Module 6: Remediation and Establishing Routine Practices

Solutions to lead problems typically should be addressed on both a short-term and a long-term basis. Measures can be taken while you wait for your test results or until a permanent solution has been put in place. It is helpful to become familiar with potential remediation options before sampling has occurred. You should work closely with maintenance staff and plumbers who may make repairs to ensure that the chosen remediation options will remove lead from the water and to understand the benefits and considerations associated with each option. It is also important to ensure that your school and/or child care facility population are familiar with the use of new fixtures or technology that may be installed.

When selecting a remediation provider, engage the local health department, public water system, and other available resources to ensure the organization performing remediation is qualified and reputable. Ask vendors for information on the schedule, health precautions that must be taken during and following remediation and request regular status updates on their progress prior to agreeing to work with any particular organization. The internal team should identify an individual that is responsible for working with the remediation contractors. This person should regularly communicate the schedule, activities, and hazards to the 3Ts Program team.

Immediate Response

Below are some immediate actions to consider following the receipt of results indicating elevated lead in drinking water.

Shut Off Problem Outlets

If initial sample results from an outlet exceed the remediation level, the outlet can be shut off or disconnected until the problem is resolved. Shutting off problem outlets can also provide a permanent solution. If the outlet is not used regularly, this may be a viable option; however, if the outlet is frequently used, this is probably not a practical long-term solution.

Share Test Results

Post test results in your facility (i.e., in the administrative offices), and on a public website. Notify staff, parents, and students of test results and actions you are taking. Also, reach out to the public water system to share results and discuss potential remediation measures.

Post "Not for Drinking/Cooking" at Problem Outlets

If initial sample results from an outlet exceed the remediation trigger level, but the problem outlet is routinely used for purposes other than human ingestion (e.g., hand-washing), clear signage can be posted to notify people that the outlet is not to be used for drinking or cooking until the problem is resolved.

Increase Awareness and Public Education

Take the initiative in providing information to your community. Be a good and reliable source of information on your program for reducing lead in drinking water. Be positive, proactive, and forthcoming when working with the media, members of the community, parents, students, and staff.

Short-Term Control Measures

Below are short-term measures facilities can take as they consider long-term or permanent control measures. You should consider the pros and cons of each before choosing what steps are most appropriate. As you implement short-term measures, you should also consider the benefit of remediation that removes the risk of lead contamination (noted in the Permanent Control Measures Section).

Provide Filters at Problem Taps

Point-of-use (POU) units are commercially available and can be effective in removing lead. There are a number of POU cartridge filter units on the market that effectively remove lead They can be relatively inexpensive ($65 to $250) or more expensive ($250 to $500), their effectiveness varies, and they may be vulnerable to vandalism. Filters need routine maintenance (e.g., cartridge filter units need to be replaced periodically) to remain effective.

To select a lead-reducing POU filter, check with the manufacturer or a third-party website (such as nsf.org or wqa.org) to verify the product was tested and certified against NSF/ANSI Standard 53 (for lead removal). For additional protection for particulate lead, look for a POU filter that is also certified against NSF/ANSI Standard 42 (for class I particulate reduction, 0.5 µm to <1 µm).

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POE vs POU: Point-of-entry (POE) and POU devices are different types of treatment options. A POU is installed at each outlet, while a POE is installed where the water enters the building. If you are considering installing a device to treat water entering their buildings, you should first consult with your state drinking water office. Installation of a POE device could lead to your facility being identified as a public water system under SDWA, and your facility could be required to meet the federal and state regulations for drinking water, including additional water quality monitoring. In addition, POE devices are not effective in remove lead that comes from plumbing materials within the school or child care facility.

Flush Taps Prior to Use

Flushing individual problem water outlets or all outlets within the school or child care facility may also represent a short-term solution. However, unless you can ensure lead levels remain low throughout the day, flushing just once a day or once a week is not recommended. If follow-up flush samples indicated no or low lead levels, facilities could use signage that notifies staff and students to flush for 30 seconds prior to each use. It is important to create schedules and ensure implementation of these practices until permanent control measures have been completed. See the **Flushing Best Practices** factsheet for additional information on outlet flushing instructions.

Provide Bottled Water

This can be an expensive alternative but might be warranted if you are aware of widespread contamination and other remediation is not a near-term option. If you use bottled water, be aware that it is not regulated by EPA but rather by the Food and Drug Administration (FDA). States may also regulate bottled water, and in some instances, these standards may be more stringent than the federal requirements. EPA recommends that you request a written statement from the bottled water distributor guaranteeing that the bottled water meets FDA and state standards. A copy of this letter should be recorded.

