



Lead & Copper Rule Midwest Assistance Program (MAP)

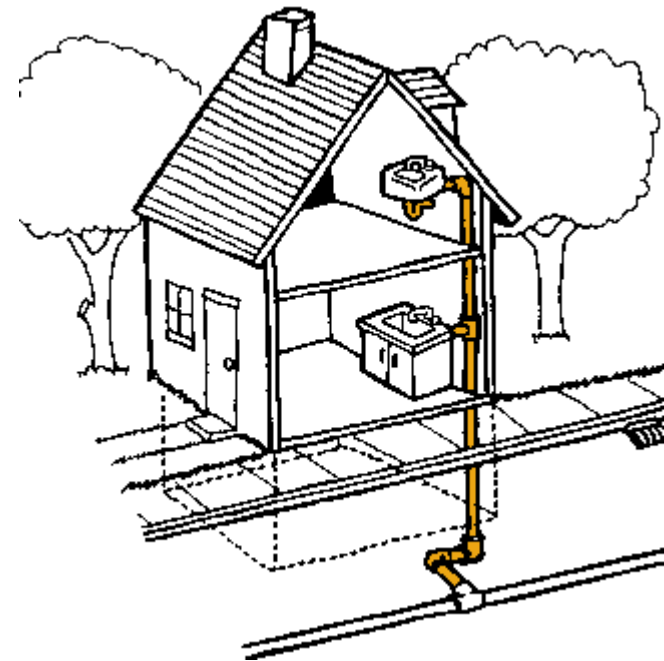
US EPA R8 Drinking Water Program

Chelsea Ransom

April 2023

Agenda

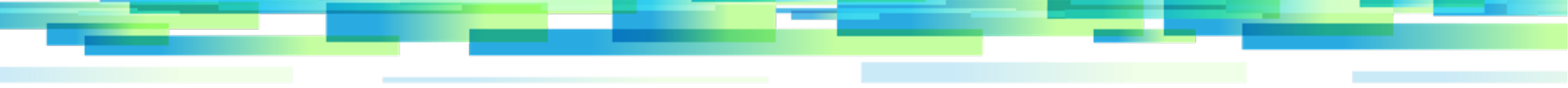
- Health Impacts of Lead and Copper
- Sources of Lead
- Lead and Copper Rule (LCR) Overview
- Monitoring Schedules
- Tap Sampling Protocol
- Sampling Plans
- Sample Invalidation
- Lead Consumer Notices
- Action Level Exceedances



Disclaimer

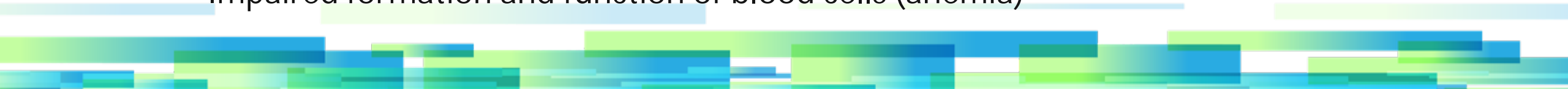
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Health Impacts

Impacts of Lead


- There is no safe level of lead
 - Young children, infants, and fetuses are particularly vulnerable to lead because the physical and behavioral effects of lead occur at lower exposure levels in children than in adults.
 - A dose of lead that would have little effect on an adult can have a significant effect on a child.
 - Low levels of exposure in children have been linked to:
 - Damage to central and peripheral nervous system
 - Learning disabilities
 - Lower IQ and hyperactivity
 - Shorter stature
 - Impaired hearing
 - Impaired formation and function of blood cells (anemia)
- 

Impacts of Lead Continued


- **Pregnant women**

- Lead accumulates in body over time where its stored in the bones with calcium
- During pregnancy the lead is released from the maternal bones and is used to develop the bones of the fetus
- Lead can cross the placenta to the fetus
- Risks include:
 - Reduced growth
 - Premature birth

- **Adults**

- Cardiovascular effects – increased blood pressure
 - Decreased Kidney Function
 - Reproductive problems in both men and women
- 


