

APPENDIX A
SAMPLING GUIDANCE
Collecting Drinking Water Samples
for Lead Testing At K-12 Schools

This Sampling Guidance is provided by the State Water Resources Control Board (SWRCB) Division of Drinking Water for use by schools and water system staff who will be participating in the collection of samples for the determination of lead in drinking water at K-12 schools. Sampling and testing will be used to help reduce students and staff exposure to lead in the drinking water provided at the school.

This guidance and the instructions for sampling are taken from the US Environmental Protection Agency's 3Ts (Testing, Training, and Telling) for Reducing Lead in Drinking Water in Schools program for measuring and reducing lead at school drinking water locations; however, there are differences between the EPA and SWRCB sampling procedures. The SWRCB procedures used for this testing includes initial sampling to determine the combined lead concentration from the outlet device (bubbler, sink faucet, fountain, etc.) and from the internal plumbing, and repeat sampling to confirm initial sampling test results or to determine the lead concentration after routine, interim, and permanent corrective actions to reduce lead from an outlet device have been completed.

To ensure accurate test results the samples should be collected by following the instructions below for preparation, initial sampling, and repeat sampling.

Preparation

1. At least one school employee should be designated to assist the water system trained sampler during the collection of initial, repeat, confirmation, and check samples and to provide any additional help as necessary to complete the sampling.
2. Select up to five of the busiest locations used for drinking and cooking to be sampled and tested. These locations can be selected by observing students and staff during the morning, break, and lunch periods over as many days as needed until the busiest locations have been identified. The DDW database can accept up to 26 locations (25 sample sites and 1 distribution source site) to be sampled for testing.
3. All faucets, fountains, coolers, bubblers, bottle filling stations, and filtered water dispensers located on the exterior and interior of buildings, including those located in hallways, playgrounds, classrooms, and cafeterias, should be evaluated to assure that all locations have been considered for selection. Large industrial sinks designed for washing and not intended to be used as a source of water for drinking and cooking should not be included.
4. Do not omit from the evaluation and selection process drinking water locations that are served by a point of use filter (a filter attached to the faucet or under the sink) or drinking water locations in buildings or school ground areas that are served by a water softening, conditioning, or filtration treatment system.
5. Each location selected for testing should be assigned a Sample ID. Each Sample ID should use the following format: <Water System No.>-<School ID>-<Sample ID> i.e. 1710001-AAC-A. All repeat, confirmation, and corrective actions samples collected at a location are to be assigned the same Sample ID.
6. A Lead Sampling Plan should be prepared that includes all sample locations and Sample IDs identified on a map of the school grounds. Only water system staff trained in sampling should be collecting the samples. A water system may train a school employee to perform the sampling if necessary.
7. All samples should be collected on a Tuesday, Wednesday, Thursday or Friday morning during periods of normal school operations (school is in session) and not during summer

- school, summer or winter breaks, or other extended breaks. Do not collect the samples on the first day back to school following a vacation, holidays, or weekends.
8. Record the location description, date and time last used, and date and time collected in the Lead Sampling Plan.
 9. All samples must be “first draw samples” meaning that at the time of sampling the drinking water locations must not have been used during the previous 6 hours. To ensure this period of inactivity it may be necessary to protect the sample locations overnight prior to collecting the samples early in the morning before students and staff arrive.
 10. Do not flush a sample site for any length of time prior to the 6 hour period of inactivity and do not flush a sample site at the outlet before collection of the sample.
 11. Leave all angle stops, shutoff valves, and similar devices on the sample line providing water to the drinking water location in a normal state of operation prior to sampling. Do not modify, open, or close any devices located on the sample line in preparation for collecting a sample. Doing so may cause sample results that are not representative of normal operating conditions.
 12. Do not remove any filters, aerators, or screens at any sample outlet prior to collecting the samples.
 13. All sample bottles must be labeled with the Sample IDs for each sample location. All samples must be collected in 1 liter wide mouth plastic bottles and all bottles must be completely filled. Make sure your laboratory provides 1 liter (not 250 mL) wide mouth sample bottles.
 14. If a bottle does not fit at the sample site and cannot be completely filled, a spare 1 liter laboratory bottle may be used to partially fill and transfer the drinking water until the sample bottle is full.
 15. It should be requested to the laboratory to provide unpreserved sample bottles. All samples must be delivered to the testing laboratory within 14 days of collection for preservation.
 16. Cold water must be collected for all samples. If sampling from a drinking water outlet that provides cold and hot water, the cold water handle must be used for sample collection.

