



New Jersey Department of Environmental Protection

Overview

Lead in Drinking Water at Schools Facilities

The purpose of this document is to provide School Districts (Districts) with the tools necessary to prepare for and carry out a systematic sampling program for lead in drinking water at their facilities necessary to be in compliance with the State Board of Education (BOE) Regulations. For details of the BOE Regulations, including which schools the regulations apply to, please visit [New Jersey Department of Education's website](#). The document was developed using tools from many sources, including the United States Environmental Protection Agency (USEPA).

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1. INTRODUCTION

There are three ways that lead can contaminate drinking water in school facilities, the water source, the plumbing material, or the actual drinking water outlet fixture. Most sources of drinking water (e.g. ground and surface water) have no lead, or very low levels of lead (i.e., under 5 micrograms per liter [$\mu\text{g}/\text{l}$] or parts per billion [ppb]). Once the drinking water leaves the public water supply system or treatment plant, it comes into contact with piping and plumbing materials that may contain lead. Some lead may get into the water from the distribution system – the network of pipes that carry the water to homes, businesses, and schools in the community. Some communities have lead components in their distribution systems, such as lead joints in cast iron mains, service connections, pigtails, and goosenecks. Even though a public water supplier may deliver water that meets all Federal and State public health standards for lead, there may be lead in the drinking water because of the plumbing in the school facility. Interior plumbing, soldered joints, leaded brass fittings, and various drinking water outlets that contain lead materials are the primary contributors of lead in drinking water. It is also important to note that brass plumbing components contain lead.

Since 1986, all plumbing materials must be “lead free”. Although there is an increased probability that a given plumbing component installed prior to 1986 could contain more lead than the newer components, the occurrence of lead in drinking water cannot be predicted solely based upon the age of the component or the school facility. The current law allows plumbing materials up to 0.25 percent lead to be labeled as “lead free”. However, prior to January 4, 2014, “lead free” allowed up to 8 percent lead content of the wetted surfaces of plumbing products including those labeled National Sanitation Foundation (NSF) certified.

The best way to determine if a school might have elevated levels of lead in its drinking water is by testing the drinking water in that school. Testing facilitates an evaluation of the plumbing materials and helps target appropriate remedial action. It is a key step in understanding the problem, if there is one, and designing an appropriate response.

2. GENERAL OVERVIEW OF THE PROCESS

Before a District moves forward with testing, the following steps must be completed. These steps are further explained in the following sections of this document.

- Establish Partnerships and Roles
 - Choose appropriate school staff to function as key team members.
 - Select a Laboratory for Analysis: A NJ certified laboratory must conduct the analysis. For a list of NJ certified labs call the NJDEP Office of Quality Assurance at 609- 292-3950 or view the [list](#) online.
- Develop and sign a [Quality Assurance Project Plan \(QAPP\)](#) for the lead sampling and analysis.
- Create a [School District Lead Sampling Plan](#).
- Develop a Plumbing Profile for the plumbing system at each of your facilities.
- Determine Sampling Locations: At a minimum, all outlets used for drinking and food preparation must be sampled including drinking water fountains and sinks found in concession stands.

3. PLANNING YOUR PROGRAM AND ESTABLISHING PARTNERSHIPS

Monitoring for lead in your school's drinking water is extremely important. You should start by identifying your existing resources, which include school records, available finances, and personnel. You should also research opportunities for assistance from your local public water supplier, State and local health agencies, and certified water testing laboratories.

3.1 Assigning Roles

Your District should assign responsibility to a key individual(s) to ensure that testing and follow-up actions are completed consistently and in accordance to the guidance. A person should also be appointed to serve as the liaison for communication with interested parties (e.g. civic groups, the media, etc.). One person or more may be involved in these activities, but it is important to clearly define responsibilities and to support those people in their roles. An effective program will require a team effort. Sampling Team members may consist of a School District Program Manager, School Project Manager, Individual Project Officer(s), Certified Laboratory, and if applicable, a third-party firm.

If your District decides to use consultants, their roles should be defined with respect to the responsible person(s) at the school (See 4.3 below). Contact your State drinking water program (NJDEP 609-292-7219) or local health department if you need advice on how to identify a qualified consultant.

Additionally, the role of the certified laboratory should be defined, including their responsibilities.