Impacts of Copper

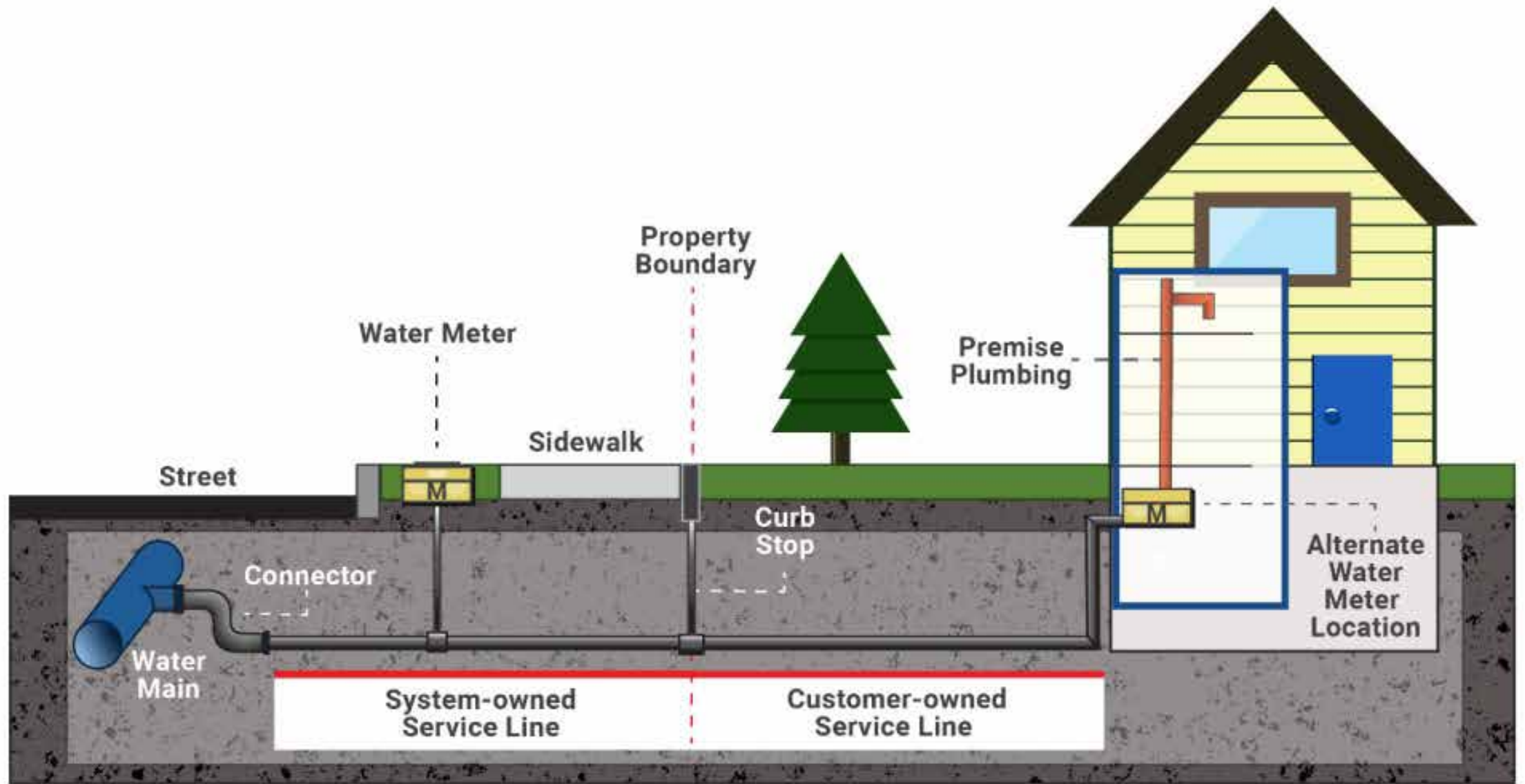
- Stomach and Intestinal Distress
 - Nausea, vomiting, diarrhea, stomach cramps
 - Complications of Wilson's Disease
 - Chronic exposure can cause liver disease in genetically predisposed people
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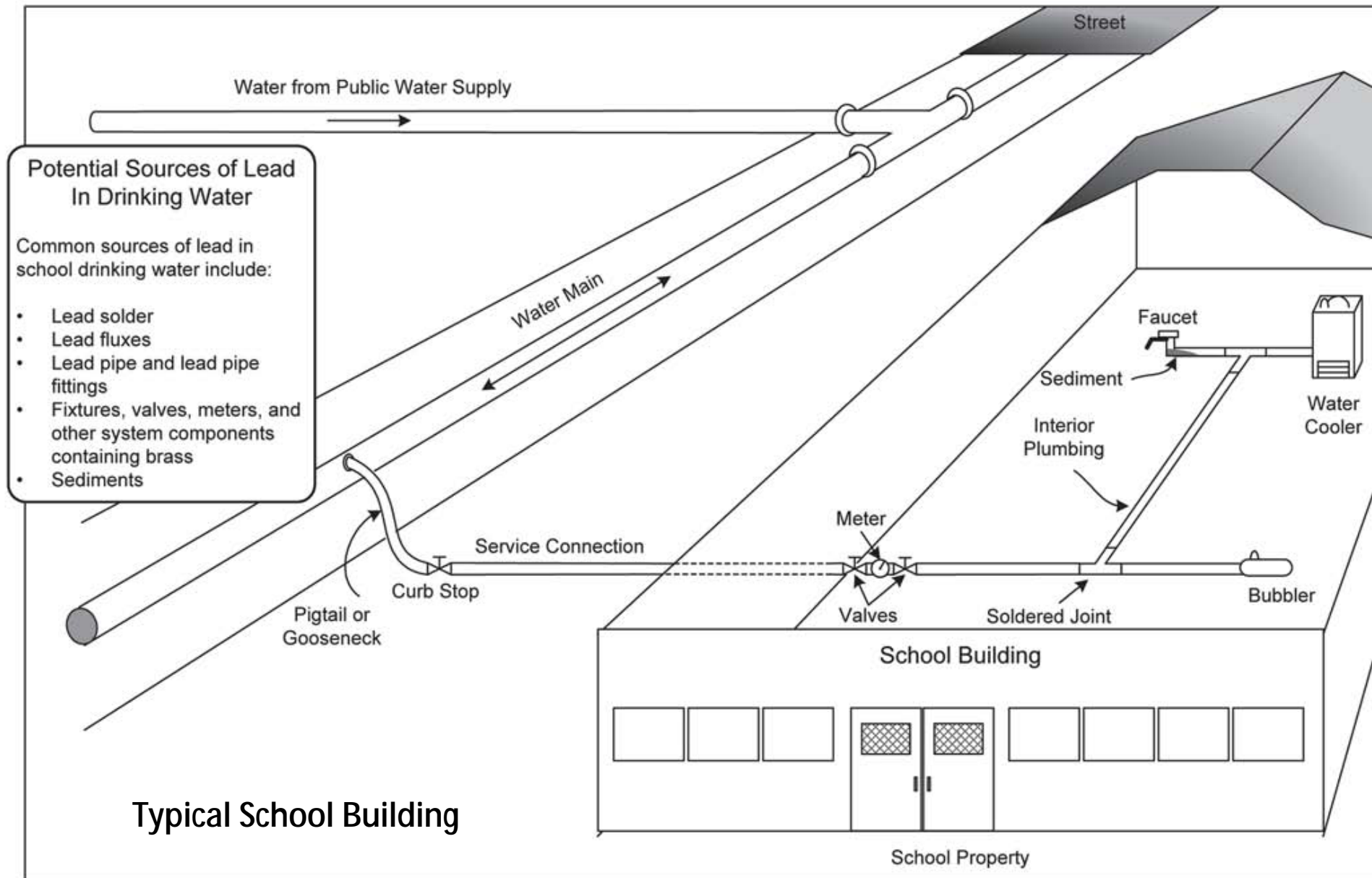