Initial Sampling

Initial sampling is used to determine if a drinking water outlet has a lead level that is above or below the Action Level of 15 ppb. Drinking water outlets with a test result of equal to or less than 15 ppb do not need additional testing and a water system is not required to collect additional samples when the initial sample results is less than or equal to 15 ppb. Drinking water outlets with an initial sampling test result of greater than 15 ppb exceed the Action Level and should undergo repeat sampling. Water system staff should provide the initial test results to the school contact person and meet with the school to discuss the results within 10 days of receipt from the laboratory. In the case of an Action Level exceedance water system staff should provide the results to the school within two school business days. Following a review of the initial test results the school should document how it will proceed with each individual drinking water outlet.

1. After completing the preparation steps above, the trained sampler collects initial samples using the Initial Sampling Instructions as guidance.
2. Upon delivery of the samples to the laboratory, the standard laboratory turn-around-time for receiving results is acceptable.
3. All initial sample locations with a test result of less than or equal to 15 ppb have lead levels less than the Action Level, the location is suitable for consumption, and no further testing is needed.
4. All initial sample locations with a test result of greater than 15 ppb have a lead level that exceeds the Action Level and should be tested again by collecting a repeat sample.

5. AB 746 requires after an Action Level is exceeded, the school “shall take immediate steps to make inoperable and shut down from use all fountains and faucets where the excess lead levels may exist.” If a school wishes to resample the initial sample location, the school should complete the sampling as soon as possible, post the fountain or faucet “do not use for drinking”, and continue to use the fountain or faucet for non-drinking purposes until the repeat sample is collected, maintain regular usage. Please see #11 above for additional sampling procedures.
6. Alternatively, drinking water locations with an initial Action Level exceedance can be removed from service permanently or until addressed using the EPA 3Ts recommendations for routine, interim, and permanent corrective actions.
7. Investigate whether other drinking water locations that were not tested but can be reasonably expected to have similar lead levels based on the age, material, location, and/or plumbing configuration and should be removed from service permanently or until addressed using the EPA 3Ts recommendations.
8. A drinking water location with an Action Level exceedance requires that a sample be collected at the service connection to the school to determine the lead level of water entering the school from the distribution system. The service connection sample location should be flushed before sampling (this sample is not a first draw sample) to ensure that the sample is representative of distribution system water quality.
9. The water system cannot release the initial lead sampling data to the public for 60 days following the receipt of the initial sampling results in accordance with the permit amendment.

Repeat and Confirmation Sampling

Repeat sampling is used to confirm an initial sampling result indicating that a drinking water outlet has a lead level that is greater than 15 ppb and exceeds the lead Action Level. Confirmation sampling is used to confirm the lead concentration at a drinking water location following an initial sampling lead result greater than 15 ppb and a repeat sampling lead result less than or equal to 15 ppb. Repeat sampling should be performed within 10 days of receiving the initial sample results and, if necessary, confirmation repeat sampling should be performed within 10 days of receiving the repeat sample results. Drinking water outlets with a repeat Action Level exceedance that confirms an initial sample result should be removed from service until corrective actions and check sampling have been performed with test results that indicate the water outlet has a lead level of less than 15 ppb. Water system staff should provide the repeat test results to the school contact person and meet with the school to discuss the results within 10 days of receipt from the laboratory and in the case of an Action Level exceedance provide the results to the school within two school business days. Following a review of the repeat test results the school should document how it will proceed with each individual drinking water outlet.

1. After completing the preparation steps above, the trained sampler collects repeat samples using the Repeat Sampling Instructions as guidance.
2. Upon delivery of the samples to the laboratory it shall be requested that results are reported by the laboratory within 10 business days.
3. All repeat sample locations with a test result of greater than 15 ppb have a lead level that exceeds the Action Level and should be removed from service permanently or addressed using the EPA 3Ts recommendations for routine, interim, and permanent corrective actions to minimize students and staff exposure to lead in drinking water.
4. All repeat sample locations with a test result of less than or equal to 15 ppb should be tested again by collecting a confirmation repeat sample to confirm the lead concentration at the drinking water outlet.
5. If the confirmation repeat sample has a test result of greater than 15 ppb the outlet has a lead level that exceeds the Action Level and should be removed from service

