _____ **water system hasoperated in accordance with the State-specified water quality parameters during each of the following monitoring periods. The above named water system hereby requests that the State permit the system to reduce lead and copper tap water monitoring from:**

☐ **Biannual to Annual**
or
☐ **Annual to Triennial**

☐ **100 to 50**
☐ **60 to 30**
☐ **40 to 20**
☐ **20 to 10**
☐ **10 to 5**

The results of all water quality parameter samples and lead and copper tap water samples collected during each of the monitoring periods are summarized and attached.

_____

SIGNATURE

_____ _____ _____

PRINTED NAME **TITLE** **DATE**

OPTIMAL CORROSION CONTROL TREATMENT RECOMMENDATION

System's Name: _____ System Type: ☐ CWS ☐ NTNCWS

Address: _____ Number of People Served:

_____ ☐ >100,000 ☐ 501 to 3,300

_____ ☐ 10,001 to 100,000 ☐ 101 to 500

☐ 3,301 to 10,000 ☐ ≤100

System ID #:

Contact Person: _____ Telephone number: _____

RESULTS OF MONITORING

The Results of Source Water, Tap Water, and WQP Samples Must Be Attached to This Document

# of tap water samples required _____ # of tap water samples submitted _____

# of source water samples required _____ # of source water samples submitted _____

RESULTS OF OPTIMAL CORROSION CONTROL TREATMENT STUDIES

(If the State requires you to conduct additional treatment analyses, copy this form and attach the results.)

Test 1 — Alkalinity & pH Adjustment			Test 2 — Calcium Hardness Treatment		
Before	Parameters	After	Before	Parameters	After
_____	Pb	_____	_____	Pb	_____
_____	Cu	_____	_____	Cu	_____
_____	pH	_____	_____	pH	_____
_____	alkalinity	_____	_____	alkalinity	_____
_____	calcium	_____	_____	calcium	_____
_____	conductivity	_____	_____	conductivity	_____
_____	orthophosphate	_____	_____	orthophosphate	_____
_____	silicate	_____	_____	silicate	_____
_____	water temperature	_____	_____	water temperature	_____

Test 3 — Addition of Corrosion Inhibitor			Test 4 —		
Before	Parameters	After	Before	Parameters	After
_____	Pb	_____	_____	Pb	_____
_____	Cu	_____	_____	Cu	_____
_____	pH	_____	_____	pH	_____
_____	alkalinity	_____	_____	alkalinity	_____
_____	calcium	_____	_____	calcium	_____
_____	conductivity	_____	_____	conductivity	_____
_____	orthophosphate	_____	_____	orthophosphate	_____
_____	silicate	_____	_____	silicate	_____
_____	water temperature	_____	_____	water temperature	_____

OPTIMAL CORROSION CONTROL TREATMENT RECOMMENDATION

CORROSION CONTROL TREATMENT RECOMMENDATION

1. **Treatment recommendation and rationale:**

_____

_____

2. **Test methodologies used to evaluate each treatment (e.g., pipe rig loop tests, metal coupon tests, etc.):**

_____

_____

3. **Identify any chemical or physical constraint that limits or prohibits the use of a particular corrosion control treatment (attach all data indicating that a particular treatment has adversely affected other water treatment processes or is ineffective for reducing corrosion):**

_____

_____

CERTIFICATION THAT OPTIMAL CORROSION CONTROL TREATMENT HAS BEEN INSTALLED

The _____ water system certifies that optimal corrosion control treatment has been installed and is being properly operated as agreed to between the above named water system and the State of _____. Optimal corrosion control treatment was required to be installed by _____ (date). Optimal corrosion control treatment was installed on _____ (date).

REQUEST FOR MODIFICATION OF CURRENT CORROSION CONTROL TREATMENT AND/OR WATER QUALITY PARAMETERS

Reason for modification:_____

_____

(Attach all supporting studies, data, treatment specifications, etc., that substantiate this request for modification.)

_____

SIGNATURE

_____ _____ _____

PRINTED NAME **TITLE** **DATE**

SOURCE WATER MONITORING AND TREATMENT

System's Name: _____

System Type: ☐ CWS ☐ NTNCWS

Address: _____

_____

_____

Number of People Served:

☐ >100,000
☐ 10,001 to 100,000
☐ 3,301 to 10,000
☐ 501 to 3,300
☐ 101 to 500
☐ ≤100

System ID #:

Contact Person: _____

Telephone number: _____

SOURCE WATER DATA

Attach all data collected at all entry points to the distribution system. List the highest values obtained in sampling for this monitoring period and attach the results of all other samples collected at each entry point.

Entry Point Location	Lead Values (in mg/L)	Copper Values (in mg/L)
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

SOURCE WATER MONITORING AND TREATMENT

SOURCE WATER TREATMENT RECOMMENDATION

Treatment recommendation: _____

_____

Reason for treatment/no treatment recommendation: ***(Attach additional pages as needed.)***

_____

_____

CERTIFICATION THAT SOURCE WATER TREATMENT HAS BEEN INSTALLED

The _____ water system certifies that source water treatment has been installed and is being properly operated as agreed to between the above named water system and the State of _____. Water treatment was required to be installed by _____ (date). Source water treatment was installed on _____ (date).

REQUEST FOR MODIFICATION OF STATE TREATMENT DECISION AND/OR MAXIMUM PERMISSIBLE LEAD AND COPPER LEVELS

Reason for modification: _____

_____

(Attach all supporting studies, data, treatment specifications, etc., that substantiate this request for modification.)

_____

SIGNATURE

_____ _____ _____

PRINTED NAME **TITLE** **DATE**