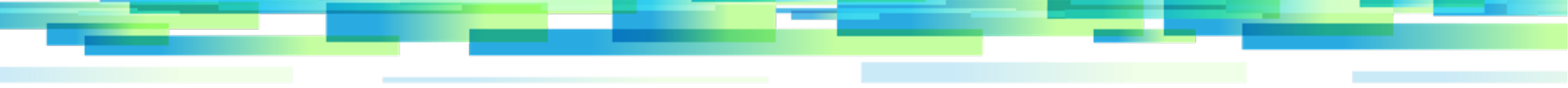
Sources of Lead

Sources of Lead

- Paint
 - Soil and the yard around the home if the home has exterior lead based paint.
 - Hunting ammunition
 - Fishing Tackle
 - Stained Glass
 - Dyes and glazes used in pottery
 - Old children's toys and toy jewelry
 - Drinking water
- 








LCR Overview

Lead and Copper Rule Overview

- The Lead and Copper Rule (LCR) was originally promulgated in 1991
 - Applies to Community (CWS) & Non-transient Non-community (NTNC) Public Water Systems (PWS)
 - Transient Water Systems are not required to comply with LCR
 - The Lead and Copper Rule Revisions require an initial inventory to be submitted, due October 16, 2024
 - The LCR Improvements are under development and are expected to be released by end of summer 2023 (September)
 - This presentation is focused on the Current LCR
- 



Monitoring Schedules

Monitoring Schedules

- Standard (6-month) – New Systems, Systems that Exceed the AL, Systems that Fail to monitor 2x, treatment or source changes
- Reduced Monitoring – Annual or Triennial
- Number of samples is based on the sum of Residential and Non-Transient population

| System Population | Minimum Number of Tap Sample Sites | |
|-------------------|------------------------------------|--------------------|
| | Standard Monitoring | Reduced Monitoring |
| 10,001 to 100,000 | 60 | 30 |
| 3,301 to 10,000 | 40 | 20 |
| 501 to 3,300 | 20 | 10 |
| 101 to 500 | 10 | 5 |
| Less than 101 | 5 | 5 |

