High Results Due to Particulate Lead

If initial first-draw sampling results reveal high lead levels in the 250-mL sample for a given outlet, a contributing source of the elevated lead levels could be the debris in the aerator or screen of the outlet. By cleaning the aerator or screen and retesting the water following the initial first-draw sampling procedures, you can identify whether or not the debris is contributing to elevated lead levels.

Determining aerator/screen debris contribution:

Scenario 1: The initial sample result is 19 ppb; you decide to see if the aerator is contributing to lead in the water. After cleaning out the aerator, you take another first-draw sample. The results come back less than or close to the detection level (e.g., 1ppb). This result indicates that the debris in the aerator was likely contributing to elevated levels in the fixture. Continue to clean the aerator on a regular basis; continued use of the outlet should be acceptable. However, please note that without regular maintenance, this outlet may serve water with elevated lead levels.

Scenario 2: The initial sample result is 22 ppb; you decide to see if the aerator is contributing to lead in the water. After cleaning out the aerator, you take another first-draw sample. The second sample result is very close or equivalent to the 22 ppb sample. Since the initial sample and post-cleaning first-draw sample results are similar, the problem is likely not the aerator.

Scenario 3: The initial first-draw sample result is 60 ppb; you decide to see if the aerator is contributing to lead in the water. After cleaning the aerator, you take another first-draw sample. The post-cleaning sample result is 25 ppb. Although the results are lower, they are still high; this indicates that the aerator is likely a contributing source and that the outlet itself and/or the plumbing upstream of the aerator are contributing as well. If this situation occurs, the school should take this fixture offline, and continue with 2-step sampling, or consider the Detailed Fixture Evaluation in Appendix D to target the additional contributing sources.

* When taking a second first-draw sample, please remember to follow the same sampling procedure as the initial first-draw sample. Ensure that fixtures and outlets have been out of use for 8-18 hours, sampling before students arrive at the facility.

Picture of an aerator with particulate

Step 2: Follow-Up Flush Samples

If initial test results reveal elevated lead, follow-up flush testing described in Step 2 is recommended to determine if the lead contamination results are from the fixture or from interior plumbing components. Follow-up flush samples generally involve the collection of water from an outlet where the water has run for 30 seconds.

The purpose of Step 2 is to pinpoint where lead is getting into drinking water (i.e., fixtures versus interior plumbing) so that appropriate corrective measures can be taken.

Procedures for initial outlet samples are shown below:

- As with initial first-draw samples, follow-up flush samples are to be taken before a facility opens and before any water is used. For best results, flush samples from different outlets that are in close proximity should be collected on different days. For drinking fountains or other fixtures that are manifolded closely together, a single flush sample may be representative of the shared interior plumbing.
- The sampler should be careful to maintain a consistent rate of flow when collecting flush samples.
- Open up the tap and let the water run for 30 seconds. Then, take a 250mL sample. Make sure to label this sample bottle as the flush sample.

STEP 2

250-mL Flush Sample

If the result of Step 1 is high, take a 30-second flush sample to identify lead in the plumbing behind the fixture.

Sampling Dos and Don'ts

Do:

- Follow the instructions provided by the laboratory for handling sample containers to ensure accurate results.
- Assign a unique sample identification number to each sample collected. Use a coding scheme to help differentiate samples, and don't forget to label each sample bottle.
- Collect all water samples before the facility opens and before any water is used. The water should sit in the pipes unused for at least 8 hours but not more than 18 hours before a sample is taken.
- Learn how water flows in your facility. If there are multiple floors, it is typically recommended to sample from the bottom floor and continue up. Start sampling closest to the main and work away.

Don't:

- Remove aerators prior to sampling. Potential sources of lead may be missed if aerators are removed, since debris could be contributing to the lead in drinking water if particles containing lead are trapped behind aerator screens.
- Flush water prior to sampling, unless instructed to do so. Flushing can be a tool to improve water quality, especially after long holidays or weekends. However, flushing prior to sampling may cause results showing lower-than representative lead levels in the water. See **Flushing Best Practices Factsheet** for more information.
- Close the shut-off valves to prevent their use prior to sample collection. Minute amounts of scrapings from the valves can produce results showing higher-than-representative lead levels in the water.

Don't forget to maintain a record!

Recording sample information is critical to tracking and managing water quality year-over-year. Record sampling procedures, locations, and results.

Module 6: Remediation and Establishing Routine Practices

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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).

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...
>
> 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

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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.

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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.

Keep Records

Finally, it is important to keep an ongoing record of partners, team contacts, testing efforts, remediation efforts, public outreach, and communication activities. Keep copies of past communication materials and dates they were sent out. It is imperative to be able to prove steps were taken to inform the public on lead issues. Strong recordkeeping can also prove to be helpful in illustrating what steps you have taken to notify the public of testing efforts and results.

Furthermore, recordkeeping is important for the "Taking Action" portion of the program—by documenting their outreach and the public's response, you can learn how to improve upon their public communication plan. For example, it might be helpful to keep a running log of questions received from the community that could be addressed in future communications. As mentioned previously, you could create a separate email address for the lead program so that questions are sent to a single point of contact.

See the 3Ts Toolkit for recordkeeping templates and customizable forms.

Appendix A: Glossary of Terms

Aerator: Also called a "screen" is typically located on the fixture valve (e.g., where the water comes out) to improve water flow out of a tap or drinking water fountain. These aerators can collect sediment and lead particulate and should be cleaned regularly. See the Establishing Routine Practices Section for more detail.

Chiller: A central refrigeration unit providing cold water to some types of drinking water fountains.

Corrosion: A dissolving and wearing away of metal caused by a chemical reaction (e.g., between water and the piping that the water contacts).

Cross-connection: A cross-connection is a point in a plumbing system where it is possible for a nonpotable substance to come into contact with the potable drinking water supply.

