Reducing Lead in Drinking Water

A Guidance for New Mexico's

Schools and Day Care Facilities

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New Mexico Environment Department
Drinking Water Bureau

New Mexico Department of Health
Environmental Health and Epidemiology Bureau

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Introduction

This guidance is intended to provide a clear path for New Mexico's schools, summer camps and other potential vulnerable customers to minimize the consumption of lead in drinking water by children and adults. Specifically with lead contamination, vulnerable customers are identified as children under age six and pregnant women. It is the intent of the New Mexico Environment Department (NMED) Drinking Water Bureau (DWB) and the New Mexico Department of Health (NMDOH) to have school administrators and day care facility owners review this guidance and implement the suggested activities to identify lead infrastructure problems and to reduce the levels of lead in the drinking water consumed. NMDOH will issue separate guidance for hospital administrators to identify infrastructure problems and to reduce lead in drinking water for vulnerable hospital patients.

NMDOH oversees the NM Childhood Lead Poisoning Prevention Program, which provides assistance to children with elevated blood levels as well as public education on the prevention of exposure to lead https://nmhealth.org/go/lead/. This website also contains educational materials for homeowners who have identified lead in tap water and want to reduce lead levels in water that is consumed at home.

NMED DWB is charged with the implementation of the United States Environmental Protection Agency (EPA) federal and state drinking water requirements for public water systems (PWS) throughout New Mexico https://www.env.nm.gov/dwb/contaminants/lead_and_copper.htm. A public water system provides water for human consumption through pipes or other constructed conveyances to at least 15 service connections or serves an average of at least 25 people for at least 60 days a year. A public water system may be publicly or privately owned. All PWSs are required by law to provide water that meets federal and state requirements; however, schools typically do not meet EPA site-selection criteria for lead monitoring because it prioritizes single and multi-family dwellings for sample collection locations. For this reason, little data exist on lead levels in drinking water at schools in New Mexico and other locations where customers may be more vulnerable to potential health impacts. Due to the potential adverse health effects of lead in drinking water, NMED DWB has developed this guidance with NMDOH to assist in the prevention and treatment of lead in drinking water at schools and facilities with vulnerable customers, which may not fall under the monitoring framework set up within the Safe Drinking Water Act (SDWA), Lead and Copper Rule (LCR) for PWS.

School administrators and owners of facilities that serve water regularly to customers that are vulnerable to lead contamination should review this guidance and implement the activities that reduce lead levels at all taps that are used for drinking water and in food preparation. The specific instructions provided regarding testing and corrective actions are designed to assist the health, safety, maintenance personnel, and any consultants working with educational agencies to reduce the lead levels in drinking water.

Lead Contaminant Exposure and Health Impacts

Lead is a toxic metal known to be harmful to human health if ingested or inhaled. Blood lead levels as low as 5 micrograms per deciliter (µg/dL) are associated with adverse mental, physical and behavioral effects on children. However, no measurable blood lead level is considered safe.

Health Risks

Children:

Children are especially susceptible to lead exposure because their bodies absorb metals at higher rates than the average adult. Children younger than six years old are most at risk due to their rapid rate of growth. Exposure to high levels of lead can cause damage to the brain, nervous system, red blood cells, and kidneys. Exposure to low levels of lead has the potential to cause lower intelligence quotients (IQs), hearing impairment, reduced attention span, hyperactivity, developmental delays, and poor classroom performance.

Adults:

High blood-lead levels in adults have been linked to increased blood pressure, poor muscle coordination, nerve damage, and hearing and vision impairment. Pregnant women and their fetuses are especially vulnerable to lead exposure since lead can significantly harm the fetus, causing lower birth weight and slowing normal mental and physical development.

Common Lead Exposures

Lead in the environment:

- Lead-based paint and some glazes
- Lead-contaminated dust and soil
- Improper disposal of commercial products such as automotive batteries, computers, and other electronic and visual communication devices
- Industrial sources such as mining, smelting, and refining

Lead in drinking water:

- Lead enters tap water through corrosion of plumbing materials

Lead in Schools, Summer Camps, and Day Care Centers

Children under age 6 years and pregnant women have been identified as more vulnerable to the health impacts of lead contamination in drinking water. Therefore, facilities that serve vulnerable customers on a daily basis should test the water from taps commonly used for drinking in order to identify any lead contamination in drinking water served. Drinking water certified laboratories

should be used and can be called for sample bottles and collection instructions. For a list of laboratories currently certified for drinking water analyses in New Mexico, go to https://www.env.nm.gov/dwb/lccnm.htm.

