Vermont Lead in School Drinking Water Testing Pilot Report

VERMONT

AGENCY OF NATURAL RESOURCES
DEPARTMENT OF HEALTH

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Table of Contents

List of Figures and Tables

Executive Summary

In 2017, the Vermont Department of Health, Agency of Natural Resources, and the Agency of Education established a collaborative pilot to 1), build the State's capacity to support schools that test their drinking water for lead, and 2), gain insight into how prevalent elevated lead levels in drinking water may be in Vermont schools.

A set of 16 schools contacted for the pilot agreed to test for lead in water from every tap used for drinking or cooking. Participating schools were from every part of the state. All schools had kindergarten or pre-K classrooms on site and were served by a municipal water supply system.

Water from nearly 900 taps was tested. Lead was detected (greater than 1 ppb (parts per billion)) in the drinking water of at least three taps in all schools, and elevated lead levels (greater than or equal to 15 ppb) were found at one or more taps in five schools. Each school quickly removed taps with elevated lead levels from service for drinking water use and worked with the State to find the best possible solutions to lower lead levels (e.g. replacing plumbing fixtures).

Twenty-seven taps had lead levels greater than or equal to 15 ppb. Plumbing fixtures were determined to be the source of elevated lead levels in the drinking water. Plumbing fixtures were replaced for 11 of these taps and the remaining 16 plumbing fixtures were permanently taken out of service.

As a result of the pilot, 19 additional schools have expressed interest in testing school drinking water for lead using their own resources. Six of these schools have already completed testing on their own using the same protocols established for the pilot.

Further testing of lead in school drinking water for all schools is recommended. Because there is no safe level of lead in the body, action should be taken to ensure lead levels in drinking water are as low as possible. Many of the solutions to fixing a lead in drinking water problem are easy and low cost. Permanent solutions are recommended including plumbing fixture replacement, removal of redundant or seldom-used fixtures, and encouraging the use of centrally located, well-maintained bottle fill stations.

Acknowledgement

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Introduction

Schools are responsible for ensuring the health and safety of the children entrusted to their care. Providing access to safe drinking water is a fundamental part of this responsibility. Observing that several states had recently implemented requirements for schools to test drinking water for lead, the Vermont Department of Health, Agency of Natural Resources, and the Agency of Education set up a pilot to test drinking water for lead in 16 schools.

The aim of the pilot was to 1), build the State's capacity to support schools that test their drinking water for lead, and 2), gain insight into how prevalent elevated lead levels in drinking water may be in Vermont schools. Schools received the following:

- School-specific plumbing profiles and sampling plans
- Letter templates to help schools notify parents/guardians, teachers and staff about the program and results of the testing
- Training on sample collection
- Test kits and sample analysis
- Transport of samples to the Health Department Laboratory
- Technical assistance regarding result interpretation and remediation strategies

Schools removed taps with elevated lead levels from service and worked with the State to find the best possible solutions to lower lead levels (e.g. replacing plumbing fixtures).

Background

Lead is a toxic metal that is harmful to human health. Lead can harm anyone, but children under the age of 6 are at special risk. Children are most susceptible to the effects of lead because their bodies are still developing, and they absorb lead more easily than adults do. Lead can affect children's development in many ways, but it can cause particular harm to the central nervous system (brain).

There is no safe level of lead in the body. Even low blood lead levels in a child's body can slow growth, make it hard to learn, and cause behavior problems. Most children who have lead poisoning or high levels of lead exposure do not look or act sick. The amount of lead in a child's body depends on several factors—including their exposure to lead, their age, their nutritional status, and other factors.

Lead in drinking water has received increased national attention following the widespread drinking water contamination found in Flint, Michigan in 2015. Twenty states across the country have initiated, or are in the process of initiating, programs for testing lead in school drinking water. In our region, Massachusetts initiated a voluntary program to test water in schools for lead, and New Hampshire and New York passed legislation requiring schools to test for lead in drinking water.

Lead may still be present in a school's drinking water, in spite of several legislative and regulatory efforts to remove lead from drinking water on both the state and federal level. Lead can get into drinking water as water moves through older lead pipes, plumbing fixtures or solder that contain varying levels of lead. The age of the school's plumbing and plumbing fixtures is an important factor. Until around the 1950s, lead pipes were used for some service lines and connections that carry water from street mains to buildings. Lead-based solder containing as much as 50% lead was used to join standard copper water pipes until it was outlawed in 1988. However, lead solder could still be legally made up of 8% lead. In 2010, Vermont became one of the first states to further reduce the amount of lead in plumbing fixtures from 8% to 0.25%, and to 0.2% in solder and flux. Non-compliant plumbing fixtures and supplies cannot be sold or installed in Vermont as of 2010.