Detailed Fixture Evaluation: A sampling process designed to pinpoint where (i.e., fixtures or interior plumbing) lead is getting into drinking water so that appropriate corrective measures can be taken.

Drinking Water Fountain: A fixture connected to the water supply that provides water as needed. There are different types of drinking water fountains: fountains without central chillers, fountains with central chillers, water coolers, bottled water fillers, etc.

Faucet: A valved outlet device attached to a pipe that normally serves a sink or tub fixture. A faucet discharges hot and/or cold water for a variety of consumptive uses, including drinking, cooking, and washing. The term "faucet" is used interchangeably with the term "tap."

First-Draw Samples: These are the samples taken immediately after turning on the faucet or valve, without spilling, if possible. These samples represent the lead content of water sitting in water outlets that are used for drinking or cooking within the building(s).

Fittings: These are generally static parts that are used to join sections of pipe, or to join pipe to outlet fixtures.

Flush Samples: These samples are taken after water has been running from the fixture for some pre-determined length of time. They can be used to determine if lead is coming from the fixture itself or from interior plumbing.

Flux: A substance applied during soldering to facilitate the flow of solder. Flux often contains lead and can itself be a source of lead contamination in water. The "lead-free" requirements of the 1986 Safe Drinking Water Act Amendments require that solders and flux not contain more than 0.2 percent lead.

Fountain Valve: The valve and discharge device that mounts on top of the bubbler fixture and discharges water for consumption. This document does not distinguish bubbler drinking water fountains from other types of fountains. Therefore, the term "fountain valve" is used interchangeably with bubbler valve.

Header: The main pipe in the internal plumbing system of a building (*see Interior Plumbing definition below for context within this document*). The header supplies water to lateral pipes.

Inlet: A location where the water enters a plumbing component, such as where the water from the pipes enters a central chiller (defined above).

Interior Plumbing: For the sake of this document, interior plumbing is the plumbing within the wall and upstream of the fixture.

Lateral: A plumbing branch between a header or riser pipe and a fixture or group of fixtures. A lateral may or may not be looped. Where more than one fixture is served by a lateral, connecting pipes are provided between the fixtures and the lateral.

Lead-free: Per the Reduction in Lead Drinking Water Act of 2011: not containing more than 0.2 percent lead when used with respect to solder and flux; and not more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures.

Outlet: A location where water may be accessed for consumption, such as a drinking fountain, water faucet or tap.

Potable Water Pipe: The pipe in a distribution system and in a building which carries water intended for human consumption.

Public Water System: Any system for the provision of water for human consumption through pipes or other constructed conveyances if the system has 15 or more service connections, or regularly serves an average of at least 25 persons daily at least 60 days per year.

Riser: The vertical pipe that carries water from one floor to another.

Sediment: Matter from piping or other water conveyance device that settles to the bottom of the water in the apparatus. If lead components are used in plumbing materials, lead sediments may form and result in elevated water lead levels.

Sequential Samples: Water samples collected at the fixture, one after another, without flushing beforehand or wasting water in between samples.

Service Line: Also called a connection line. The pipe that carries tap water from the public water main to a building. Service lines were often composed of lead materials, particularly those installed prior to 1986.

Source Water: Untreated water from streams, rivers, lakes or underground aquifers that is used to supply private wells and public drinking water.

Solder: A metallic compound used to seal the joints between pipes. Until 1986, solder containing up to 50 percent lead was legally used in potable water plumbing and the law prohibiting that may not have been enforced in your state until 1990. "Lead-free" solders, which can contain up to 0.2 percent lead, often contain one or more of the following metals: antimony, tin, copper or silver. Several alloys are available that melt and flow in a manner similar to lead solder.

Strainers: Are typically located within the fixture itself (e.g., at the inlet to a water fountain or cooler) and collect debris and/or sediment. These strainers should be checked and regularly cleaned since they can be a contributing source of elevated lead levels.

Valve: A mechanical device by which the flow of water may be started, stopped or regulated by a movable part that opens, shuts or partially obstructs one or more ports of passageway.

Water Cooler: A mechanical device affixed to drinking water supply plumbing that actively cools water for human consumption. The reservoir can consist of a small tank or a pipe coil.

Appendix B: Lead Water Coolers Banned in 1988

Lead Water Coolers Banned in 1988

The Lead Contamination Control Act (LCCA), which amended the Safe Drinking Water Act (SDWA), was signed into law on October 31, 1988 (P.L. 100-572). The potential of water coolers to contribute lead to drinking water in schools and child care centers was a principal focus of this legislation. Specifically, the LCCA mandated that the Consumer Product Safety Commission (CPSC) order the repair, replacement, or recall and refund of drinking water coolers with lead-lined water tanks. In addition, the LCCA called for a ban on the manufacture or sale in interstate commerce of drinking water coolers that are not "lead-free." Civil and criminal penalties were established under the law for violations of this ban. With respect to a water cooler that may come in contact with drinking water, the LCCA (Section 1461 of SDWA) defines the term "lead-free" to mean:

not more than 8 percent lead, except that no drinking water cooler which contains any solder, flux, or storage tank interior surface which may come in contact with drinking water shall be considered "lead-free" if the solder, flux, or storage tank interior surface contains more than 0.2 percent lead.

Another component of the LCCA was the requirement that EPA publish and make available to the states a list of drinking water coolers, by brand and model, that are not "lead-free." In addition, EPA was to publish and make available to the states a separate list of the brand and model of water coolers with a lead-lined tank. EPA is required to revise and republish these lists as new information or analyses become available.

Based on responses to a Congressional survey in the winter of 1988, three major manufacturers (the Halsey Taylor Company, EBCO Manufacturing Corporation, and Sunroc Corporation) indicated that lead solder had been used in at least some models of their drinking water coolers. On April 10, 1988, EPA proposed in the Federal Register (54 FR 14320) lists of drinking water coolers with lead-lined tanks and coolers that are not "lead-free." Public comments were received on the notice, and the list was revised and published on January 18, 1990 (Part III, 55 FR 1772). See the following page for a list of water coolers and lead components included on that list.