Monitoring Schedules

Standard (6-month) Monitoring Periods

- Sample between Jan 1 and June 30; July 1 and Dec 31
- Two rounds of consecutive standard monitoring with results below the Action Levels qualifies your System for reduced monitoring
 - But you must sample in accordance with Tiering Criteria

Reduced Monitoring – Annual or Triennial Monitoring Periods

- Sample between June 1 and September 30

Check your monitoring schedule on Drinking Water Watch





Tap Sampling Protocol

How to Collect Samples

- Sample must be collected after 6+ hours of stagnation
 - Most operators drop off a bottle at the residence with the instructions and collect the bottles the next day.
 - Usually easiest for resident to collect first thing in the morning before showering, flushing toilet, etc.
 - Can be done right after coming home from a day away from home

How to Collect Samples

- EPA strongly recommends using the Homeowner Instruction form
 - Operator can intercept improperly collected samples prior to paying for analysis
 - Protects operators
 - Easier to invalidate samples when these are sent with Chain of Custody to the lab
 - Signature not required but must have address
 - EPA can translate this form to another language where needed

but no later than 30 days after the system learns of the tap monitoring results. However, if excessive lead and/or copper levels are found, immediate notification will be provided (usually 1-2 working days after the system learns of the tap monitoring results).

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

Public Water Systems must retain these signed records for a minimum of 12 years. Please include one copy of this form with your Consumer Notice certification to the EPA.

TO BE COMPLETED BY RESIDENT

Water was last used: Time _____ Date _____

Sample was collected: Time _____ Date _____

Street Address: _____

Sample Location & faucet (e.g. Bathroom sink): _____

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

Printed Name _____

Signature _____ Date _____

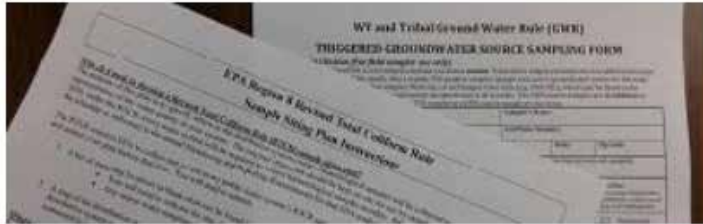
Where to Collect Samples

- Cold-Water Taps that are Regularly Used for Consumption
- Single Family Homes –
 - Kitchen or Bathroom Faucet
- Buildings –
 - Break Room
 - Cafeteria/Kitchen
- Cannot be collected from a tap with a filter or softeners (i.e. drinking fountains or kitchen taps with filters)



The Sample Collection Protocol is Online

Reporting and Forms



[Reporting, Forms and Instructions](#)

- [Reporting Forms](#)
- [Public Notification](#)
- [Consumer Confidence Reports](#)

Lead & Copper Rule (LCR)

| Form | Description |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | LCR Sample Collection Form and Instructions - This template may be used as a guide instructing consumers of water provided by a public water system on how to collect samples from their home taps for the purpose of lead and copper testing. This template is also available in MS Word format . |
| | LCR Consumer Notification Form – Notice of Lead Tap Water Results - This template may be used for public notification to consumers of water provided by a public water system, after lead and copper testing has been conducted on water collected in a consumer's home. This template is also available in MS Word format . |
| | LCR Consumer Notice Certification Form - This template may be used for certification to the EPA that public notification has been sent to consumers, after lead and copper testing has been conducted on water collected in a consumer's home. This template is also available in MS Word format . |

“Directions for Homeowner Tap Sample Collection Procedures”




Tap Sampling Site Plans (TSSSP)

LCR Tap Sample Site Plan (TSSSP)

- Materials Evaluations 141.86 Required in 1991
- EPA requires that systems certify that lead and copper sample sites comply with the LCR tiering criteria
- Region 8 prefers to use the Tap Sample Site Plan form

Lead & Copper Rule (LCR)

| Form | Description |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Lead and Copper Tap Sample Site Plan - This template may be used by public water systems in Wyoming and on EPA R8 Tribal Lands to identify, verify, and certify lead and copper tap sample sites to comply with the Lead and Copper Rule. This template is also available in MS Word format. These Lead and Copper Tap Sample Site Plan Instructions may be used as a guide for how to properly complete lead and copper tap sample site plans.</p> |