Many Vermont schools are in older buildings, which means they are more likely to have lead in their plumbing and plumbing fixtures. School construction aid that may have helped schools replace plumbing components or fixtures in the past has not been available since 2007. Water that sits in lead pipes and plumbing fixtures for longer periods of time will contain higher levels of lead. As a result, lead levels in a school's drinking water may be particularly high after weekends and vacations, or from plumbing fixtures that are used infrequently. Schools also provide a unique case in that they have multiple faucets, fountains, and other ways drinking water is provided.

In 2017, 480 children under 6 years old were poisoned by lead in Vermont. While the effects of lead poisoning are irreversible, it is entirely preventable. Vermont already has initiatives in place to test for lead in drinking water at child care facilities and in homes.

Currently, only a subset of schools is routinely tested for lead in drinking water. Two things determine whether schools are required to test for lead: 1), where their water comes from, and 2), how many people are served. Schools fall into the following groups:

- **Schools that are on their own well and serve 25 people or more** – Federal and state regulations consider these schools to be public water systems. As a public water system, they are required to test water for lead from some of their taps on a regular basis like all public water systems. Not all taps are required to be tested. The number of taps sampled is based on the number of people served. The results of these tests are available on the Agency of Natural Resources Drinking Water Watch Database.
- **Schools that get their water from a public water system (town, city or other)** – Many schools get their water from a municipal public water system. As described above, these public water systems are required to test for lead on a regular basis. However, samples are taken from private homes because federal laws prioritize testing at single family homes, not at schools. Lead can still get into the drinking water from older pipes, plumbing fixtures or solder within the school building even though the water supplied to

a school from a public water system may have been tested and shown to have acceptably low levels of lead elsewhere in the system.

- **Schools that are on their own well and serve fewer than 25 people** – A school is not required to test its water for lead if it has its own well and serves fewer than 25 people, because it does not fall under public water system regulations.

Schools throughout the U.S. have found elevated lead (greater than or equal to 15 ppb) levels in their schools. The majority of the 1,000 schools tested to date in Massachusetts had elevated lead levels, 83% of schools in New York City had at least one tap with elevated lead results, and 66% of Denver (Colorado) public schools tested had elevated lead levels—the majority of which were built between 1950 and 1960.

Methodology

An effort was made to include schools from across Vermont, rather than focusing on one county or region. These factors were considered when choosing schools to participate:

- Socio-economic factors
- Size of the student body
- If the facility hosts a pre-K program
- If the school is on a public water supply
- If corrosion control is used at the public drinking water treatment facility
- Rates of elevated blood lead levels in the community

A number of services and resources were provided to schools that participated in the program, including:

- Development of school specific plumbing profiles and sampling plans
- Letter templates to help schools notify parents/guardians, teachers and staff about the program and results of the testing
- Training on sample collection, purchase of sampling materials and sample analysis
- Assistance with interpreting results and selecting remediation strategies

The testing protocol used in this pilot was based on the Environmental Protection Agency's *3Ts for Reducing Lead in Drinking Water in Schools* guide. This manual is intended to help school officials minimize student and staff exposure to lead in drinking water by training, testing and telling.

The number of samples collected depended on the size of the school and the number of taps used to provide water for drinking or cooking. Testing each tap used for drinking or cooking is the only way to identify potential sources of lead. Some taps did not need to be sampled. These taps included: eye wash stations, emergency showers, tub fillers, outside hose spigots (unless

used to fill water coolers or bottles), shower heads, soak tubs, toilets, furnace drain valves, fire sprinklers, janitorial slop sinks, and any other water tap not used for drinking or cooking purposes.

The sampling process is simple and did not require in-depth knowledge or training. A first draw sample was taken at each tap and a flush sample was taken at most taps. The first draw sample collects the first water that comes out of the tap after a period of inactivity, typically between eight and 18 hours. The flush sample collects water after the tap has been running for 30 seconds. The flush sample helps determine where lead may be coming from (i.e. plumbing fixtures vs. pipes). If the flushed sample yields a high lead result, then it likely means the lead is coming from the pipes and/or solder. A high lead result in a first draw sample indicates that plumbing fixtures are the likely source of lead.

The schools were supplied with sample bottles and laboratory analyses were provided at no cost to the schools. The samples were collected in 250-mL (milliliter) bottles. This volume is similar to the amount of water a child would consume out of a water tap.

A school designee(s) used the sample bottles to collect water from each tap and filled out the sampling form with information such as the location of the tap, the time and date of collection, and whether it was a first draw or flush sample. The samples were then delivered to the Health Department Laboratory, which is a certified drinking water lab, for analysis.

Analysis took about two to four weeks to complete after the laboratory received the samples. Each school was sent a report outlining recommendations and next steps for remediation after the analysis was completed. Schools were encouraged to notify parents/guardians, teachers and staff of the test results in writing as soon as possible. Letter templates were provided. Results were sent to the school principal, school board chair, superintendent, facility manager, and the water system operator. Results were also posted at www.healthvermont.gov/school-drinking-water.