Important Note: The 1990 list is based on a definition of "lead free" in SDWA applicable to drinking water coolers only (SDWA Section 1461). At the time it was enacted, the 8% standard of the definition was the same as the definition of lead free in another section of SDWA applicable to pipes, pipe fittings, plumbing fittings and fixtures, solder, and flux (SDWA Section 1417). Since then, however, the definition of "lead free" for pipes, fittings, and fixtures in Section 1417 was changed as a result of the 2011, **THE REDUCTION OF LEAD IN DRINKING WATER ACT** to a weighted average of 0.25 percent of the wetted surface. **It is still important to test fixtures that are not on this list; especially if they were installed prior to 2014, the year THE REDUCTION OF LEAD IN DRINKING WATER ACT became effective.**

List of Water Coolers and Lead Components

EBCO Manufacturing

All pressure bubbler water coolers with shipping dated from 1962 through 1977 have a bubbler valve containing lead. The units contain a single 50-50 tin-lead solder joint on the bubbler valve. Model numbers for coolers in this category are not available.

The following models of pressure bubbler coolers produced from 1978 through 1981 contain one 50-50 tin lead solder joint each.

CP3	DP15W	DPM8	7P	13P	DPM8H	DP15M	DP3R	DP8A
DP16M	DP5S	C10E	PX-10	DP7S	DP13SM	DP7M	DP7MH	DP7WMD
WTC10	DP13M-60	DP14M	CP10-50	CP5	CP5M	DP15MW	DP3R	DP14S
DP20-50	DP7SM	DP10X	DP13A	DP13A-50	EP10F	DP5M	DP10F	CP3H
CP3-50	DP13M	DP3RH	DP5F	CP3M	EP5F	13PL	DP8AH	DP13S
CP10	DP20	DP12N	DP7WM	DP14A-50/60				

Halsey Taylor

Lead solder was used in these models of water coolers manufactured between 1978 and the last week of 1987:

WMA-1	SCWT/SCWT-a	SWA-1	DC/DHC-1
S3/5/10D	BFC-4F/7F/4FS/7FS	S300/500/100D	

The following coolers manufactured for Haws Drinking Faucet Company (Haws) by Halsey Taylor from November 1984 through December 18, 1987, are not lead-free because they contain 2 tin-lead solder joints. The model designation for these unites are as follows:

HC8WT	HC14F	HC6W	HWC7D	HC8WTH	HC14FH	HC8W	HC2F	HC14WT
HC14FL	HC14W	HC2FH	HC14WTH	HC8FL	HC4F	HC5F	HC14WL	HCBF7F
HC4FH	HC10F	HC16WT	HCBF7HO	HC8F	HC8FH	HC4W	HWCZ	

Lead Lined Tanks

Prior to publication of the January 1990 list, EPA determined that Halsey Taylor was the only manufacturer of water coolers with lead-lined tanks Below provides a listing of model numbers of the Halsey Taylor drinking water coolers with lead-lined tanks that had been identified by EPA as of January 18, 1990.

Based upon an analysis of 22 water coolers at a U.S. Navy facility and subsequent data obtained by EPA, EPA believes the most serious cooler contamination problems are associated with water coolers that have lead-lined tanks.

Since the LCCA required the CPSC to order manufacturers of coolers with lead-lined tanks to repair, replace, or recall and provide a refund of such coolers, the CPSC negotiated such an agreement with Halsey Taylor through a consent order published on June 1, 1990 (at 55 FR 22387). The consent agreement calls on Halsey Taylor to provide a replacement or refund program that addresses all the water coolers listed below as well as "all tank-type models of drinking water coolers manufactured by Halsey Taylor, whether or not those models are included on the present or on a future EPA list." Under the consent order, Halsey Taylor agreed to notify the public of the replacement and refund program for all tank type models.

Currently, a company formerly associated with Halsey Taylor, Scotsman Ice Systems, has assumed responsibility for replacement of lead-lined coolers previously marketed by Halsey Taylor. If a school or child care facility has one of the Halsey Taylor water coolers noted below, contact Scotsman Ice Systems to learn more about the requirements surrounding its replacement and rebate program.

Scotsman Ice Systems

775 Corporate Woods Parkway Vernon Hills, IL 60061

PH: (800) SCOTSMAN or 800-726-8762

PH: (847) 215-4500

Halsey Taylor Water Coolers with Lead-Lined Tanks

The following six model numbers have one or more units in the model series with lead-lined tanks:

WM8A	WT8A	GC10ACR	GC10A	GC5A	RWM13A

The following models and serial numbers contain lead-lined tanks:

WM14A Serial No. 843034	WM14A Serial No. 843006	WT11A Serial No. 222650
WT21A Serial No. 64309550	WT21A Serial No. 64309642	LL14A Serial No. 64346908

Appendix C: Develop a Code System for Samples

Develop a Code System for Samples

Code each outlet using a system that will allow each unique outlet to be identified by location, type and other relevant characteristics. The text below provides examples for coding by fixture type and sample type. The following is an example template that can be used to designate unique samples in single-building schools and child care facilities.

Floor-Room Number-Outlet Type-Sample Number

The following is an example that uses the structure above and the example codes to the right. An initial sample (P) was taken at a drinking water fountain (DW) on the 3rd floor (003) outside of room 312 (312) and is the 15th outlet counted (015). This sample would be coded as:

003-312-DW-P-015

If multiple buildings are being sampled, include the building number as well.

Building Number-Floor-Room Number-Outlet Type-Sample Number

Thus, if that same drinking water fountain was located in building 1 (01), it would be coded as:

01-003-312-DW-P-015

Important Note: when taking sequential samples, be sure to add a number to the sample to indicate the order the samples were taken in.