- permanently or addressed using the EPA 3Ts recommendations for routine, interim, and permanent corrective actions and check sampling.
6. Investigate whether other drinking water locations that were not tested but can be reasonably expected to have similar lead levels based on the age, material, location, and/or plumbing configuration and should be removed from service permanently or until addressed using the EPA 3Ts recommendations.
 7. A drinking water location with an Action Level exceedance requires that a sample be collected at the service connection to the school to determine the lead level of water entering the school from the distribution system. The service connection sample location should be flushed before sampling (this sample is not a first draw sample) to ensure that the sample is representative of distribution system water quality.
 8. If the confirmation repeat sample has a test result of less than or equal to 15 ppb the lead level is less than the Action Level, the location is suitable for consumption, and no further testing is needed.
 9. The water system is not required to collect any additional samples when the repeat result and confirmation repeat result are less than or equal to 15 ppb.
 10. All repeat sample locations with an Action Level exceedance should remain out of service until the school has completed the corrective actions and the water system has completed check sampling identified in the Corrective Action Plan described below in the Laboratory Results section of this guidance document.

Corrective Action Check Sampling

Following the implementation of any corrective action at a drinking water outlet, check sampling should be performed to determine if the corrective action was successful in reducing the lead level to less than 15 ppb. Corrective actions are performed to reduce the lead concentration at a specific outlet; however, it is possible for a corrective action to have no effect or to increase the lead concentration at an outlet. If any check sample has a lead result of greater than the Action Level, additional corrective actions should be performed until the check sample indicates that the drinking water outlet has a lead level of less than 15 ppb. Water system staff should provide the corrective action test results to the school contact person and meet with the school to discuss the results within 10 days of receipt from the laboratory and in the case of an Action Level exceedance provide the results to the school within two school business days. The drinking water outlet should remain out of service during check sampling and until a lead level of less than 15 ppb is obtained for the test result.

The water system is not required to collect additional samples when the corrective action sample result is less than or equal to 15 ppb. If successive corrective actions indicate that the lead level at a drinking water outlet cannot be reduced to equal to or less than the Action Level, the school may choose to permanently remove the outlet from service. Water system staff should provide all laboratory test results to the school contact person upon receipt and in the case of an Action Level exceedance should provide the results within two school business days. Following a review of the check sampling test results the school should document how it will proceed with each individual drinking water outlet.

1. After completing the preparation steps above, the trained sampler collects check samples using the Corrective Action Check Sampling Instructions as guidance.
2. Upon delivery of the samples to the laboratory it shall be requested that results are reported by the laboratory within 10 business days.
3. All check samples with a test result of less than or equal to 15 ppb have lead levels less than the Action Level, no further testing at the drinking water outlet is needed, and the drinking water outlet can be placed back into service.
4. The water system is not required to collect additional samples when the corrective action sample result is less than or equal to 15 ppb.

5. All check samples with a test result of greater than 15 ppb have lead levels greater than the Action Level and additional corrective actions should be implemented at the drinking water outlet.
6. Following each corrective action, collect a check sample for testing to determine if the corrective action was successful in reducing the lead level at the drinking water outlet to less than 15 ppb.
7. Complete the necessary corrective actions and check sampling until a lead level of less than 15 ppb is obtained at which time the drinking water outlet can be placed back into service.

Laboratory Concentrations

The testing laboratory may report the results of the initial and repeat samples in several different formats or units. If the report includes the units of ppb (parts per billion) or ug/L (micrograms per liter) these two are essentially the same and the values in the report can be directly compared to the lead Action Level. If the report includes the units of ppm (parts per million) or mg/L (milligrams per liter) the values in the report must be converted to ppb or ug/L before comparison to the lead Action Level. To convert between units use the following conversion factors:

Convert from ppm to ppb: $1 \text{ ppm} = 1,000 \text{ ppb}$
Convert from mg/L to ug/L: $1 \text{ mg/L} = 1,000 \text{ ug/L}$

For example, if the laboratory reports an initial sample result of 0.007 ppm, the conversion would be $0.007 \text{ ppm} \times 1,000 = 7 \text{ ppb}$. The drinking water outlet has a lead concentration below the Action Level of 15 ppb and no further testing is needed.

If the laboratory reports an initial sample result of 0.021 mg/L, the conversion would be $0.021 \text{ mg/L} \times 1,000 = 21 \text{ ug/L}$. Since the units of ug/L and ppb are essentially the same, the drinking water outlet has a lead concentration above the Action Level of 15 ppb and needs testing again using the Repeat Sampling Instructions.