4. DEVELOPMENT OF A QUALITY ASSURANCE PROJECT PLAN (QAPP) AND SCHOOL DISTRICT LEAD SAMPLING PLAN (SAMPLING PLAN)

4.1 Quality Assurance Project Plan (QAPP)

A Quality Assurance Project Plan (QAPP) is a document that describes the planning, implementation and evaluation steps involved in the acquisition of data that will be used to arrive at a specific goal. The overall objective for this QAPP is to determine the lead concentration at drinking water outlets within the District's schools so that corrective action(s) may be implemented at any drinking water outlets found to exceed the USEPA drinking water lead action level of 15 micrograms per liter ($\mu\text{g}/\text{L}$). For the purposes of compliance, any concentration greater than 15 $\mu\text{g}/\text{L}$ (as defined as greater than or equal to 15.5 $\mu\text{g}/\text{L}$) is considered to exceed the lead action level.

The QAPP will be consistently applied by those involved in a School District Lead Sampling Plan (Sampling Plan), including but not limited to District personnel, NJ certified laboratories, and consulting firms. Following the actions specified in this QAPP will provide a high level of confidence in the results of this, and future rounds of sampling. The School District Program Manager, School Project Manager, Individual School Project Officer, Certified Laboratory Manager, Laboratory QA Officer and third-party firm representatives (if the District contract(s) with consulting firms to perform the sampling) are all parties to the QAPP and are required to sign-off prior to initiating any sampling.

4.2 Lead Drinking Water Testing Sampling Plan (Sampling Plan)

Testing for lead in schools requires a coordinated effort especially when multiple schools are to be included in the testing effort. Designated personnel and set protocols are essential to ensuring a coordinated effort. This Sampling Plan is developed to outline goals and responsibilities for sampling lead at a school's drinking water outlets used for consumption and food preparation.

The Sampling Plan contains the tools necessary to prepare for and carry out a complete and comprehensive lead sampling program. It should provide details needed to ensure that representative samples are collected, handled, analyzed, and reported in a manner that meets the needs and objectives of the District. Implementing a clearly defined and consistently employed sampling protocol reduces the chance of sampling error and inaccurate results.

4.3 Who Should Create the Sampling Plan? - Leadership in Sampling

As discussed in Section 3, it is important to designate a school employee(s) to be responsible for the implementation of the sampling program and follow-up activities. If someone else is hired to conduct testing, that person must work with the rest of the Sampling Team to create a Sampling Plan for the District. If laboratory representatives or consultants will be conducting testing, it should be verified that they have experience conducting lead testing at schools. You may wish to ask the laboratory or consultant for references.

4.4 Create A Sampling Plan

Before collecting samples a Sampling Plan must be created. At a minimum, the plan should include:

- A list of all the schools in the District and the priority by which they will be sampled (e.g. schools with younger children will be sampled first, or the older constructed schools will be sampled first);
- A Drinking Water Outlet Inventory for each school facility, including:
 - A list of all sites used for drinking water and food preparation,
 - Unique Sample Location ID for each sampling outlet (e.g. George Washington School with a drinking water fountain on the 2nd floor outside of room 9 could be given the Sample Location ID= GWS-DW-2FL-RM9) and the key code to decipher the unique Sample Location ID (e.g DW means Drinking Water Fountain);
 - On-site assessment of each drinking water outlet, including if it is operational, if there are signs of corrosion (e.g. leaking or rust), if it contains brass, the make and model of water coolers to compare to EPA's Recall List.
 - A [Drinking Water Outlet Inventory form](#).
- A floor plan for each school facility identifying all sampling locations, the point of entry, the water main, and the flow of water through the building.
- Explanation of how water usage in the school facilities will be prohibited for at least 8 hours but no more than 48 hours;
- A Chain of Custody Form that includes:
 - The name and description of the sample collector
 - Sample Location ID
 - Description of sample collection (e.g. initial, flush)
 - Time and Date of the Sample Collection
 - Field notes (e.g. outlet leaking, not turned on etc.)
- A list of all filters installed at each school facility (including the locations of use, manufacturer, make, model, installation date, frequency of replacement, if it removes lead and if it is NSF certified). It is recommended to use the [Filter Inventory form](#).

- A Plumbing Profile for each school facility as described below; and
- A [Flushing Log](#) (if applicable) for each school facility, including the date, time, duration of flushing, and outlet flushed.

The Sampling Plan shall be shared with all parties involved in conducting the sampling.