Children are more vulnerable to lead

Children typically have higher intake rates for environmental materials (such as soil, dust, food, water, air, paint) than adults. They are more likely to play in the dirt and put their hands and other objects in their mouths. In addition, children tend to absorb a higher fraction of ingested lead than adults, which can slow normal physical and mental development of growing bodies.

Plumbing materials and water use patterns at schools

Lead levels in the water within the plumbing system of schools can vary with plumbing system features (lead solder, brass fixtures, age of materials, water chemistry), pipe configuration (looped or dead-ends) and usage patterns (high usage to stagnant). The amount of time the water is in contact with the various components of the plumbing system may have a large effect on the concentrations of lead found. The "on-again, off-again" water use patterns of most schools can result in elevated lead levels in drinking water. Water that remains stagnant in plumbing overnight, over a weekend, or during a vacation is in longer contact with plumbing materials and therefore may contain higher levels of lead.

How Does Lead Get Into Drinking Water?

Lead in drinking water is primarily from materials and components associated with the water distribution system and plumbing. Lead is typically an "endpoint" problem, with the highest concentrations of lead near the tap. Lead may be present in various parts of the plumbing system such as lead solder, brass fixtures, and lead pipes. Lead is then leached into the water passing through the plumbing system. The most common source of lead leaching is corrosion, a reaction between the water and lead pipes or solder. Dissolved oxygen, low pH, low mineral content and other water quality characteristics can affect the extent of corrosion. For this reason, the lead concentration has the potential to be at its highest when water has remained unused overnight or longer.

EPA Action Level (AL) for Lead in Drinking Water Can be expressed in the following equivalent units:				**Blood Lead Levels** Expressed as:
Lead AL =	0.015 mg/L	(milligrams per liter)		5 µg/dL (micrograms per deciliter)
Lead AL =	15 mcg/L	(micrograms per liter)		
Lead AL =	15 µg/L	(micrograms per liter)		
Lead AL =	15 ppb	(parts per billion)		

Low or No Cost Methods for Short-Term Reduction of Lead levels

These solutions are short-term for lead in drinking water; long-term solutions need to be developed and implemented. Short-term solutions can be used to begin reducing elevated lead levels. Sampling and planning should occur simultaneously to develop the permanent long-term solutions.

Flush taps before use

The longer water has been standing in the plumbing system, the more lead it may contain. Running water at a tap, usually for two to three minutes, prior to using it for drinking, cooking, baby formula preparation or other consumptive uses will often reduce lead levels in the water. Flushing works by removing the water with the most lead from the drinking water system. Taps should be flushed at least twice a day – in the morning and at midday, or before each use.

Use only cold water for drinking and food preparation

Hot water is more likely to contain higher levels of lead than cold water. Only water from the cold-water tap should be used for drinking, preparing juice, mixing baby formula or food preparation. Boiling the water will not remove lead and may actually increase the concentration of lead.

Routine maintenance

Clean faucet aerators on a quarterly basis – more if debris buildup is observed.

Test the water for lead

The only way to determine how much lead is present in the drinking water is to have the water tested. Each tap or fixture providing water for drinking or food preparation should be tested at least every three years. NMED DWB recommends that schools or facilities with vulnerable customers include annual lead in water testing in the yearly maintenance budget so that all drinking water taps are sampled at least every three years. Corrective action should then be taken at taps with elevated lead levels. More detailed instructions on testing water for lead and information about corrective actions can be found on pages 9-12.

Use bottled or filtered water

For children under age 6 years and pregnant women, use bottled water or water from a filtration system that has been certified by an independent testing organization to reduce or eliminate lead for cooking, drinking, baby formula preparation.

Testing of Children for Lead Exposure

If a parent reports to a school that their child has a blood-lead level of 5 µg/dL or higher, the school should refer the parent to the CLPPP email at DOH-CLPPP@state.nm.us. In general, for children under the age of 6 who have never been tested for a blood lead level, the child should be tested for lead. The parents or guardians can request this test through the primary care provider.