LEAD AND COPPER RULE

Lead and Copper Tap Sample Site Plan

Region 8 – Wyoming and R8 Tribal



THE NUMBER OF LEAD/COPPER SAMPLE SITES REQUIRED IS BASED ON THE POPULATION OF THE PWS AS SUMMARIZED BELOW:

| | |
|-----------------------|-------------------------------------------------------------------------|
| PWS ID: _____ | SYSTEM TYPE: <input type="checkbox"/> CWS <input type="checkbox"/> NTNC |
| SYSTEM NAME: _____ | POPULATION: <input type="checkbox"/> >100,000 |
| ADDRESS: _____ | <input type="checkbox"/> 10,001 to 100,000 |
| CONTACT PERSON: _____ | <input type="checkbox"/> 3,301 to 10,000 |
| PHONE NUMBER: _____ | <input type="checkbox"/> 501 to 3,300 |
| EMAIL ADDRESS: _____ | <input type="checkbox"/> 101 to 500 |
| | <input type="checkbox"/> ≤ 100 |

Minimum Number of Tap Sample Sites Required for the Lead and Copper Rule

| System Population | Minimum Number of Tap Sample Sites | |
|-------------------|------------------------------------|--------------------|
| | Standard Monitoring | Reduced Monitoring |
| 10,001 to 100,000 | 60 | 30 |
| 3,301 to 10,000 | 40 | 20 |
| 501 to 3,300 | 20 | 10 |
| 101 to 500 | 10 | 5 |
| Less than 101 | 5 | 5 |

LEAD AND COPPER SAMPLE SITE SELECTION FORM

PWS NUMBER: _____

Make sure you include all regular and backup sites and add as many pages as you need.

| No | Site Name & Address | Tier 1, 2, 3, Other | (R)egular sample site or (B)ack-up site | Plumbing Material | Date of Construction/Notes |
|----|---------------------|---------------------|-----------------------------------------|-------------------|----------------------------|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |

LCR Tap Sample Site Plan (TSSP) - CWS

Water systems must identify the highest priority (Tier) sites to sample.

Community public water systems (CWS) must sample at all Tier 1 sites if they have enough Tier 1 sites to choose from

- **Tier #1 sites** – Single Family Structures⁽¹⁾ that:
 - Contains or is serviced by copper pipes with lead solder installed between 1983 and 1988 or
 - Contains or is serviced by lead pipes (including goosenecks or pigtails) and/or served by a lead service line (LSL)⁽²⁾.

(1) If multiple family residences comprise at least 20% of the structures served by a system they can be counted as Tier 1.

(2) If the PWS has LSLs, then it must collect 50% of the samples from the LSL. If there are not enough LSLs for 50%, the PWS must sample at all sites with LSLs.

What if the CWS does not have Tier 1 Sites?

If the CWS does not have enough Tier 1 sites to choose from, then it must collect LC samples from Tier 2 sites.

- **Tier #2 sites:** Buildings (i.e. apartment buildings, schools, hospitals) that:
 - Contains or is serviced by copper pipes with lead solder installed between 1983 and 1988 or
 - Contains or is serviced by lead pipes (including goosenecks or pigtails) and/or served by a lead service line (LSL).

What if the CWS does not have Tier 1 + Tier 2 Sites?

If the CWS does not have enough Tier 1 + Tier 2 sites to choose from, then it must collect LC samples from Tier 3 sites.

- **Tier #3 sites:** Single Family Structures that:
 - Contains copper pipes having lead solder installed *before* 1983.
- Only when all Tier 1, Tier 2, and Tier 3 sites have been exhausted can Tier "Other" sites be counted for compliance.
- If a system has Tier 1, 2, or 3 sites but cannot collect samples from the highest Tier locations, they must notify EPA as to why they could not sample there.
- Failure to follow the Tiering Criteria will result in EPA invalidating the samples and potentially issuing a failure to monitor violation!

LCR Tap Sample Site Plan (TSSP) - NTNC

Water systems must identify the highest priority (Tier) sites to sample.