5. DEVELOPMENT OF A PLUMBING PROFILE FOR YOUR FACILITY'S EXISTING PLUMBING INFRASTRUCTURE

Before sampling and correcting lead problems (if applicable), it is important to assess the factors that can contribute to lead contamination and the extent to which contamination might occur in your facility. You can best accomplish these objectives by developing a plumbing profile of your facility. If your facility has additions, wings, or multiple buildings built during different years, a separate plumbing profile is required for each. A plumbing profile can be created by answering a series of questions about your facility's plumbing and conducting a Walk Through of the facility to confirm plumbing information. Every school is unique and a plumbing profile will help you understand the potential sources of lead in your facility. Conducting this survey of your facility's plumbing will enable you to:

- Understand how water enters and flows through your building(s).
- Identify and prioritize all drinking water outlets, including but not limited to: drinking fountains (both bubbler and water cooler with a chiller unit), kitchen sinks, classroom combination sinks and drinking fountains, home economics room sinks, teachers' lounge sinks, nurse's office sinks, sinks in special education classrooms, and any other sink known to be or visibly used for consumption (e.g., coffeemaker or cups are nearby).
- Understand whether you may have a widespread contamination problem or only localized concerns.
- Plan, establish, and prioritize remedial actions, as necessary.

6. WHERE SHOULD WE SAMPLE? - DETERMINING SAMPLE LOCATIONS

Every water outlet used for drinking or food preparation, including ice machines, must be sampled. You must decide which water outlets are used for consumption and food preparation and the order to sample all the sample sites based on your responses to the plumbing profile and your knowledge of the facility.

Using the information on how cold water flows through the facility from the Plumbing Profile and the Floor Plan, you can determine the order in which the water outlets should be sampled. The drinking water outlet closest to the point of entry, which is where the service line enters the school facility, should be sampled first then following downstream to the next drinking water outlet.

Some sample sites that are most likely to have lead contamination include:

- Areas with lead pipes or lead solder.
- Areas of recent construction and repair in which materials containing lead were used.
- Areas where the plumbing is used to ground electrical circuits.
- Areas of low flow and/or infrequent use.
- Areas containing brass fittings and fixtures.
- Water coolers identified by USEPA as having lead-lined storage tanks or lead parts. (If identified these should be removed.)

7. LEAD SAMPLING – WHO, WHERE AND HOW?

7.1 Who Can Collect a Sample?

- A representative from a NJ certified laboratory;
- Employee of the District; or
- Representative of the District (consultant).

Establish that the sampler is adequately trained to collect samples to avoid errors.

7.2 Who Should Do the Analysis?

- Analysis **must** be conducted by a NJ certified lab.
- A [list](#) of labs certified to test for lead in New Jersey drinking water.

7.3 How to Conduct the Sampling

USEPA recommends that a two-step sampling process be followed for identifying lead contamination. Lead in a water sample taken from an outlet can originate from the outlet fixture (e.g. the faucet, bubbler etc.), plumbing upstream of the outlet fixture (e.g. pipe, joints, valves, fittings etc.), or it can already be in the water that is entering the facility. The two-step sampling process helps identify the actual source(s) of lead.

In Step 1, initial first draw samples are collected to identify the location of outlets providing water with elevated lead levels. In Step 2, follow-up flush samples are taken from outlets identified as problem locations to determine the lead level of water that has been stagnant in upstream plumbing, but not in the outlet fixture. Sample results are then compared to assist in determining the sources of lead contamination and the appropriate corrective measures.

NOTE

Sample Cold Water Outlets:

- Samples should only be collected from the cold water faucet.
- For metered or motion sensor faucets, the hot water valve needs to be closed prior to sampling.

Ensure that outlets deviating from normal usage are flushed 8-48 hours prior to sampling. If a school wide systematic flushing is required, it should be done 48 hours prior to the sampling event. Additionally, a [special procedure](#) is necessary to sample ice machines.

Step 1: Initial First Draw Sampling

- Initial first draw samples are taken from drinking water outlets and food preparation outlets (e.g., bubblers, kitchen faucets) in the facility. These samples determine the lead content of water sitting in water outlets that are used for drinking or cooking within your building(s).
- OPTIONAL: A sample can be collected from a tap located as near as possible to the service line (i.e., the pipe connecting your facility to a larger water main) to learn the level of the lead in the water entering the facility.

Step 2: Follow-Up Flush Sampling

- If initial first draw test results reveal lead concentrations greater than 15 µg/l (ppb) in a 250 mL sample for a given outlet, follow-up flush testing is required to determine if the lead contamination results are from the fixture or from interior plumbing.
- Follow-up flush samples are collected and analyzed to pinpoint where (i.e., fixtures or interior plumbing) lead is getting into drinking water so that appropriate corrective measures can be taken.
- As with initial first draw samples, follow-up flush samples are to be taken before a facility opens and before any water is used. Follow-up flush samples at drinking water outlets, except water coolers with chiller units, are collected after the water has run for 30 seconds. This sampling approach is designed to analyze the lead content in the water in the plumbing behind the wall. Follow-up flush samples at water coolers with chiller units are collected after the water has flushed for 15 minutes. This sampling procedure is designed to allow the water cooler's reservoir to be emptied and the lead content in the water in the plumbing connecting to the water cooler to be analyzed.