Any lead levels found to be at or above 15 ppb were immediately addressed. Schools immediately stopped using the tap for cooking or drinking by turning off water supplied to the tap or installing signage with pictures that instructed “for handwashing only, do not drink.” Schools were encouraged to do another test after the problem was fixed to ensure that the water was safe before using the tap again for cooking or drinking. This follow-up sampling for lead took place at no cost to the school.

Drinking water experts worked with schools to find the best possible solution to lower lead levels. Many solutions were easy and low-cost (e.g. cleaning debris from screens, removing the tap from use, replacing plumbing fixtures, or implementing a flushing program). Since there is no safe level of lead in the body, schools were encouraged to take action to reduce the level of

lead in drinking water wherever it was detected (even below 15 ppb). Many of the same easy, low-cost fixes can be used to reduce detected lead levels.

Findings

School staff were responsive and followed recommendations for notification and remediation. Schools that participated notified parents/guardians and staff both prior to sampling and after receiving results. Most schools used the sample letters provided to communicate with their school community.

When elevated lead levels were found, school administrators and facility managers took immediate action to remove the taps from service. Some of these taps were already rarely used and/or had flow problems. When lead was detected below 15 ppb, school administrators and facility managers took actions to reduce lead levels, such as implementing new policies on flushing taps and encouraging use of existing bottle fill stations. Long-term actions included removing and/or replacing old plumbing fixtures. Remediation costs for schools typically ranged from less than $100 up to $500 for fixture removal or replacement. Only one school reported remediation action costs above $500 where a bottle fill station was installed.

The amount of school staff time required varied by school.
For most schools, sample collection was completed by one designee. Smaller schools took one to two hours to collect their samples, while larger schools took three to six hours. Some schools noted changes that could be made to reduce the amount of time required to complete sampling forms.

Lead was detected at levels that exceed the recommendations of the American Academy of Pediatrics in every school tested.
Five of the 16 schools that participated in this pilot had at least one tap with a lead result at or above 15 ppb. Because there is no safe level of lead in the body, a Vermont Health Advisory Level of 1 ppb has been established. This is consistent with the American Academy of Pediatrics recommendation that taps in schools should not exceed water lead concentrations of more than 1 ppb. More than 17% of the total samples collected had a lead result greater than 1 ppb. All 16 schools had at least three taps where lead was detected above 1 ppb. Full result summaries can be found in Appendix A.

The common source of lead in drinking water in Vermont schools tested was plumbing fixtures.
In most cases where lead was found above 15 ppb, the plumbing fixture was determined to be the source of lead. Replacing the plumbing fixtures is expected to reduce lead levels in drinking water. Follow-up testing is being conducted to confirm lead levels in drinking water are reduced after plumbing fixture replacement.

Lead was not detected in bottle fill stations equipped with appropriate filters.
Bottle fill stations equipped with appropriate filters that were changed at intervals recommended by the manufacturers had levels of lead less than 1 ppb. These stations meet the modern lead-free requirements and are equipped with filters that are certified to remove lead. In several cases during the pilot, schools were able to maintain access to safe drinking water by directing students and staff to use existing bottle fill stations rather than water from other taps.

State capacity is limited.
Subsequent schools that test for lead in drinking water will benefit from the materials and guidance that were developed for this pilot. However, the State would not have the capacity to visit each school, develop a plumbing profile and a sampling plan, or pay for the analysis and transport of water samples. Now that the pilot has ended, these tasks and costs would fall to school staff. Drinking water experts will have limited availability to help troubleshoot elevated lead results and to help identify the most effective means to reduce lead concentrations in drinking water. If a requirement for lead in drinking water testing were placed on schools, additional resources would be needed to provide support and technical assistance. Schools that test on their own outside of this pilot can expect the cost per sample to be $12 plus the cost of shipping.

Laboratory capacity does not appear to be limited.
The Health Department Laboratory was able to process as many as 300 samples per week during the pilot to accommodate sampling from larger schools. The Health Department Laboratory recently purchased additional equipment to increase surge capacity in the event additional schools are tested. If school samples are not able to be staggered, additional laboratory capacity could be provided by other certified drinking water laboratories, some of which analyzed samples for school lead testing programs in neighboring states.

Policy Recommendations

Conduct further testing of lead in school drinking water for all schools, and take remedial actions to ensure lead levels in drinking water are as low as possible.
Because there is no safe level of lead in the body, a Vermont Health Advisory Level of 1 ppb has been established. All 16 schools that participated discovered opportunities to reduce the level of lead in their school's drinking water. No school was found to have lead levels in all taps at or below the Vermont Health Advisory Level. Lead cannot be seen, tasted or smelled in water. Testing is the only way to know if lead is in drinking water.