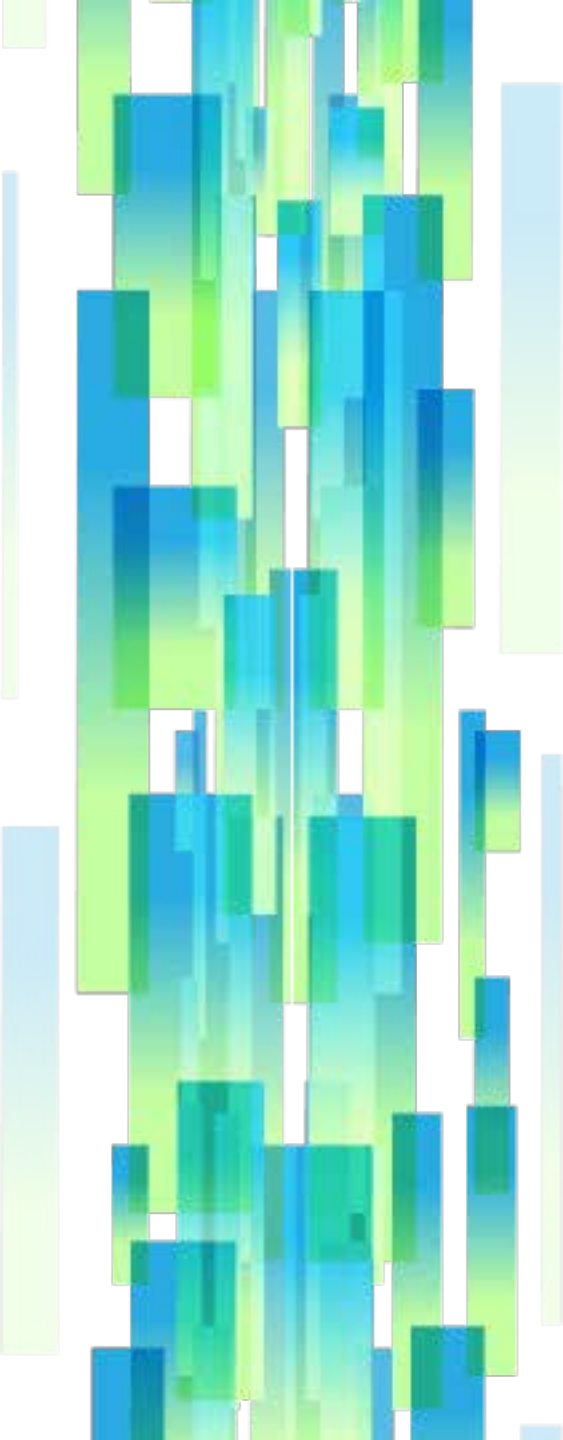
Non-Transient Non-Community (NTNC) public water systems must sample at all Tier 1 sites if they have enough Tier 1 sites to choose from

- **Tier #1 sites:** Buildings (i.e., apartment buildings, schools, hospitals) that:
 - Contains or is serviced by copper pipes with lead solder installed between 1983 and 1988 or
 - Contains or is serviced by lead pipes (including goosenecks or pigtails) and/or served by a lead service line (LSL).

What if the **NTNC** does not have Tier 1 Sites?

If the NTNC WS does not have enough Tier 1 sites to choose from, then it must collect LC samples from Tier 2 sites.

- Tier #2 sites: Buildings that:
 - Contains copper pipes having lead solder installed *before* 1983.
- Only when all Tier 1 and Tier 2 sites have been exhausted can Tier “Other” sites be counted for compliance.
- If a system has Tier 1 or 2 sites but cannot collect samples from the highest Tier locations, they must notify EPA as to why they could not sample there.
- Failure to follow the Tiering Criteria will result in EPA invalidating the samples and potentially issuing a failure to monitor violation!



If you are a CWS

Tier 1 sampling sites are single family structures:

- With copper pipes with lead solder installed between 1983 and 1988*; or
- contain lead pipes; or
- are served by a lead service line.

Tier 2 sampling sites consist of buildings (i.e. apartment buildings, schools, hospitals):

- with copper pipes with lead solder installed between 1983 and 1988, or
- contain lead pipes; and/or
- served by a lead service line.

Tier 3 sampling sites are single family structures with copper pipes having lead solder installed before 1983.

Tier **"Other"**:

- All other structures.

If you are a NTNCWS

Tier 1 sampling sites consist of buildings:

- with copper pipes with lead solder installed between 1983 and 1988*; or
- contain lead pipes; or
- are served by a lead service line.

Tier 2 sampling sites consist of buildings with copper pipes with lead solder installed before 1983.

Tier **"Other"**:

- All other structures.

**Email me or check online
for a Cheat Sheet.**

Can I Change Sample Sites?

Great question! Yes

- Submit Revised TSSP to EPA R8
- Include the reasons old sites were removed from the sampling plan
- What are some examples of why you would change your sampling locations?
 - Homeowner abandons their home
 - Home is demolished
 - You find a lead service line that you were unaware of



Sample Invalidation

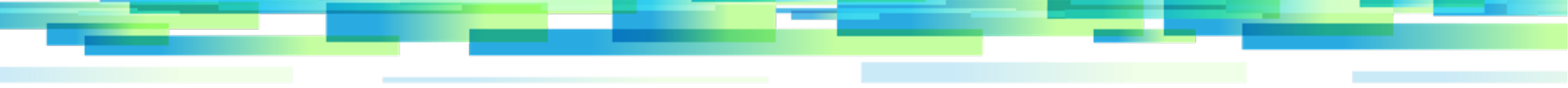
LCR Sample Invalidation

CFR 141.86(f): A sample invalidated under this paragraph does not count toward determining lead or copper 90th percentile levels under §141.80(c)(3) or toward meeting the minimum monitoring requirements of paragraph (c) of this section.

