

Module 5: Conducting Sampling and Interpreting Results

2-Step Sampling at the Tap



Communication Plan: Don't forget to communicate your plans to test your facility, and to prepare for communicating results. Results should be shared regardless of the lead level detected.

2-Step Sampling at the Tap

EPA recommends that schools and child care facilities conduct a 2-step sampling procedure to identify if there is lead in the outlet (e.g., faucet, fixture, or water fountain) or behind the wall (e.g., in the interior plumbing). These samples should be taken after an 8 to 18-hour stagnation period.

Please note that this section contains recommendations that are generalized for typical plumbing configurations. The [Detailed Fixture Evaluation](#) contains details on types of fixtures and targeted sampling.



STEP 1

250-mL First Draw Sample

Take a 250mL first draw sample at all taps used for consumption to identify potential lead in the fixture.

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.

These samples can be taken in the same sampling event, which can reduce cost, and provide you with more information on lead levels. If not taking these samples at the same time, and elevated lead levels have been found in Step 1, the water should not be consumed while preparing to take the follow-up flush sample. More information on immediate steps is in [Module 6](#).

Helpful Tip...

For further potential cost savings, you or the lab can collect, preserve, and hold (but not analyze) the second sample at the same time the first sample is collected, then analyze only selected Step 2 samples based on review of the Step 1 results. Most commercial labs will “Hold” samples until the client advises to dispose (at nominal cost) or analyze those samples.

Step 1: Initial First Draw Samples

Take first draw samples from fixtures throughout the building that are used for human consumption. EPA strongly recommends that you collect these samples from all outlets used for drinking or cooking, prioritizing the high-risk outlets (i.e., fixtures that are known to or potentially contain lead and fixtures that are used most frequently). The plumbing profile will help pinpoint those high-risk fixtures and to prioritize sample collection.

Important: schools and child care facilities should not use sample results from one outlet to characterize potential lead exposure from all other outlets in their facility. This approach could miss localized lead problems that would not be identified.

The first draw sample identified in Step 1 is representative of the water that may be consumed at the beginning of the day or after infrequent use. This protocol maximizes the likelihood that the highest concentrations of lead will be found because the first 250-mL sample is collected after overnight stagnation (the water sat in the pipes for at least 8 hours).

Procedures for initial outlet samples are shown below:

- All samples should be collected before the facility opens and before the fixtures have been used (EPA recommends an 8 to 18-hour stagnation period).
- One 250-mL sample should be taken at each fixture. Note this is a first-draw sample. Therefore, collect the sample immediately after opening the faucet or valve.
- Compare all sample results to prioritize follow-up sampling and remediation. Outlets with elevated lead levels should not be made available for consumption.



STEP 1

250-mL First Draw Sample

Take a 250mL first draw sample at all taps used for consumption to identify potential lead in the fixture.

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., 1 ppb). 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.