It is not yet understood if schools that are on their own well will have similar results to schools that are supplied by a public water system. A similar pilot to test all taps used for drinking or cooking should be conducted in schools that are on their own wells, including those schools that are already testing a subset of their taps under the Vermont Water Supply Rule or Vermont Child Care Licensing Regulations.

Create a database housing all reported school testing results to better understand the extent of the problem statewide.
There is limited data regarding lead in school drinking water in Vermont. The results should be made publicly available, so parents can easily learn about conditions in their children's schools, and as a way of ensuring transparency on this important public health issue. Some schools have already conducted testing on their own, but the State may not have records of their results.

Simplify sampling forms to reduce the amount of paperwork involved in school drinking water testing.
At present, a sampling form must be filled out for each drinking water sample. It would save school staff time if they could fill out one sampling form for each batch of drinking water samples, and provide a smaller amount of information for each sample in spreadsheet format (including the sample number, sample type, sample location, and time of collection).

Best Practice Recommendations

Permanent remediation recommendations include plumbing fixture and/or pipe replacement.
Replacing plumbing fixtures and/or pipes with compliant plumbing fixtures and supplies will reduce lead exposure from drinking water. Under the current law, the costs associated with replacement are borne by the school. Plumbing fixture removal and replacement was frequently recommended to the 16 schools that participated. Flushing plumbing fixtures and pipes for a period of time is a short-term solution to reduce lead levels. Flushing can be used as an interim solution while working to replace older plumbing fixtures and pipes that are the source of lead. Plumbing fixtures and pipes that are replaced or removed from service should be properly disposed of to ensure that they are not reused.

Remove redundant or seldom-used fixtures.
Many schools had sinks and/or drinking water faucets in every classroom. Some rooms even had several sinks within the room, not all of which were used on a regular basis but were available to be used for drinking water at any time. Lead levels in drinking water can increase as the water sits in the pipes and fixtures. While some classrooms, such as those used for early child care, are required to have multiple sinks, removing redundant or seldom-used fixtures will reduce potential exposure to lead in drinking water.

Encourage use of bottle fill stations.
Schools that already have bottle fill stations should encourage their use. Schools that do not have bottle fill stations could replace old classroom and hallway plumbing fixtures by installing centrally located bottle fill stations equipped with appropriate filters. Manufacturer recommendations for maintenance should be followed and logs should be kept to document filter changes.

Flushing is a good practice to implement after weekends, holidays or vacations.
Water that sits in pipes and plumbing fixtures that contain lead when school is not in session may contain higher levels of lead. Taps that were not used regularly and had water sitting in the pipes and plumbing fixtures for extended periods of time had results as high as 25,140 ppb. Regular use and flushing can help to reduce the level of lead in school drinking water.

Adopt a communication strategy.
It is important to be transparent and upfront with the school community about lead in school drinking water testing. Schools should notify parents/guardians, teachers and staff before testing begins. Schools can use the sample notification letters that were developed for the pilot. Samples should not be collected until this notification is made. Once samples are collected and analyzed, results and planned action steps should be shared with parents/guardians, teachers and staff as soon as possible after the school receives the laboratory report. Schools can, again, use the sample notification letters that were developed for the pilot.

Limitations

Water that sits in pipes and plumbing fixtures during weekends and vacations was not tested as part of this pilot. Because the samples collected as part of the pilot were not taken after weekends or vacations, these results should not be interpreted to indicate that the water that sits in pipes and plumbing fixtures during these low-use times meets recommended levels.

No lead service lines were found to be serving the 16 schools, but it is unknown whether other schools in Vermont are served by lead service lines.

The results reported only capture a snapshot in time for the 16 schools that were tested. Results may vary because of tap use, plumbing maintenance practices, age of a school's plumbing, and changes in the water supplied by a municipal public water system.

Conclusion

While a major source of lead poisoning in Vermont children is paint, lead in plumbing pipes and plumbing fixtures can add to their overall lead exposure. Since many Vermont schools are in older buildings, they are more likely to have lead in their plumbing. Plus, water that sits in pipes and plumbing fixtures when school is not in session may contain higher levels of lead. The only way to know if lead is in drinking water is to test for it. Schools should be encouraged to share their testing results and what the costs of mitigation were with the State. In this way, our understanding of the extent of the issue and its financial implications can continue to be used to improve and inform technical support provided to schools.