- **1SS** = First sequential sample
- **2SS** = Second sequential sample

For example, the first 125-mL sequential sample taken at that same drinking water fountain, would be coded as:

003-312-DW-1SS-015

Coding examples can include:

- DW = drinking water fountain
- WC = water cooler (chiller unit)
- CF = classroom faucet
- KF = kitchen faucet
- BF = bathroom faucet
- NS = nurse's office sink
- SC = service connector

As well as the type of sample taken:

- P = primary or initial sample
- F = flush
- SS = sequential sample

The coding should be identified on a site map, accompanied by a narrative that describes the observable conditions of each sampling location. It is also important to document any special conditions for the sampling, such as whether it was conducted after a remedy was implemented (e.g., after fixture/plumbing replacement, after POU filter installation), during a flushing evaluation (e.g., XX hours after morning flushing), or after aerator or inlet strainer cleaning so that results can be interpreted in the future.

Appendix D: Detailed Fixture Evaluation

The purpose of the detailed fixture evaluation is to pinpoint where (i.e., fixtures, cooler, interior plumbing) lead is getting into drinking water so that appropriate corrective measures can be taken.

Because the composition and dimensions of these fixtures vary, there are different sample collection procedures for each fixture. Using the partnerships established with the 3Ts Program, you may choose to request assistance with sampling from entities like public water systems, state drinking water programs or certified laboratories.

The following pages break down the sampling for five types of fixtures and explain how to interpret results:

- **Drinking Water Fountains**
- **Cold Water Faucet**
- **Drinking Water Fountains with Coolers**
- **Ice-Making Machine**
- **Central Chiller Unit**

Note: The graphics in this factsheet are meant to provide a general depiction of the plumbing being sampled. Each outlet is a little bit different; there may be instances where more or less of the plumbing is covered in the sample than is shown in the graphics.

Drinking Water Fountains

You will want to collect water so that the sample water has been in contact with the fixture and has been in contact with the connecting pipes (Exhibit 4). If the fountain has a chiller unit, see the Central Chiller Unit Section for additional sampling.

Helpful hint: Read the full instructions before sampling.

Sample 1A: Sampling the Outlet

Take this sample before the facility opens and before any water is used. Try to predict the arc of the water and take a 125-mL sample. Note this is a sequential sample. This sample is representative of the water that may be consumed at the beginning of the day or after infrequent use. It consists of water that has been in contact with the fountain or bubbler valve, shut-off valve and connecting pipe.

Sample 2A: Sampling the Connecting Pipe

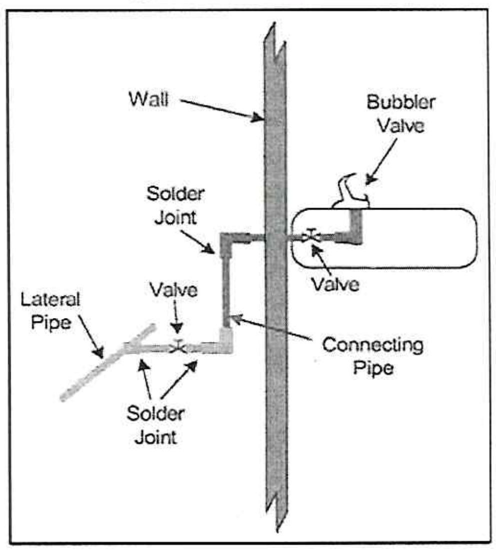
Without shutting off the water, take another 125-mL sample, trying not to spill. Be sure to record which sample was the first and which was the second sample. This is also a sequential sample.

This sample consists of water that has been in contact with the plumbing upstream of the outlet and the lateral pipe.

Sample 3A: Sampling the Interior Plumbing

Again, without shutting off the water, take a final 250-mL sample trying not to spill any water in between samples. This is also a sequential sample. This sample is representative of the water that is in the plumbing upstream from the fountain.

<u>Exhibit 4</u>. Targeted Locations of Water in Plumbing for Drinking Water Faucets



Interpreting Results: Drinking Water Fountains

To determine the source of lead in the water, compare the test results of samples **1A**, **2A** and **3A**.

- **IF** the lead level in the first 125-mL sample (**1A**) is higher than that of the second-125 mL sample (**2A**), **THEN** the fixture may be contributing lead and might need to be replaced.
- **IF** the lead level in the second 125-mL sample (**2A**) is higher than that of the first sample (**1A**), **THEN** the lateral pipe or shut-off valve may be contributing lead.

- **IF** the lead level in the 250-mL sample (**3A**) is lower (below 5 ppb), **THEN** very little lead is being picked up from the plumbing upstream from the outlet. The majority or all of the lead in the water is likely contributed from the drinking water fountain.

- **IF** the lead level in the 250-mL sample (**3A**) significantly exceeds 5 ppb (for example, 10 ppb), **THEN** lead in the drinking water could also be contributed by the plumbing upstream of the drinking water fountain. Compare all sample results to prioritize follow-up sampling and remediation. Outlets with elevated lead levels should not be made available for consumption.

Cold Water Faucet (i.e., Water Faucet, Water Tap, Kitchen Sink)

Water in this sample should consist of water that has been in contact with the faucet fixture and the lateral pipe (Exhibit 5).

Sample 1B: Sampling the Faucet

Take a 250-mL sample before the facility opens and before any water is used. **Note this is a sequential sample.**

Sample **1B** is representative of the water that may be consumed at the beginning of the day or after infrequent use. It consists of water that has been in contact with the fixture and the plumbing connecting the faucet to the lateral pipes. See Exhibit 5.