Regulatory Background on Lead in Drinking Water

For the purpose of this guidance, schools and facilities with vulnerable customers are classified in three categories listed below. Facilities in all three categories should test for lead at drinking water taps.

A. Schools or facilities with vulnerable customers that receive their water from a regulated community public water system (PWS).

B. Schools or facilities with vulnerable customers that own and manage their own source of drinking water such as a well and serve 25 or more children and employees at least 6 months per year are considered a non-transient non-community PWS and are regulated under the Safe Drinking Water Act.

C. Schools that own and manage their own source of drinking water such as a well and serve less than 25 children and employees are not considered public water systems and are not regulated under the federal Safe Drinking Water Act or by the State.

The table below displays the rules, regulations and guidance applicable to each school category. Each rule, regulation or guidance will be explained in detail in the following sections.

Regulations and Guidance Governing Lead in Schools Drinking Water					
Category	**Description**	**LCR[1]**	**LCCA[2]**	**3T's[3]**	**Reduction of Lead in Drinking Water Act**
A	Water Supplied by a Community PWS	YES	YES	YES	YES
B	Water Supplied by private source & have ≥25 employees & children	YES	YES	YES	YES
C	Water Supplied by private source & have <25 employees & children	NO	YES	YES	YES

[1]**LCR** - Lead and Copper Rule; Safe Drinking Water Act
[2]**LCCA** - Lead Contamination Control Act
[3]**3T's** - Training, Testing and Telling

The Safe Drinking Water Act (SDWA), Lead and Copper Rule (LCR)

Due to the nature of site selection for monitoring per the LCR, which prioritizes family homes and the small number of samples required, schools do not meet the EPA site selection criteria for lead monitoring under the LCR. However, the building infrastructure at schools, summer camps and day care facilities may still have lead service lines impacting water quality. Therefore, schools and other institutions that serve vulnerable populations should consider implementing a lead monitoring schedule based on this guidance, even if the water is served by a regulated public water system. Please see page 10 for details on developing a monitoring and reduction plan. The SDWA LCR applies to each category of school or day care facility differently:

Category A Facilities:
If a school is served by a PWS, then that PWS is required to monitor select sites throughout the area of coverage on a pre-set schedule. Under the LCR, no more than ten percent (10%) of the samples monitored from a PWS's drinking water taps may exceed the lead action level of 0.015 mg/L or copper AL of 1.3 mg/L. If either action level is exceeded, the PWS is legally required to take corrective action.

Category B Facilities:
If a school is served by their own water source and serve 25 or more of the same people for a minimum of 6 months, they qualify as a non-transient non-community PWS. A minimum number of sites are required by the SDWA to be monitored on a pre-set schedule established by the DWB. No more than ten percent (10%) of the samples monitored from a school system's drinking water

taps may exceed the lead or copper AL. If the action level is exceeded, the school is legally required to take corrective action.

Category C Schools:
If a school is served by their own water source and serve less than 25 people, the requirements of the LCR of the SDWA do not apply. However, it is recommended that the guidance for category A and B facilities is followed.

More information on the LCR can be found at:
https://www.epa.gov/dwreginfo/lead-and-copper-rule

The Lead Contamination Control Act (LCCA)

This law applies to all three categories of schools. The intent of the LCCA is to identify and reduce lead in drinking water at schools and relies on voluntary compliance by individual schools and school districts. More information on the LCCA can be found at:
http://water.epa.gov/infrastructure/drinkingwater/schools/regulations.cfm

3T's – Training, Testing, & Telling

EPA developed the 3T's (Training, Testing, and Telling) to assist all categories of schools in reducing the lead concentrations in their drinking water. The DWB recommends that all schools adopt and implement a lead reduction program focusing on the following six areas:

- Determine current understanding of water quality and obtain financial assistance
- Identification of potential problem areas
- Develop a monitoring plan
- Collection and submittal of water samples for testing
- Implementation of corrective action plans if lead concentrations exceed 0.015 mg/L
- Communication and public outreach

A copy of the guidance can be found at:
http://www.epa.gov/ogwdw/schools/pdfs/lead/toolkit_leadschools_guide_3ts_leadschools.pdf

The Reduction of Lead in Drinking Water Act

This law applies to all categories of schools. Lead found in drinking water is typically not from natural water and soil sources. The most common cause of lead concentration in water is due to the corrosion of pipes and plumbing fixtures. In an effort to reduce this contamination, EPA in 1986 amended the SDWA to mandate that all pipes, solders, fittings, and fixtures be lead free. Lead free was defined as solder and flux containing not more than 0.20% lead, and pipes and pipefittings containing not more than 8.0% lead. All plumbing fittings and fixtures must meet the NSF/ANSI Standard 61.