Appendices

Appendix A: Summary of Results

Table 1. Sampling result summary and total number of taps tested and samples taken

School	City/Town	≤ 1 ppb	> 1 ppb & < 15 ppb	≥ 15ppb	Total Samples	Total Taps
Academy School	Brattleboro	61	20	1	82	49
Barre City Elementary & Middle School	Barre	236	11	3	250	156
Bennington Elementary School	Bennington	71	4	0	75	40
Cabot School	Cabot	25	22	0	47	29
Castleton Elementary School	Castleton	46	42	9	97	60
Central Elementary School	Bellows Falls	34	4	0	38	19
Elm Hill School	Springfield	48	20	0	68	43
Enosburg Elementary School	Enosburg	27	37	0	64	41
Johnson Elementary School	Johnson	75	6	0	81	51
Ludlow Elementary School	Ludlow	13	6	0	19	11
Northwest Primary School	Rutland	38	6	0	44	29
Richford Elementary School	Richford	11	19	15	45	26
St. Albans City School	St. Albans	179	6	1	186	114
St. Johnsbury School	St. Johnsbury	196	11	0	207	133
Thatcher Brook Primary School	Waterbury	108	3	0	111	72
White River School	White River Junction	31	6	0	37	24
Totals		**1199**	**223**	**29**	**1451**	**897**

Figure 1. Percent of total samples with lead levels in parts per billion (ppb)

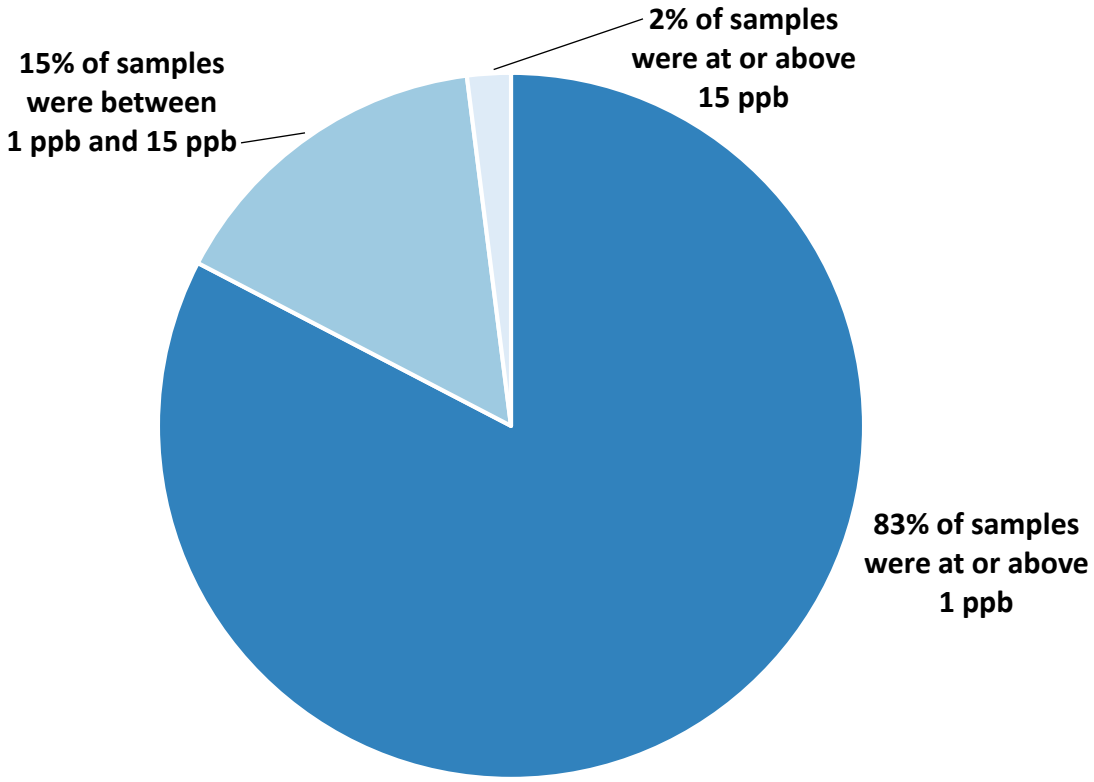

Table 2. First draw sample results

School	City/Town	≤ 1 ppb	> 1 ppb & < 15 ppb	≥ 15ppb	Total First Draw Samples
Academy School	Brattleboro	28	20	1	49
Barre City Elementary & Middle School	Barre	149	5	2	156
Bennington Elementary School	Bennington	35	4	0	39
Cabot School	Cabot	10	19	0	29
Castleton Elementary School	Castleton	15	39	9	60
Central Elementary School	Bellows Falls	15	4	0	19
Elm Hill School	Springfield	23	20	0	43
Enosburg Elementary School	Enosburg	5	36	0	41
Johnson Elementary School	Johnson	46	5	0	51
Ludlow Elementary School	Ludlow	7	4	0	11
Northwest Primary School	Rutland	23	6	0	29
Richford Elementary School	Richford	5	7	14	26
St. Albans City School	St. Albans	105	5	1	114
St. Johnsbury School	St. Johnsbury	121	11	0	132
Thatcher Brook Primary School	Waterbury	70	2	0	72
White River School	White River Junction	18	6	0	29
Totals		**678**	**190**	**27**	**895**