Districts may wish to collect both initial and follow-up samples at the same time. This is more convenient and may save time and money; however, using this approach creates a trade-off between convenience and confidence. The confidence in the sample results will decrease since flushing water through an outlet immediately after taking the initial sample could compromise the flushed locations depending on the interior plumbing of buildings. Protocols for both options are provided in the [Sampling Plan Template](#). Districts can decide which option works best for their situation.

More detailed sampling guidance is available in the [Quick Reference Guide: Sampling for Lead in Drinking Water in Schools](#).

8. RESULTS

The laboratories will provide the lead sample results to the District in an electronic format within the timeframe required under the contract. A spreadsheet of all results, the analytical results report, and the chain of custody forms must be included. These requirements are detailed in the [QAPP](#).

The District will review and verify the final laboratory results and within 24 hours of this review shall make the test results of all water samples publicly available at the school facility(ies) and on the District's website.

If any results exceed the lead action level, the District shall provide written notification to the parents/guardians of all students attending the facility, as well as the Department of Education (DOE). The notification shall include the following:

- a description of the measures taken by the District to immediately end use of each drinking water outlet where the water quality exceeds the permissible lead action level;
- if necessary, the measures taken to ensure that alternate drinking water has been made available to all students and staff members; and
- information regarding the health effects of lead.

9. INVESTIGATION AND REMEDIATION

All data, plumbing profile information, Drinking Water Outlet Inventory information, including the Filter Inventory information, and the Chain of Custody observations should be reviewed to determine the appropriate remedial measures. NJDEP has developed a [Flow Chart](#) to assist schools with remedial measures. It is helpful to develop a Short-term Remedial Action Plan that details short-term immediate actions that should be implemented if the results exceed the action level. For example:

<i>For sample sites with Initial First Draw Sample results over 15ppb</i>	
IMMEDIATE ACTIONS	
✓	Shut off all water outlets (e.g. fountains, sinks) used for drinking.
✓	Provide alternate drinking water (e.g. bottled water), as necessary.
✓	Post “Do Not Drink- Safe for Handwashing Only” notice at faucets that are used for purposes other than drinking and food preparation (e.g. handwashing).
✓	Inform the public as described in the Board of Education Regulations.

Some remedial measures are described in detail in Section 5 of [USEPA’s guidance document “3Ts for Reducing Lead in Drinking Water in Schools” \(2006 Revision\)](#).

10. FOLLOW UP (LONG-TERM SOLUTIONS)

If a remedial measure, such as flushing or treatment, is installed, schools should:

- Develop and adhere to an Operation and Maintenance Plan that includes periodic inspection/maintenance of the treatment and/or flushing equipment.
- Maintain a service agreement for maintenance and repair of installed treatment units.
- Develop a regular testing schedule to ensure that treatment continues to be effective.

For further guidance on selecting long term remediation see [Guidance for Schools Selecting a Water Treatment System for Removal of Lead](#)

11. COMMUNICATION

In addition to testing for lead and remediating any contamination problems, a lead control program should also include a public information component. Districts should be aware of who is included in their community, for example, students, students’ parents/guardians, and all staff members. Districts should be transparent with their community throughout the entire process and communicate in multiple languages as necessary. Notification should be made to the community prior to the lead testing event to inform when sampling will take place and what the Sampling Plan entails. Additional notification should be made upon receipt of the analytical results advising of the results and what actions, if any, were taken to remediate elevated lead levels.

Per the BOE regulations, within 24 hours of receiving and reviewing the results, Districts are required to make the sampling results available on the District’s website and at the school facility for inspection by the public, including parents, staff, students, etc.

There are six public notification methods that can be applied alone or in combination to communicate information about a lead control program:

- Letters and Fliers

- Mailbox and Paycheck Stuffers
- Email and Websites
- Staff Newsletter
- Press Release
- Presentations

Reminder: If a drinking water outlet sample exceeds the lead action level, a written notification is required to be provided to the school community (i.e. parents, staff, students, etc.).

References

The following documents, resources, and references are available on the NJDEP, Division of Water Supply and Geoscience's [website](#).

- School District Lead Sampling Plan Template
- Lead Sampling Plan Toolkit
- Quality Assurance Project Plan (QAPP) Template
- NJ Certified Laboratories for Lead in Drinking Water
- Public Notice Letter Templates
 - Announcement Letter Template
 - Results Letter Template
- Example Completed School Package
- Sampling Quick Reference Guide
- Frequently Asked Questions