Permanent Control Measures

You can take a number of actions to permanently reduce or eliminate the sources of lead that originate in building plumbing. After obtaining an understanding of the water supply and the lead conditions in their facilities through testing, you should examine the permanent remediation options and select those most appropriate to their situation. The decision will be based on such factors as cost, likelihood of success, availability of water, and staffing requirements.

Replacement of Problem Outlets

After identifying the sources of lead contamination, replacing these identified outlets and any identified upstream plumbing components (e.g., valves, leaded solder) permanently address the problem, compared with other solutions that have long-term costs and risks. If the sources of lead contamination are localized and limited to a few outlets, replacement may also be the most cost-effective option in the short-term. EPA's revised March 2015 guidance, **How to Identify Lead-Free Certification Marks for Drinking Water System & Plumbing Products**, can be a useful resource selecting lead-free plumbing. Follow-up testing is also recommended, as with the other remedies, to ensure that the efforts result in reduced lead levels at the fixture outlets.

> Helpful Tip…
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> If multiple replacements of one type of component (for example, fountain valves) are needed, you may wish to purchase only one or two initially. Take follow-up water samples after installing the new component(s) to verify that lead levels are reduced to acceptable levels. If follow-up testing is satisfactory, you can be reasonably certain that the product would perform well at other locations in your facilities.

Pipe Replacement

Lead pipes within your property and portions of a lead service lines under your and/or public water system's jurisdiction can be replaced. Contact the public water system regarding jurisdiction. you may be responsible for replacing the portion of a lead service line that is on school or childcare property, rather than under the jurisdiction of the public water system.

Provide Filters at Problem Taps

Some facilities may also choose to use certified lead-reducing filters, also called Point of use (POU) units as a long-term or permanent control measure. When doing this, facilities should be sure to create maintenance schedules and identify a point of contact to be in charge of making sure they are properly maintained.

Reconfigure Plumbing

Ongoing renovation of school or childcare buildings may provide an opportunity to modify the plumbing system to redirect water supplied for drinking or cooking to bypass sources of lead contamination. Before undertaking such an alternative, be certain that you have properly identified all of the sources of lead contamination in drinking water. Follow-up testing is also necessary, to ensure that the efforts result in reduced lead levels at the drinking water outlets.

Helpful Tip…

Flushing can be a tool after remediation. In addition to replacing or removing lead containing plumbing or fixtures flushing can help clear out debris or lead particulates that may be released when remediation occurs.

Follow-Up Sampling

Once a remediation option has been selected and implemented, there are additional follow-up procedures that should be taken. Work with plumbers and maintenance staff to ensure that additional samples are taken from any outlets that were impacted by replacement of fixtures, reconfiguration of plumbing, or other remediation actions.

Ensure that additional samples are taken before a facility opens and before any water is used. Additional samples should follow the same testing process as the initial samples. Sample any replaced or reconfigured components using the recommended procedures for first-draw and/or flush samples. Be sure to document (e.g., in sample labeling) the conditions that follow-up samples were collected, such as after fixture replacement or after POU installation.

A comparison of original and additional samples will help to assess whether the remediation has been successful in reducing lead in drinking water. Additional samples may be required to further pinpoint sources of lead contamination, if lead levels are still elevated.

Follow-up sampling when flushing is being used

If flushing is selected as a remedy, follow-up testing procedures should include sampling to verify the effectiveness of flushing procedures at each problem outlet. If the 30-second flush sample (in Step 2) is low, flushing for 30 seconds may be sufficient.

In other cases, a longer flushing duration may need to be determined. See the Flushing Best Practices factsheet for additional information on outlet flushing instructions.

After determining the required flushing duration, repeat sampling should be collected after flushing, followed by a period of normal water use at the fixture, to determine whether flushing daily, twice daily, or at a different frequency is needed to ensure lead levels remain low throughout each day. For determining if once-daily flushing is sufficient, flush the outlet at the routine time and duration (e.g., 30 seconds) and then collect one 250-mL sample near the end of the day (e.g., after 10 hours of representative water usage following morning flushing). If the sample collected at the end of the day contains high levels of lead, more frequent flushing (e.g., every 4 hours or every time the outlet is used) or a different remedy should be evaluated.

Considerations for Replacement Activities

When making any repairs, ensure that "lead-free" materials are used. Make sure that any plumber who does repair or replacement work on the facility's plumbing system uses only "lead-free" solders and other materials. The 1986 Safe Drinking Water Act Amendments and the 2011 Reduction of Lead in Drinking Water Act require that only "lead-free" materials be used in new plumbing and plumbing repairs. Make sure all plumbers and other workers adhere to these requirements. These actions will prevent or minimize new lead from being introduced into the facility's plumbing system. Report any violations of the "lead-free" requirements to the local plumbing inspector, the state drinking water program or EPA.