Figure 2. Percent of first draw samples with lead levels in parts per billion (ppb)

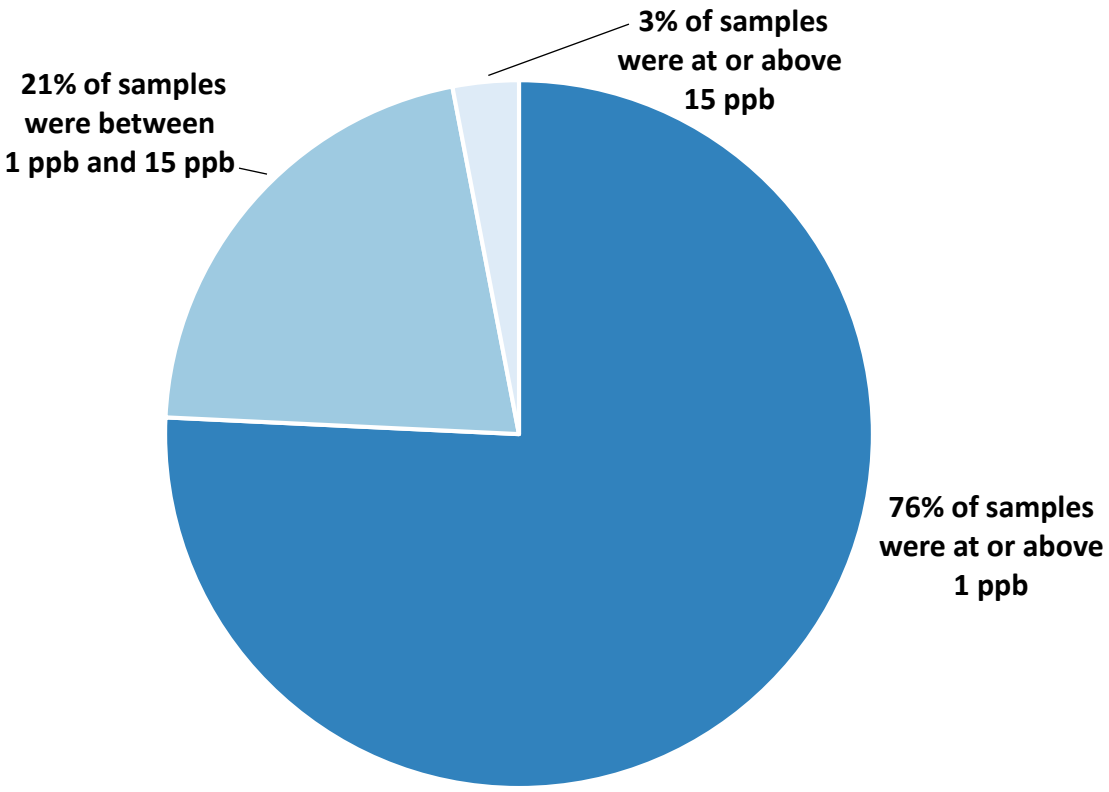

Table 3. Flush sample results

School	City/Town	≤ 1 ppb	> 1 ppb & < 15 ppb	≥ 15ppb	Total Flush Samples
Academy School	Brattleboro	33	0	0	33
Barre City Elementary & Middle School	Barre	87	6	1	94
Bennington Elementary School	Bennington	36	0	0	36
Cabot School	Cabot	15	3	0	18
Castleton Elementary School	Castleton	31	6	0	37
Central Elementary School	Bellows Falls	19	0	0	19
Elm Hill School	Springfield	25	0	0	25
Enosburg Elementary School	Enosburg	22	1	0	23
Johnson Elementary School	Johnson	29	1	0	30
Ludlow Elementary School	Ludlow	6	2	0	8
Northwest Primary School	Rutland	15	0	0	15
Richford Elementary School	Richford	6	12	1	19
St. Albans City School	St. Albans	71	1	0	72
St. Johnsbury School	St. Johnsbury	75	0	0	75
Thatcher Brook Primary School	Waterbury	38	1	0	39
White River School	White River Junction	13	0	0	13
Totals		**521**	**33**	**2**	**556**

Figure 3. Percent of flush samples with lead levels in parts per billion (ppb)