Sample 2B: Sampling the Interior Plumbing

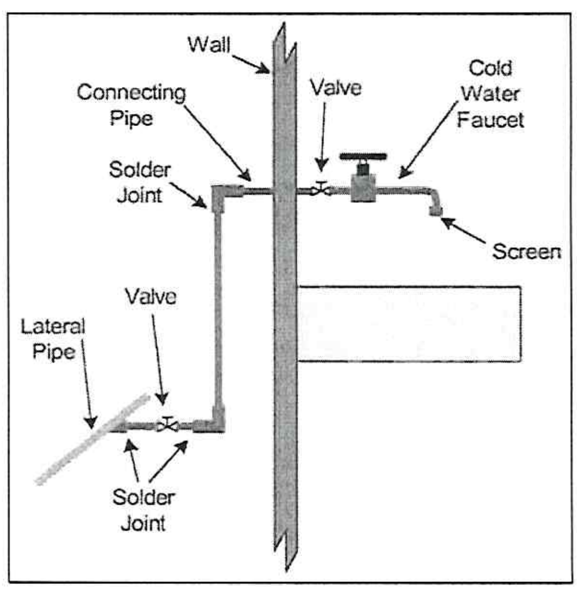
Without shutting off the water, take a second 250-mL sample, trying not to spill. Note this is also a sequential sample.

This sample is representative of the water that is in the plumbing upstream from the faucet.

Interpreting Results: Cold Water Faucets

To determine the source of lead in the water, compare the results of samples **1B** and **2B**.

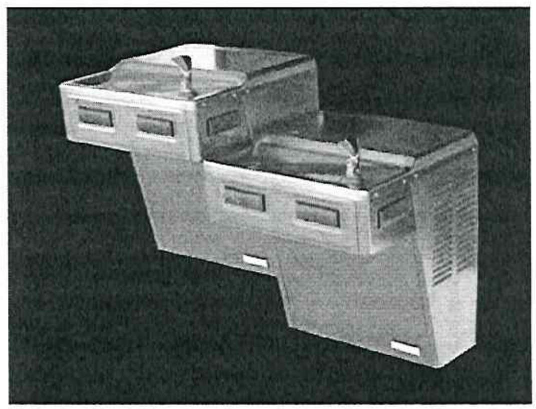
Exhibit 5. Targeted Locations of Water in Plumbing for Cold Water Faucets



- **IF** the lead level in sample **1B** is higher than that in sample **2B**, **THEN** the source of lead could be the water faucet and/or the plumbing upstream from the faucet.
- **IF** the lead level in sample **2B** is lower, close to 5 ppb, **THEN** very little lead is coming from the plumbing upstream from the faucet. The majority or all of the lead in the water is likely from the faucet and/or the plumbing connecting the faucet to the lateral.
- **IF** the lead level in sample **2B** significantly exceeds 5 ppb (for example, the level is 10 ppb), **THEN** lead may be coming from the plumbing upstream from the faucet.

Drinking Water Fountains with Coolers

Two types of water coolers are used in drinking water fountains: the wall-mounted and the free-standing types. Water in these coolers is stored in a pipe coil or in a reservoir. Refrigerant coils in contact with either of these storage units cool the water. Sources of lead in the water may be the internal components of the cooler, including a lead-lined storage unit; the section of the pipe connecting the cooler to the lateral pipe; and/or the interior plumbing of the building (Exhibit 6).



Flushing the Afternoon Before

In order to sample this outlet, you need to flush the outlet the afternoon before sampling. Flushing times will be dependent on the cooler tank size, but a 15-minute flush should get to the piping upstream of the cooler and ensure that no stagnant water is left in the storage unit.

Sample 1C: Sampling the Outlet

Take a 125-mL sample before the facility opens and before any water is used. Collect the water immediately after opening the fountain or bubbler valve without allowing water to run. **Note this is a sequential sample.**

The sample consists of water that has been in contact with the fountain or bubbler valve and the plumbing inside the outlet.

Sample 2C: Sampling the Water Cooler

Without shutting off the valve, take a 250-mL sample immediately after sample **1C**, trying not to spill any water. **This is also a sequential sample**.

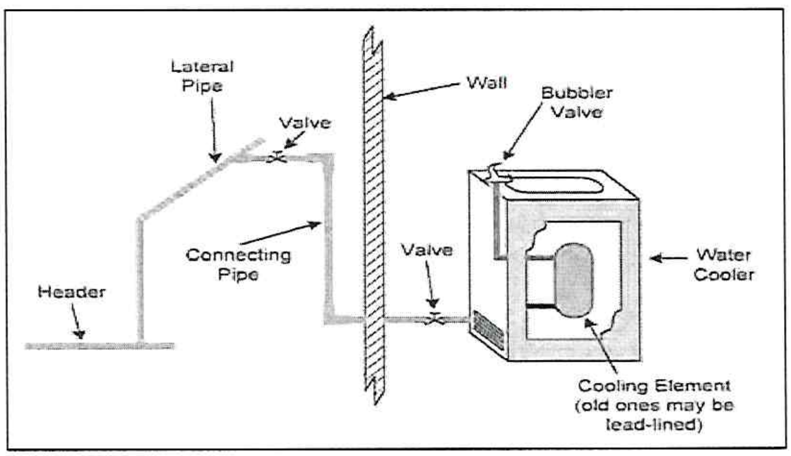
Because the water in the cooler was flushed the previous afternoon, this sample is representative of the water that was in contact with the cooler overnight, not in extended contact with the plumbing upstream.

Interpreting Results: Drinking Water Fountain Coolers

To determine the source of lead in the water, compare the test results of samples **1C**, **2C**, and **3C**.

- **IF** the lead level concentration in the first 250-mL sample (**2C**) is high AND is greater than or equal to the lead level concentration of sample **1C**, THEN the source of the lead may be sediments contained in the cooler storage tank, screens or the plumbing upstream from the cooler.
- **IF** the lead level concentration in the first 125-mL sample (**1C**) is greater than the sample **2C** concentration, **THEN** bubbler valve may be contributing lead.