In 2011, the enactment of the Reduction of Lead in Drinking Water Act was signed into law. The act reduces the allowable lead content in plumbing materials by modifying the SDWA definition of lead free. As of January 4, 2014, lead free is now defined as weighted average of not more than 0.25% in wetted surface material for pipe, pipe and plumbing fittings and fixtures. It retains the 0.20% lead limit for solders and flux as implemented in the 1986 amendments.

More information on the Reduction of Lead in Drinking Water Act can be found at: http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100GRDZ.txt

How to Develop a Lead Monitoring and Reduction Plan

These guidelines apply to schools in categories A, B, and C.

Step 1- Assessment and Sampling Plan Development:

When developing a program to test for lead in drinking water it is important to consider the following steps:

1. Take an inventory of all drinking water taps used for consumption (i.e. drinking water and food preparation)

   Taps used for human consumption should only be cold water taps; hot water taps should never be used to obtain water for drinking water or food preparation. Check all drinking fountains to ensure EPA has not identified them as having a lead lined tank under the LCCA. This list can be found at: http://tinyurl.com/kr8kppf.

   If a drinking fountain within the school is found on this list, it should be removed from use immediately.

2. Prioritize drinking water tap sampling:
   High: taps used by children under the age of six years of age or pregnant women (i.e. drinking fountains, nurse's office sinks, classrooms used for early childhood education and kitchen sinks), taps served by known Lead Service Lines (LSL).

   Medium: other taps regularly used to obtain water for drinking or cooking (i.e. home economic sinks, classroom sinks, and teacher's lounges).

   Low: all other taps that could be used to obtain water for drinking but are not typically used for that purpose (i.e. bathroom faucets and utility sinks).

3. Determine a schedule for sampling:

All taps should be tested at a minimum of once every three (3) years, and annual testing is recommended. If the budget does not allow all taps to be tested in the first year it is suggested that all high priority taps be tested the first year, the medium priority the second and the low priority the third.

4. Testing
   Determine which certified laboratory will analyze the drinking water samples and call to receive sample bottles and instructions for sample collection and submission. Certified laboratories can be found at: https://www.env.nm.gov/dwb/lccnm.htm

   Suggested directions developed by NMED DWB for homeowner (and others) tap sample collection procedures can be found at: https://www.env.nm.gov/dwb/contaminants/documents/LCR_HomeownerTapSampleCollectionProcedures_NM_3.28.16.pdf

Step 2- Conduct First Draw Tap Monitoring:

Water from all taps used for drinking or food preparation should be tested for lead using first draw samples. First draw means that the samples are to be collected before the fixture is used or flushed during the day. Use only cold water for collecting lead samples.

Sample Site Preparation and Sample Collection:

- Taps should not be used for between 6 and 18 hours prior to sampling.
- Collect a one liter (1L) first draw sample, which is the water to first come out when the tap is turned on (i.e., DO NOT FLUSH the tap before collecting sample).
- Mail/deliver the sample to the drinking water certified laboratory that sent the bottles. The laboratory will send the results back once the sample is analyzed.

Step 3- Interpret Sample Results:

- Verify that the results are expressed in mg/L.
- If lead is at or below 0.015 mg/L, the tap may be used for drinking water or food preparation and should be retested at least every three years. Proceed to Step 6 unless corrective action is preferred to remove or reduce any lead levels identified, then proceed to the next step.
- If lead exceeds 0.015 mg/L, initiate twice daily flushing. Flush the tap in the morning before school begins and at midday. Users can also decide to flush for 2-3 minutes before each use. Evaluate and implement a corrective action plan. Proceed to Step 4.

Step 4- Corrective Actions:

In addition to twice daily flushing in Step 3, a corrective action needs to be implemented when results exceed 0.015 mg/L. Although flushing often works to reduce lead in drinking water, it requires staff time, diligence, and commitment to ensure effectiveness and is not the most cost effective long-term corrective action.