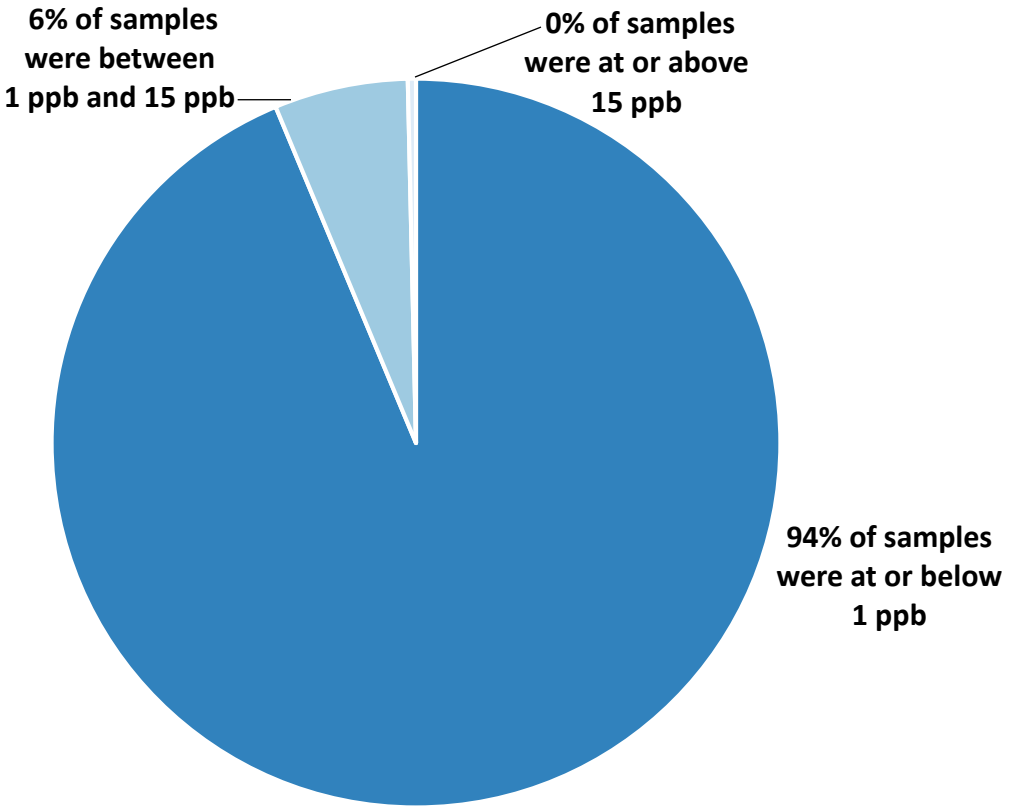

Table 4. Types of fixtures and number of taps sampled

Fixture Type	Number of Taps
Classroom Faucet	403
Classroom Fountain	277
Bottle Fill Station	84
Water Cooler	32
Fountain	17
Kitchen Faucet/Kettle	39
Staff Room Faucet	20
Nurse's Office Faucet	7
Other	18

Appendix B: Sample Notification Letter

Dear Parents/Guardians and Staff:

In order to take a proactive approach to health and safety, our school is planning to test for lead in school drinking water.

Lead rarely occurs naturally in water supplies, and the public water supply we are on is regularly tested. However, drinking water can become a source of lead exposure if a building's plumbing or fixtures contain lead.

In the coming weeks, we will collect water samples throughout the school and send them to a certified drinking water laboratory to be analyzed for lead.

How long will it take to get the results?

We expect results to be available 2-4 weeks after water samples are collected and sent to the certified drinking water laboratory for analysis. We will send a summary of the results to parents/guardians and staff immediately upon receipt of the laboratory's report.

What will happen if there is lead in the drinking water at the school?

Any tap with a lead level at or above the Environmental Protection Agency's action level for public drinking water of 15 parts per billion (ppb) will be taken out of service immediately. When a fix is implemented, and follow-up testing indicates levels are below the action level or, ideally, below detection, the tap will be put back in service.

Our school is committed to taking action to reduce lead levels as low as possible. We will work to determine the most effective means of fixing the problem with a progression of corrective actions. There are many easy and low-cost fixes to reduce lead in drinking water. For example, one school that recently tested in Vermont found that they could reduce lead levels by simply running the taps for 30 seconds each morning.

What are the sources of lead exposure?
Exposure to lead is a public health concern in Vermont. Potential sources include dust from deteriorated lead-based paint, toys, keys, jewelry, pottery, dishes, contaminated soil, old plumbing pipes and fixtures, imported candy and foods, and antique, vintage and salvaged goods. While a major source of lead poisoning in Vermont children is paint, lead in plumbing pipes and fixtures can add to a person's overall lead exposure.

To test your own home for lead in drinking water, contact the Health Department Laboratory to order a $12 test kit:

- Call: 802-338-4736 or 800-660-9997 (toll-free in Vermont)
- Fill out an order form: healthvermont.gov/lab/forms

Where can I get more information?
For more information regarding the testing project:

- Call SCHOOL CONTACT at 802-XXX-XXXX
- Visit: LINK TO SCHOOL WEBSITE

To learn more about lead hazards and lead poisoning prevention, contact the Health Department:

- Call: 800-439-8550
- Visit: healthvermont.gov/lead

Sincerely,

SCHOOL OFFICIAL

Appendix C: Plumbing Profile Template

This template is from EPA's 3Ts for Reducing Lead in Drinking Water in Schools.