Exhibit 6. Targeted Locations of Water in Plumbing for Water Fountains with Coolers



Eliminating Particulate Lead as a Source

If the detailed fixture results reveal there are high lead levels of lead in the cooler sample, a contributing source of the elevated levels could be the debris in the aerator or screen of the fixture. By cleaning the aerator or screen and retesting, you can determine whether the debris is a contributing source to elevated lead levels in their facilities.

Determining aerator/screen debris contribution:

Turn off the valve leading to the cooler. Disconnect the cooler from the plumbing and look for a screen at the inlet. Remove the screen. Some coolers also have a screen installed at their bubbler or fountain valve. Carefully remove the valve by unscrewing it. Some coolers are equipped with a drain valve at the bottom of the water reservoir that may also catch debris. Clean it all. Then take a 250-mL sample (**3C**).

Interpreting Results: Cooler

- **IF** the concentration of sample **3C** is less than 5 ppb **THEN** the lead could be coming from debris in the cooler or the screen.
- **IF** the concentration of sample **3C** is much greater than 5 ppb **THEN** the lead is likely coming from debris in the cooler or on the screen.
- **IF** the concentration of sample **3C** is much greater than 5 ppb AND less than sample **1C THEN** the source of lead may be sediments contained in the cooler, screens, and/or the upstream plumbing. Routine flushing practices should be implemented to reduce exposure from lead particulates.

Ice-Making Machine

You will want to collect water so that the sample water has been in contact with the ice making machine and with the plumbing upstream (Exhibit 7).

Sample 1D: Sampling the Ice

Fill a suitable container (250-mL or larger, wide-mouthed bottle or other container) provided by the laboratory at least three-quarters full with ice. Do not touch the ice with bare hands. Use the non-metal scoop or disposable plastic gloves provided by the laboratory to place the ice in the container. The results of **1D** can be used to determine if sample **2D** is needed.

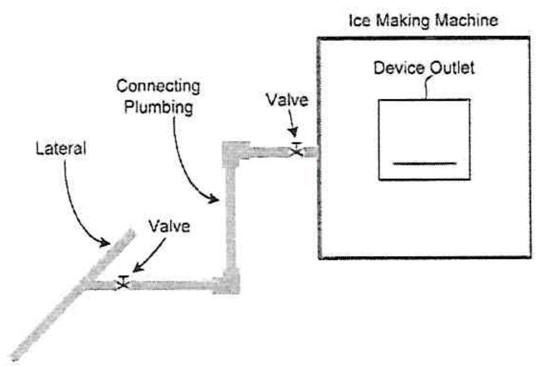
Note: If there are high lead levels in the initial sample (**1D**), then collect sample **2D** to determine if the source of the lead is the plumbing or the ice making machine itself.

Sample 2D: Sampling the Plumbing

Disconnect the ice maker from the plumbing and look for a screen at the inlet. Remove the screen. Clean out the debris, if debris is present. Clean the screen routinely to avoid accumulations of debris.

Collect the sample from the disconnected plumbing as close to the ice maker as possible. Fill the sample container with 250-mL of water immediately after opening the faucet or valve. If no faucet is available, contact the ice machine manufacturer for recommendations that will minimize disruption of existing plumbing.

Exhibit 7. Targeted Locations of Water in Plumbing for Ice Making Machines



Interpreting Results: Ice-Making Machine

- **IF** the lead level in sample **2D** is lower (below 5 ppb), **THEN** the source of the lead may be in the ice maker.
- **IF** the lead level in sample **2D** significantly exceeds 5 ppb (for example, the level is 10 ppb), **THEN** lead could also be contributed from the plumbing upstream from the ice maker.
- Follow-up samples from the supplying system may also need to be taken to identify the source of lead.

Central Chill Unit

Sample 1E: Sampling the Plumbing Supplying the Chiller

Take a 250-mL sample from a faucet or valve as close to the inlet of the chiller as possible. If no outlet is available, contact the chiller manufacturer for recommendations that will minimize disruption of existing plumbing. If a sample faucet or valve is available, collect the sample immediately after opening the outlet, without allowing any water to go to waste.

This sample is representative of water that has been in contact with the plumbing supplying water to the chiller.

Sample 2E: Sampling the Connecting Pipe

Take a 250-mL sample from a faucet or valve as close to the outlet of the chiller as possible. If no outlet is available, contact the chiller manufacturer for recommendations that will minimize disruption of existing plumbing.

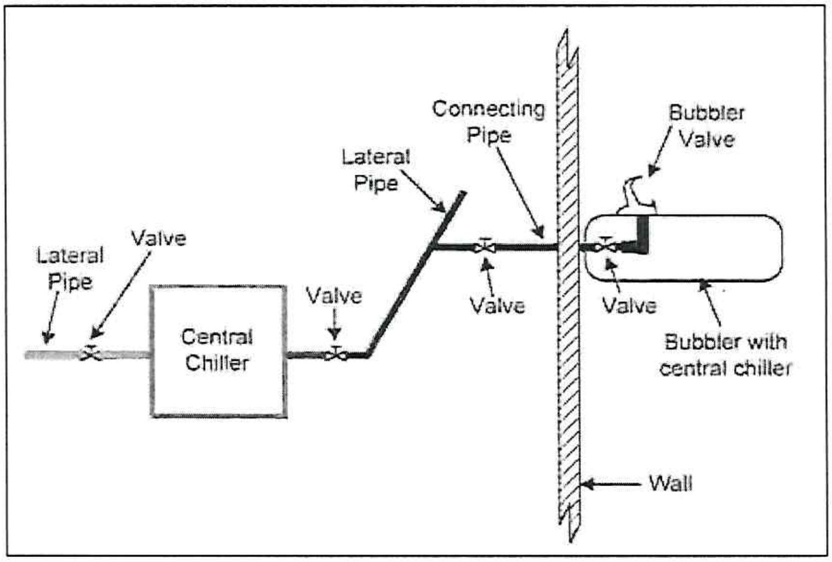
This water sample consists of water that has been in contact with the chiller unit and the plumbing upstream, which supplies water to the chiller. Often, water supplied to the fountains is recirculated to the chiller unit. In this instance, sample **2E** consists of a mixture of water from the water supply and any water that may be recirculated from the plumbing supplying water to the fountains.