1. The laboratory establishes that improper sample analysis caused erroneous results.
2. The State determines that the sample was taken from a site that did not meet the site selection criteria of this section.
3. The sample container was damaged in transit.
4. There is substantial reason to believe that the sample was subject to tampering.


LCR Sample Invalidation

- Once a sample is invalidated the system has 20 days to remediate the situation (no extensions)
- Common sample invalidation reasons and remediation steps:
 - Sample is not on sampling plan and EPA has no information on the sample
 - **Provide EPA with information** on the location – tier, year of build, service line materials
 - Sample was collected from an improper tap (hose bib)
 - **Re-collect sample** from an appropriate tap
 - Sample was collected from a lower tier location
 - **Re-collect sample** from the correct tier



Lead Consumer Notices

Lead Consumer Notices

- Each individual result must be delivered to each residence where a sample was collected within 30 days of receiving the result from the lab.
 - Recommend using the form on our Region 8 website.
 - Fill out the top portion for each individual sampling location and send out the entire form with all required language
 - Community water systems must hand deliver or mail the result to the residents
 - NTNC systems may post or email the results but need to explain to EPA that it reached all regular consumers of the water. Note that it still must list each location and result, a 90th percentile is not sufficient
- 

Consumer Notice of Lead Tap Water Results

Public Water System Name: _____ Public Water System ID: _____

Include PWS name and number so EPA can record it properly

Sample Location: _____ Date Collected: _____

Must include date the sample was collected

Dear _____,

We would like to thank you for your participation in the lead tap monitoring program. Below is the lead result for the sample location listed above. Additional general information concerning lead in drinking water follows. For more information on reducing lead exposure around your home and the health effects of lead, visit EPA's Web site at www.epa.gov/lead, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Must include the address of the tap that was tested

If you need more information concerning this result, please call the _____ community water supply at _____ and ask for _____.

Must include contact information for the water utility

ONLY the statement that is checked below applies to your sample location.

____ Lead was NOT DETECTED at this sample location.

____ Lead was detected at _____ mg/L (ppm). This result is BELOW the lead action level of 0.015 mg/L (ppm).

Needs to have this section filled out:

- Checks the statement that applies to the individual result
- Must provide the individual tap results
- Make sure the statement that is provided makes sense and that units aren't being mixed. These forms are provided in both ug/L and mg/L on our website

____ Lead was detected at _____ mg/L (ppm). This result is ABOVE the lead action level of 0.015 mg/L (ppm).

Lead Consumer Notice Certification

This form is intended for use by public water systems in Wyoming and tribal lands in the following states: Colorado, Montana, North Dakota, South Dakota, Utah or Wyoming.

Please complete this Lead Consumer Notice Certification Form. Include one completed Consumer Notice of Lead Tap Water Results Form and send both documents to: EPA Region 8, Lead/Copper Rule Manager, rsdwu@epa.gov, or mail to 1595 Wynkoop Street, Denver, CO 80202-1129 or fax to: Attention Lead/Copper Rule Manager, 1-877-876-9101.

PWS Name: _____ PWS No. _____

Contact Person: _____ Phone : (____) _____

Today's Date: _____

Monitoring period to which the notice applies (e.g., June – September 2019): _____

The last result for the period was received from the laboratory on: _____

All results were provided to consumers by (date): _____

The water system also certifies that the notice contained the following information and was delivered within 30 days of receiving the test results from the laboratory:

Individual tap results from lead tap water monitoring

An explanation of the health effects of lead

Steps that consumers can take to reduce exposure to lead in drinking water

Contact information for your water utility

The maximum contaminant level goals and action levels for lead, and the definitions of these two terms

DELIVERY METHOD

The result/information notice was distributed by the following method, check all that apply:

By Direct Mail _____

By Hand Delivery _____

By Electronic mail _____

Other (e.g. posting) _____



Lead Consumer Notices

Send 1 copy of a consumer notice as it was distributed to the resident

AND

1 certification form

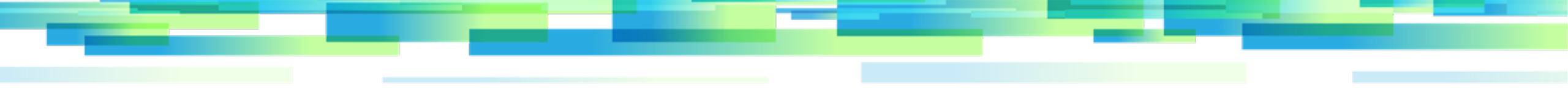
PER MONITORING PERIOD

To: R8DWU@epa.gov

Within 90 days of the end of the monitoring period.