Again, bottled water should be provided for children under age 6 years and pregnant women until corrective actions are successful in reducing lead levels below 0.015 mg/L. Each corrective action is described in detail, below.

1. The Elimination of Lead Sources

Engineering plans and specifications for the plumbing system are useful for identifying sources of lead and helpful in determining if sources of lead can be removed from service or replaced with lead free fixtures. The elimination of sources of lead in drinking water infrastructure is an important long-term solution for facilities with vulnerable customers to consider.

- Remove tap/fixture from service. If the tap is seldom used, it may be disconnected or removed from the water supply line, but first verify the tap is not required for code compliance.
- Replace with lead free fixture/plumbing component.
- If the existing tap is suspected to be the source of contamination, replace with a lead-free tap.
- Replace other sources of lead, including lead pipe, lead solder joints, and brass plumbing components with lead free materials.

Recommended sampling protocol for facilities undergoing LSL replacement:

When lead service lines (LSL) have been identified to be replaced, collect four 1-liter first-draw samples with a minimum 6-hr stagnation period between samples before replacement to confirm lead levels and verify that replacement is required.

Following the replacement of LSL, collect four 1-Liter first-draw samples with a minimum 6-hr stagnation period at the following intervals:

- 72-hr
- 1 month
- 3 months
- 6 months

To minimize the introduction of lead into drinking water systems, go to EPA website: http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100GRDZ.txt to identify lead free certification marks for drinking water systems and plumbing materials.

2. Implement a Flushing Program

Flushing the drinking water taps (letting them run for a set amount of time) often works to reduce lead concentrations in drinking water. A flushing program works to reduce lead concentrations by clearing the taps of water that have been in contact with plumbing components that may be high in lead. There are two primary types of flushing programs: Individual Tap Flushing and Main Pipe Flushing.

An **Individual Tap Flushing Program** may be implemented if lead concentrations are found to be high at certain taps.

- Flush individual taps that have been tested and found to have high lead levels. This procedure is to be followed each day the school is in session.

During periods of normal use:

- Run each tap in the morning for 2 to 3 minutes before children arrive.
- Run each tap at midday for 2 to 3 minutes.

After long weekends or breaks:

- Run each tap for 10 to 15 minutes before children return to school.

A **Main Pipe Flushing Program** may be implemented if lead concentrations are found to be high throughout the entire system or confined to a certain area of the school. This procedure is to be followed each day the school is in session. Main pipe flushing also has the added benefits of keeping chlorine residuals at appropriate levels (if system disinfects with chlorine) and can eliminate biofilm and settled material that contribute to taste and odor issues.

- Begin by flushing the tap furthest away from the water source for at least ten minutes.
- Next flush the tap the second furthest away and continue in this manner until all taps have been flushed.
- First draw and flushed samples should be collected and analyzed for lead every six months.

Review the results upon receipt.

- If the flushed sample results are not below the lead action level, other corrective action options should be explored.

- If the flushed sample results are below the lead action level, the flushing program can continue.
- If first draw samples drop below the lead action level for two consecutive six month rounds of testing, the flushing program can be discontinued. Monitoring should continue to one more six-month round to ensure the lead levels do not increase again.

3. Water Treatment:

Professional design, installation and maintenance is recommended for any drinking water treatment device or chemical treatment that impacts drinking water quality. Routine monitoring should continue after the installation of water treatment in order to ensure proper function over time.

Point-of-Use (POU) Treatment Device - A POU water treatment device may be installed at taps where water shows lead levels of concern. It is strongly encouraged that the POU device is approved to meet National Sanitation Foundation (NSF) Standard 53, NSF Standard 58, NSF Standard 61 or an equivalent standard. It is to be installed, operated, and maintained in accordance with the manufacturer's recommendations.

Point of Entry (POE) Chemical Treatment - Adjusting the water chemistry may reduce the amount of lead absorbed by the water. This may be done by adding a chemical to the water as it enters the building. Typical methods of chemical treatment include addition of a phosphate based or silica-based corrosion inhibitor or an adjustment to the water's pH or hardness. All chemical additives used for potable water must conform to NSF Standard 60.