Interpreting Results: Central Chiller Unit

Note: You will need the results from samples collected at the drinking water fountain (Exhibit 4) covered earlier in this section.

- **IF** the lead level in sample **3A** (the drinking water fountain sample) is higher than that in sample **2E** (the second 250-mL central chiller sample), **THEN** lead could be contributed by the plumbing supplying the water from the chiller to the fountain.
- **IF** the lead level in sample **2E** is higher than in sample **1E**, **THEN** a portion of the lead may be coming from the chiller.
    - **Note**: Sludge and sediments containing high levels of lead may accumulate in chiller tanks. If the test results indicate that lead is coming from the chiller unit, check for the presence of debris and sludge. Remove any of these materials from the chiller, flush the chiller unit, and resample the water.
- **IF** the lead level in sample **1E** is lower (close to 5 ppb), **THEN** very little lead is being picked up from the plumbing upstream from the chiller. The majority of the lead in the water may be attributed to the chiller and the plumbing downstream from the chiller.
- **IF** the lead level in sample **1E** is very high (above 20 ppb), **THEN** there could be lead sources upstream from the chiller and you may need to contact a plumber to further diagnose.

Exhibit 8: Targeted Locations for Water in Plumbing for Central Chillers



Additional Sampling Information

Sample Documentation

Record the unique sample identification number on each sample bottle and on the recordkeeping form. An example form is provided in Appendix F. The information recorded will include:

- Type of sample taken (e.g., initial first-draw)
- Date and time of collection
- Name of the sample collector
- Location of the sample site
- Name of the outlet manufacturer, and the outlet's model number, if known
- Model number of faucets, valves, and other visible fixtures; include digital photos in sampling records, if possible
- Water treatment already in place in the building (i.e., point-of-entry (POE) devices) or filters (point-of-use (POU) devices).

Additional Interior Plumbing Samples

In general, if lead levels remain high in samples taken from drinking water outlets, and the source cannot be determined, additional samples from upstream sample sites in the interior plumbing should be collected. The Detailed Fixture Evaluation can further help in determining potential lead sources.

The configuration of interior plumbing will vary depending on the layout of a given building and type of outlet. Construction materials may also vary, especially in larger buildings where additions and repairs have been made to the original structure.

At this point, if not done already, you may also want to contact a professional to assist in collecting interior plumbing samples. you should also consider the installation of filters.

Sampling for Other Parameters

In addition to monitoring for lead, you may wish to monitor for other parameters that may provide an indication of problems in your plumbing. However, note that analysis costs will increase as the number of parameters increases. Some other parameters include bacteria, cadmium, color, copper, iron, turbidity, and zinc. See Table below.

Contaminant	Limit	Concern
Bacteria	Absent	Bacteria are present throughout our environment. They have adapted to live and reproduce in a variety of environments, including inside animals and humans, and in water, soil, and food. If bacteria are present in drinking water sources, most are removed during the disinfection process. However, some may survive and enter the distribution system (the building's pipes and plumbing). Bacteria can also grow within the plumbing system, water fountains, and faucets.
Cadmium	5 ppb	A regulated toxic metal found in low levels in galvanized pipe. The maximum allowable level at the water treatment plant is 5 ppb. However, the presence of cadmium at any level indicates that corrosive conditions may exist in the plumbing.
Color	15 color units	An aesthetic parameter that may indicate the presence of iron oxides. Iron oxides are often present in iron or steel pipe as a result of corrosive conditions.
Copper	1300 ppb	A regulated metal used to make copper piping. The presence of copper in water samples taken from copper piping is not unusual, but higher levels indicate that corrosive conditions may be a concern.
Iron	300 ppb	An aesthetic parameter that is indicative of corrosive conditions at higher levels. See also color and turbidity. (Galvanized pipe is made of iron.)
Turbidity	1 turbidity unit	A measurement of the clarity of water. Higher turbidity values may indicate the presence of iron oxides. Iron oxides are often present in iron or steel pipe as a result of corrosive conditions.
Zinc	5000 ppb	An aesthetic parameter that is indicative of corrosive conditions at higher levels. Zinc is used in making galvanized piping products. The presence of zinc in water samples taken from galvanized piping is not unusual, but higher levels indicate that corrosive conditions may be a concern.

Appendix E: Preservation of Samples

In order to avoid analytical errors, pay particular attention to proper collection and handling of the sample before analysis. Sample containers (250-mL) should be obtained from a certified laboratory. The containers should have wide openings for easier sample collection and to allow samples to be collected with the water flowing at normal flow rates (i.e., A container with a narrow opening would make it difficult to collect water from a faucet that is turned on at the normal flow rate. Water collected from a faucet that is turned on "low" may not be representative of normal usage.) Other containers such as used jars or water bottles should not be used.

Make sure the containers are kept sealed between the time of their preparation by the lab and the collection of the sample. This will assure that no contaminants from the outside are introduced. If also taking bacteria samples, preserve the samples by icing, and promptly ship or deliver it to the laboratory. Most laboratories will provide the necessary shipping containers and cold packs. Upon receipt, the laboratory will acidify the sample. The sample can be held up to 14 days prior to acidification without loss of lead through absorption, but EPA recommends that you ship your samples as soon as possible.

It is best to have water samples analyzed for "total lead" rather than "dissolved lead." Many laboratories may recommend the dissolved lead test because it is cheaper, but this test does not analyze for particulate lead, which can only be measured using the "total lead" test. However, both tests can also be conducted in order to determine if particulate lead is a problem. The difference in value of lead between the two results can be used to calculate particulate lead.