Electrical current may accelerate the corrosion of lead in piping materials, so also consider checking grounding wires. Existing wires already grounded to the water pipes can in some cases be removed by a qualified electrician and replaced by an alternative grounding system. If local or state building codes allow, consider finding an alternative grounding system and having a qualified electrician make the change. Be aware that the removal of grounding from water pipes may create a shock hazard unless an acceptable, alternative ground is provided.

Communication Plan: Share your plans to remediate if elevated lead is found. This may include short-term or permanent measures.

Don't forget to maintain a record!

Record remediation efforts, schedules for upkeep and maintenance, and partners and contacts that assisted in your efforts.

Establishing Routine Practices

Schools and child care facilities should establish routine practices to reduce exposure to elevated lead levels and other environmental hazards (e.g., bacteria). **These activities should not be conducted immediately prior to collecting a water sample but should be planned as part of the school's or child care facility's overall water management program to improve drinking water quality.** Below are examples of routine activities that should be conducted to prevent exposure to drinking water contaminants:

Cleaning

- Clean drinking water fountains regularly. Consider posting a cleaning time card by the water fountains to allow the cleaning times to be recorded.
- Create an aerator (faucet screen) and water fountain strainer cleaning maintenance schedule and clean debris from all accessible aerators and strainers frequently. Establish a recordkeeping procedure to record when the aerators and strainers are cleaned.
- Consider setting a reminder on the calendar to notify the maintenance staff when it is time to clean the aerators and water fountain strainers.

Temperature Control

- Use only cold water for food and beverage preparation. Hot water will dissolve lead more quickly than cold water and may contain increased lead levels.
- If hot water is needed, it should be taken from the cold water faucet and heated on a stove or in a microwave oven. Consider creating notices that can be posted in the food and beverage preparation areas to remind students and staff to use cold water.

Point-of-Use Filter Maintenance

- If POU devices have been installed, make sure they are maintained. An example of a POU device is a filter on a faucet or within a drinking water fountain or water bottle filler.
- Ensure that the selected POU device is certified to remove lead (or any other contaminants of concern). To select a lead-reducing POU filter, check with the manufacturer or a third-party website (such as nsf.org or wqa.org) to verify the product was tested and certified against NSF/ANSI Standard 53 (for lead removal). For additional protection for particulate lead, look for a POU filter

that is also certified against NSF/ANSI Standard 42 (for class I particulate reduction, 0.5 µm to <1 µm).

- Consider setting a reminder on the calendar when it is time to change the filter.

Cross-Connections Control

- Evaluate the facility for the presence of cross-connections (e.g., connections of nonpotable water to potable sources) and address any issues.

Communication

- Create and post placards near bathroom sinks with notices that water should not be consumed. As an example, indicate that a sink is a hand-washing only sink to prevent students and staff from misunderstanding and utilizing sinks for brushing teeth, washing food or other activities that ultimately result in water being consumed.
- Use pictures if there are small children using bathrooms.
- Consider organizing an event for the community to explain how everyone can help.

See the Flushing Best Practices Factsheet for more information.

Routine Flushing Practices

- Regularly flush all water outlets used for drinking or food preparation, particularly after weekends and long vacations when water may have been stagnant for a long period of time.
- Flushing involves opening valves and faucets and letting the water run to remove water that has been standing in the interior pipes and/or the outlets. The flushing time varies by the type of outlet being cleared.
- Be careful not to flush too many outlets at once. This could dislodge sediments that might create further lead problems, or it could reduce pressure in the system below safe levels. If the flow from outlets is reduced noticeably during flushing, too many outlets have likely been turned on at once.

Flushing Directions by Outlet Type

Remember that each drinking water outlet should be flushed individually; flushing a toilet will not flush the water fountains. All flushing should be recorded in a log submitted to the individual in charge of this program.

Locate the faucet furthest away from the service line on each wing and floor of the building, open the faucets wide, and let the water run for 10 minutes. For best results, calculate the volume of the plumbing and the flow rate at the tap and adjust the flushing time accordingly. This 10-minute time-frame is considered adequate for most buildings.

Open valves at all drinking water fountains without refrigeration units and let the water run for roughly 30 seconds to one minute, or until cold.

Let the water run on all refrigerated water fountains for 15 minutes. Because of the long time period required, routinely flushing refrigerated fountains may not be feasible. It may therefore be necessary, and more economical, to replace these outlets with "lead-free" NSF-approved devices.

Open all kitchen faucets (and other faucets where water will be used for drinking and/or cooking) and let the water run for 30 seconds to one minute, or until cold.

Flushing is not recommended as a practical remedy for water coolers.

Communication Plan: Your continual effort to improve water quality in your facility will be of interest to parents, staff, and the community. Consider sending updates in newsletters.

Don't forget to maintain a record!

Record schedules for upkeep and maintenance and set calendar reminders to help you keep on schedule.