Appendix D: Sample Tap Inventory (Sampling Plan)

This sampling plan served multiple roles. It was an inventory of the schools drinking and cooking water taps, the order in which samples were to be collected, the type of sample to be collected, and the sample location to be used on the sampling form.

Tap	Location	Fixture Type	Sample Type
1	Kitchen sink	Sink	First Draw
2	Pot filler	Sink	First Draw
3	Kitchen fountain	Water Cooler	First Draw
4	Grade 1 fountain	Fountain	First Draw
5	Grade 1 sink	Sink	First Draw
6	Grade 2 fountain	Fountain	First Draw
7	Grade 2 sink	Sink	First Draw
8	Grade 3 sink	Sink	First Draw
9	Grade 4 sink	Sink	First Draw
10	North hall fountain	Fountain	First Draw
11	Nurse sink	Sink	First Draw
12	South hall fountain	Fountain	First Draw
13	Grade 5 fountain	Fountain	First Draw
14	Grade 5 sink	Sink	First Draw
15	East hall bottle filler	Water Cooler	First Draw
16	East hall fountain	Water Cooler	First Draw
17	Kitchen sink	Sink	30-sec Flush
18	Pot filler	Sink	30-sec Flush
19	Kitchen fountain	Water Cooler	30-sec Flush
20	Grade 1 sink	Sink	30-sec Flush
21	Grade 2 sink	Sink	30-sec Flush
22	Grade 3 sink	Sink	30-sec Flush
23	Grade 4 sink	Sink	30-sec Flush
24	North hall fountain	Fountain	30-sec Flush
25	Nurse sink	Sink	30-sec Flush
26	South hall fountain	Fountain	30-sec Flush
27	Grade 5 sink	Sink	30-sec Flush
28	East hall fountain	Water Cooler	30-sec Flush

Appendix I – Plumbing Profile Questionnaire

This questionnaire is designed to assist with the determination of whether or not lead is likely to be a problem in your facility, and will enable you to prioritize your sampling effort. A separate plumbing profile may be needed for each building, addition, or wing of your facility, especially if the construction took place at different times. Some of the questions in this questionnaire may not apply to your facility for various reasons. Skip those questions that do not apply. For a discussion of this questionnaire and interpretation of possible answers, please see Chapter 3 of the document.

Plumbing Profile Questions	Answers
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.	Answer
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?	Answer
3. When were the most recent plumbing repairs made (note locations)?	Answer
4. With what materials is the service connection (the pipe that carries water to the school from the public water system's main in the street) made? Note the location where the service connection enters the building and connects to the interior plumbing.	Answer

5. Specifically, what are the potable water pipes made of in your facility (note the locations)? • Lead • Plastic • Galvanized Metal • Cast Iron • Copper • Other Note the location of the different types of pipe, if applicable, and the direction of water flow through the building. Note the areas of the building that receive water first, and which areas receive water last.	Answer
6. Do you have tanks in your plumbing system (pressure tanks, gravity storage tanks)? Note the location of any tanks, and any available information about the tank; e.g., manufacturer, date of installation.	Answer
7. Was lead solder used in your plumbing system? Note the locations with lead solder.	Answer
8. Are brass fittings, faucets, or valves used in your drinking water system? (Note: Most faucets are brass on the inside.) You may want to note the locations on a map or diagram of your facility and make extensive notes that would facilitate future analysis of lead sample results.	Answer

9. How many of the following outlets provide water for consumption? Note the locations. • Water Coolers • Bubblers • Ice Makers • Kitchen Taps • Drinking Fountains or Taps	Answer
10. Has your school checked the brands and models of water coolers and compared them to the listing of banned water coolers in Appendix E of this document? Note the locations of any banned coolers.	Answer
11. Do outlets that provide drinking water have accessible screens or aerators? (Standard faucets usually have screens. Many coolers and bubblers also have screens.) Note the locations.	Answer
12. Have these screens been cleaned? Note the locations.	Answer

13. Can you detect signs of corrosion, such as frequent leaks, rust-colored water, or stained dishes or laundry? Note the locations.	Answer
14. Is any electrical equipment grounded to water pipes? Note the locations.	Answer
15. Have there been any complaints about bad (metallic) taste? Note the locations.	Answer

16. Check building files to determine whether any water samples have been taken from your building for any contaminants (also check with your public water supplier). • Name of contaminant(s)? • What concentrations of these contaminants were found? • What was the pH level of the water? • Is testing done regularly at your facility?	Answer
17. Other plumbing questions: • Are blueprints of the building available? • Are there known plumbing "dead-ends," low use areas, existing leaks or other "problem areas"? • Are renovations being planned for part or all of the plumbing system?	Answer