A certified drinking water laboratory should be aware of these requirements. In addition, the laboratory may provide qualified individuals to collect samples or sample containers and instructions. The sample containers may have been prepared prior to reaching the school or child care facility. The laboratory will also specify how to handle the sample containers and when to submit them after taking the samples.

When the laboratory returns the test results, the concentrations of lead in the drinking water samples will be reported in metric form such as milligrams per liter (mg/L) or micrograms per liter (µg/L), or they will be reported as a concentration such as parts per million (ppm) or parts per billion (ppb), respectively.

Milligrams per liter (**mg/L**) is the same as parts per million (**ppm**).

Micrograms per liter (**µg/L**) is the same as parts per billion (**ppb**).

Examples:

- 1 mg/L = 1000 µg/L = 1 ppm = 1000 ppb
- 0.020 mg/L = 20 µg/L = 0.02 ppm = 20 ppb

For more detailed information, refer to the following documents:

Methods for the Determination of Metals in Environmental Samples. U.S. EPA/600/4-94/111. May 1994 (available from the National Technical Information Service, Pub. No. PB95-125472 (703) 487-4650).

Manual for the Certification of Laboratories Analyzing Drinking Water. U.S. EPA 815-R-05-004. January 2005 (available from the National Technical Information Service (703) 487-4650).

Standard Methods for the Examination of Water and Wastewater, 22nd Edition. Co-published by the American Public Health Association, the Water Environment Federation and the American Water Works Association. 2012 (available from the American Water Works Association, ISBN # 0-87553-013-3, Catalog #10085).

Appendix F: Example Sampling Field Form

Building Name:	**Sample Date (MM/DD/YYYY):**	**Sampler's Email:**
Building Number:	Sampler's Name:	Sampler's Phone:

Sample Id = Building Number-Floor-Room Number-Outlet Type-Sample Number (e.g., 01-03-312-DW-P-015)

Outlet Type Codes

DW = drinking water fountain | KF = kitchen faucet | WC = water cooler (chiller unit) | BF = bathroom faucet

CF = classroom faucet | NS = nurse's office sink

Sample ID	Model #	Time	Color *(describe)*	Filter	Filter Date *(MM/DD/YYYY)*	Location Notes	Lab Sample ID *(Lab use only)*
01-03-312-DW-P-015	SF – 7080	5:30am		☐Yes ☐No	10/14/2016	DW in next to room 312	

Chain of Custody:

1. Released By:	Received By:	Date/Time:	#of Samples:
2. Released By:	Received By:	Date/Time:	#of Samples:
3. Released By:	Received By:	Date/Time:	#of Samples:

General Notes:

Appendix G: Plumbing Profile

This questionnaire is designed to assist with determining whether lead is likely to be a problem in a facility. A separate plumbing profile may be needed for each building, addition or wing of the facility, especially if the construction of each took place at different times. The questions in the left column will help to determine whether lead is likely to be a problem in a facility and will enable sampling effort prioritization. The middle column is where questions should be answered. Use the right column as a guide to interpret the answers and gain a better understanding of the significance of possible answers. Some of the questions in this questionnaire may not apply to a facility for various reasons. Skip those questions that do not apply.

Plumbing Profile Question	What Answers to the Plumbing Profile Questions Mean
1. When was the original building constructed? Were any buildings or additions added to the original facility? If so, complete a separate plumbing profile for each building, addition or wing.	**Older Buildings** – Through the early 1900s, lead pipes were commonly used for interior plumbing in certain parts of the country. Plumbing installed before 1930 is more likely to contain lead than newer pipes. After 1930, copper generally replaced lead as the most commonly used for water pipes. Up until the mid- to late-1980s (until the "lead-free" requirements of the 1986 Safe Drinking Water Act Amendments took effect), lead solder was typically used to join these copper pipes. The efforts of a public water system over the years to minimize the corrosiveness of the water may have resulted in a protective coating of mineral deposits forming on the inside of the water pipes (passivation). This coating insulates the water from the plumbing and generally results in decreased lead levels in water. If the coating does not exist or is disturbed, the water is in direct contact with any lead in the plumbing system. **Newer Buildings** – New buildings are not likely to have lead pipes in their plumbing systems, but they are very likely to have copper pipes with solder joints. Buildings constructed prior to the late 1980s, before the "lead-free" requirements of the 1986 Safe Drinking Water Act Amendments, may have joints made of lead solder. Buildings constructed after this period should have joints made of "lead-free"

Plumbing Profile Question	What Answers to the Plumbing Profile Questions Mean
	solders. In addition, "lead-free" brass fixtures or plumbing components purchased or installed prior to 2014, the Reduction of Lead in Drinking Water Act effective date, were allowed to contain higher levels of lead. Even if "lead-free" materials were used in new construction and/or plumbing repairs, lead leaching may occur. See the Training Section for more information on the "lead-free" requirements.
2. If built or repaired since 1986, were "lead-free" plumbing and solder used in accordance with the "lead-free" requirements of the 1986 Safe Drinking Water Act Amendments? What type of solder has been used?	The 1986 Safe Drinking Water Act Amendments banned plumbing components that contained elevated levels of lead. The Reduction of Lead in Drinking Water Act further reduces lead in pipes, pipe fittings, plumbing fittings, and fixtures to a weighted average of 0.25 percent. The Act also redefines "lead-free" under the SDWA to mean: not containing more than 0.2 percent lead when used with respect to solder and flux and not more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures. These provisions went into effect in January 2014. In some areas of the country, it is possible that high-lead materials were used until 1988 or perhaps even later. The local plumbing code authority or building inspector may be able to provide guidance regarding when high-lead materials were last used on a regular basis in the area. If "lead-free" materials were not used in new construction and/or plumbing repairs, elevated lead levels can be produced. If the film resulting from passivation does not exist or has not yet adequately formed, any lead that is present is in direct contact with the water.