All public water systems (facilities that serve water to more than 25 people for at least 60 days of the year) that install chemical treatment systems are subject to NMED DWB plan review and approval prior to installation. It must be noted the installation of POE or POU treatment will subject a public water system to other requirements of the SDWA including additional water quality monitoring.

Step 5- Reassessment:

All taps affected by a corrective action (Step 4) are retested after the corrective action has been implemented. A first draw sample is to be taken, using the procedure outlined in Step 2.
Interpreting Post Corrective Action Results

- If the analysis shows lead at or below 0.015 mg/L, no further action is required, as long as the corrective action remains in place. The next sample should be collected annually at high priority taps or at least within three years.
- If the analysis shows lead remains above 0.015 mg/L, continue twice daily flushing. A midday sample as specified in Step 3 is to be collected to determine if flushing is

effective or a new corrective action can be implemented followed by retesting as specified in Step 2.

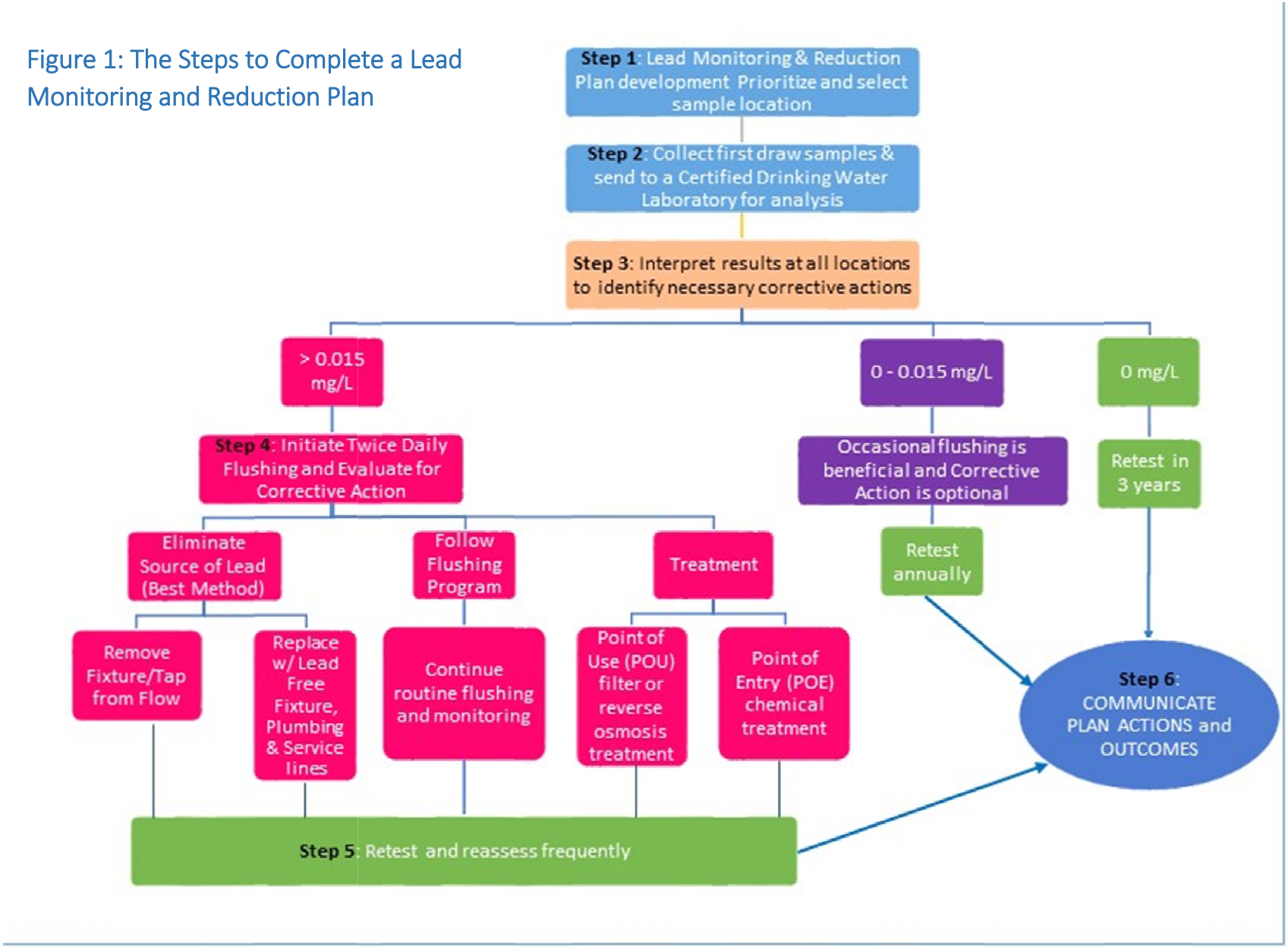
Step 6- Communicate Results:

In addition to testing for lead, a lead control program should include a communication plan. The purpose of a communication plan is to provide a process for school employees, students, parents or other customers to address questions, report results and provide ongoing, up-to-date information regarding sampling efforts.
At schools EPA recommends that school management:

- Assign a designated person to be the contact.
- Notify affected individuals about the purpose of the testing as well as the results. School employees, students and parents should be informed and involved in the overall process. Examples are: meetings, open houses, public notices.
- Identify and share specific activities they are pursuing to correct any lead problems. Local health officials can assist in understanding potential health risks, technical assistance and communication strategies.

More information and sample public notice materials can be found at:
http://www.epa.gov/ogwdw/schools/pdfs/lead/toolkit_leadschools_guide_3ts_leadschools.pdf

Figure 1: The Steps to Complete a Lead Monitoring and Reduction Plan



Glossary

1. Action Level - Lead exposure level at which EPA requires corrective action under the Safe Drinking Water Act

2. Aerator - An aerator is found at the tip of the faucet. Aerators are screwed onto the faucet head, creating a non-splashing stream and delivering a mixture of water and air

3. Corrosion - A dissolving and wearing away of metal caused by a chemical reaction between water and plumbing materials in contact with the water

4. Faucet/Tap - Point of access for people to obtain water for drinking or food preparation. A faucet/tap can be a fixture, faucet, drinking fountain or water cooler. Drinking water taps typically do not include bathroom taps, hose bibs, or custodial closet sinks

5. First Draw Sample - The first water drawn from a faucet/tap after the water has sat undisturbed in the plumbing system for at least 6 hours

6. Fittings - Plumbing components used to join sections of pipe or to join pipe to fixtures

7. Fixture - Exchangeable device connected for the distribution and use of water in a building. Examples: fountain, sinks, shower, tub, toilet, hydrant

8. Flush(ing) - Running the water at a faucet/tap or combination of faucets/taps to clear standing water from the plumbing system

9. Flux - A substance applied during soldering to facilitate the flow of solder. Flux used prior to 1986 contains lead and can itself be a source of lead contamination in water Lead Free - Weighted average of not more than 0.25% in wetted surface material for pipe, pipe and plumbing fittings and fixtures Limit of Detection (LOD) – The lowest quantity of a substance that can be distinguished from the absence of the substance due to the instruments analytical process pH - A measure of acidity and alkalinity

10. Parts per Billion (ppb) - A standard unit of measurement commonly used to describe the concentration of lead in drinking water. Also expressed as microgram/liter (µg/L)

11. Point of Entry (POE) - A water treatment device installed to treat all water entering a single school, building, facility or home. Example: water softener

12. Point of Use (POU) - A water treatment device intended to treat water for direct consumption, typically at a single tap or a limited number of taps. Example: faucet mount cartridge filter

13. Public Water System (PWS) - A system that serves water to the public. System has at least 15 service connections or regularly serves an average of 25 individuals daily at least 60 days out of the year.

    a. Community Public Water System - A PWS which serves the same population year-round. Examples: municipalities, manufactured mobile home parks

    b. Non-transient non-community public water system - A PWS that is not a CPWS and that regularly serves at least 25 of the same persons over 6 months per year. Examples: schools, hospitals, factories, and office buildings

14. Service Connection/line - The pipe that carries tap water from the public water main to a building

15. Solder - A metallic compound used to seal the joints between pipes. Until 1988, solder containing up to 50% lead was legally used in potable water plumbing. Lead free solders, which can contain up to 0.2% lead, often contain one or more of the following metals: antimony, tin, copper or silver

Other References

Reducing Lead in Drinking Water

Minnesota Department of Health Environmental Health Division; Drinking Water Protection Section
Rev. 04/14 651-201-4700