If you find yourself in violation, you will return to compliance once these steps have been taken for each monitoring period





Action Level Exceedances

Action Level Exceedances (ALE)

- An Action Level Exceedance (ALE) is when the 90th percentile of the compliance samples collected is greater than:
 - 15 ppb (ug/L) or 0.015 ppm (mg/L) for lead
 - 1.3 mg/L for copper
 - If you have an ALE, you should contact EPA right away to find out the next steps
 - Distribute the Lead Consumer Notices as soon as possible
 - An ALE is not a violation but failing to perform follow-up actions is a violation.
 - There are many actions to complete with various deadlines so it's important to follow the instructions in the ALE letter.
- 

Action Level Exceedances – Public Education (PE)

- Task 1: Public Education (PE) – ONLY REQUIRED FOR LEAD ALEs
 - Must be completed **within 60 days after the end of the monitoring period**
 - Templates and instructions are on our website and attached to ALE letter
 - PE materials **must be pre-approved by EPA prior to distribution**
 - Requirements are non-trivial and vary with system size and type (community vs. NTNC)
 - NTNC must post PE in public places or common areas of the building
 - NTNC must distribute informational pamphlets and/or brochures on lead in drinking water to each person served by the system.

Action Level Exceedances – Public Education

- Task 1: Public Education – ONLY REQUIRED FOR LEAD ALEs
 - **Community Water Systems** (see template for exact instructions):
 - Notify every person served by the water system
 - Notify local public health agencies even if they are not located within the water system's service area (by phone or in person)
 - Notify all other organizations within the service area (schools, WIC and head start, hospitals, pediatricians, family planning, welfare agencies, childcare centers, preschools, OB/GYNs and midwives)
 - Press release to newspaper, television and radio systems for systems larger than 3,300
 - Perform 1-3+ of the following activities - PSAs, paid advertisements, information displays, emails to customers, public meetings, household deliveries, targeted individual customer contact, etc.
 - Must put specific language in every water bill (no less than quarterly) until AL is no longer exceeded

Action Level Exceedances – Public Education

- Task 1: Public Education – ONLY REQUIRED FOR LEAD ALEs
 - First, customize the Public Education template to fit your system/circumstance
 - Second, submit proposed PE to EPA for approval
 - Then distribute PE in accordance with the instructions
 - Finally, submit the PE certification forms to EPA (R8DWU@epa.gov) as soon as possible but no later than 60 days after the end of the monitoring period
 - For **community water systems**, submit quarterly certification to EPA

Action Level Exceedances – Water Quality Parameters

- Task 2: Water Quality Parameter (WQP) samples
 - Due 6 months after the beginning of the monitoring period – tight timeline for 6 month monitoring periods
 - WQP samples should be fully flushed
 - Must be collected **twice** but shouldn't be collected on the same day – ideally want to capture seasonality
 - Best to collect pH and temperature data in the field as soon as possible after exceedance

Action Level Exceedances - WQPs

- Task 2: WQP samples
 - Tap WQP samples:
 - Number of taps depends on population:
 - 1 tap for population ≤ 500
 - 2 for pop 501-3300
 - 3 for pop 3,301 – 10,000
 - Entry Point to the Distribution Point Samples
 - Should be representative of each source after treatment
 - Analyses
 - pH - Conductivity
 - Temperature - Calcium
 - Alkalinity
 - Orthophosphate where an inhibitor containing a phosphate compound is used
 - Silica, when an inhibitor containing a silicate compound is used


Action Level Exceedance – Source Water Lead & Copper

- Task 3: Source Water Lead and Copper Sampling
 - Collect one lead and one copper sample at the Entry Point to the Distribution System
 - Due 6 months after the end of the monitoring period
 - Can be granted reduced monitoring for subsequent ALEs
- Task 4: Submit Source Water Treatment Recommendation form
 - There is not typically lead or copper in source water so therefore this recommendation form is pre-filled for no treatment. It just needs to be filled out and signed and submitted to EPA.
 - Due 6 months after the end of the monitoring period

Action Level Exceedance – Corrosion Control Treatment

- Task 5: Submit Corrosion Control Treatment Recommendation Form
 - Due 6 months after the end of the monitoring period
 - System may only select 1 of 4 options
 - Alkalinity and pH adjustment
 - Calcium hardness adjustment
 - Phosphate based corrosion inhibitor
 - Silica based corrosion inhibitor
 - This selection is not permanent and may be changed if ALEs persist and additional data is collected that changes the recommendation
- Task 6: Routine 6 month tap sample collection

Action Level Exceedances – Further Steps

- If ALEs persist, the system will be required to follow additional steps including:
 - Corrosion Control Study, if required by EPA
 - EPA will designate an Optimal Corrosion Control Treatment
 - System will install CCT
 - System will conduct follow up sampling
 - EPA will review data and designate OCCT operating parameters
 - System will operate in accordance with the EPA OCCT designated parameters
- 

Questions?

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