Laboratory Results

Test results should be reviewed by both the water system and the school prior to making any decisions on Action Level exceedances, repeat, confirmation, and check sampling, corrective actions, and release of the results and testing information to the students, staff, and water system customers.

Under most conditions laboratory results are very accurate and considered final; however, under rare circumstances errors can occur during sampling or in the laboratory and test results may not reflect the true concentration of the drinking water outlet. If you feel this has happened, contact the water system staff who performed the sampling and let them know. Water system staff should contact the local SWRCB DDW office for instructions on how to proceed.

Following the review of initial test results by both the water system and the school, both parties should document which drinking water locations are below the Action Level and need no additional testing, and which drinking water locations are above the Action Level and need repeat testing.

Following review of repeat test results by both the water system and the school, both parties should document which drinking water locations have Action Level exceedances and require corrective actions.

Corrective Action Plan

It is recommended that the school prepare a Corrective Action Plan if initial sample test results exceed the Action Level. The water system may be able to assist. The Corrective Action Plan identifies all drinking water outlets that need corrective actions to bring lead levels to less than or equal to 15 ppb and check sampling to return the drinking water outlets to service. The Corrective Action Plan lists all corrective actions found to be appropriate for each individual drinking water location with an Action Level exceedance. Corrective actions such as an aerator/screen cleaning and maintenance program may be suitable for one drinking outlet while the complete replacement of the outlet may be suitable for another location. Schools should refer to the EPA 3Ts references for detailed information on corrective actions.

The Corrective Action Plan should be completed before releasing the results and testing information to the students, staff, and water system customers as it will help answer questions about Action Level Exceedances and what plans the school has to address the lead contamination issues. The Corrective Action Plan should be updated with the dates that corrective actions are made, the dates check sampling is performed, and the dates each drinking water outlet is returned to service, so that a record is maintained of each drinking water outlet initially having an Action Level exceedance.

Differences Between SWRCB and EPA Sample Collection

Schools are encouraged to read the EPA 3Ts references listed in the SWRCB *Frequently Asked Questions about Lead Sampling of Drinking Water in California Schools* document. SWRCB has prepared the lead testing at schools program using the EPA 3Ts documents, however, there are differences between the two sampling procedures. The table below lists the major differences and highlights the SWRCB procedures that should be followed.

Differences Between SWRCB and EPA Sample Collection				
Sampling Step	SWRCB Sampling Use These Procedures		EPA 3Ts Sampling (Not Used)	
Lead Action Level	15 ppb	If Initial Sample greater than 15 ppb should do repeat sample	20 ppb	If Initial Sample greater than 20 ppb should do follow-up sample
Initial Sample	1 liter	Tests for lead in the sample outlet and internal plumbing	250 mL	Tests for lead in the sample outlet
Repeat Sample	1 liter	Confirms Initial Sample Result	Not used	
Confirmation Repeat Sample	1 liter	Confirms Repeat Sample Result	Not used	
Corrective Action Check Sample	1 liter	Test lead level after implementation of corrective actions	Not used	
Follow-up Sample with 30-second flush	Not used		250 mL	Test for lead in the internal plumbing
Two-step sampling process	Not used		Determines if source of lead is from sample outlet or internal plumbing	

Lead Sampling Plan and Corrective Action Plan	Record water system and school information; record sample collection information noting any important observations during sampling; complete sample location map for all samples; document all routine, interim, and permanent corrective actions implemented		Not used	
Plumbing Profile and Sampling Plan	Not used		Prepare building and plumbing details; Select sites to be tested	
Drinking Outlet Inactivity	6 hours	Sample outlet unused for at least 6 hrs prior to sampling	8-18 hours	Sample outlet unused for at least 8 hrs but no more than 18 hrs prior to sampling

Summary of Repeat Monitoring At Each Sample Site

DDW AND CDE PRESS RELEASE CORRECTION: 2 DAY REPORTING OF RESULTS IS FOR ACTION LEVEL EXCEEDANCES ONLY (SEE BELOW)

Route	Initial Sample Collected within 90 days of request or per alternative sampling plan.	First Repeat Collected within 10 business days of receipt of Initial sample results	Second (Confirmation) Repeat Collected within 10 business days of receipt of First Repeat sample results	Corrective Action Sample Collect Corrective sample after any corrective action
1	Lead is less than or equal to 15 ppb. Monitoring is complete.	No action	No action	No action
2A	Lead is greater than 15 ppb AND the sample site remains in service. Proceed to first repeat.	First Repeat lead sample is greater than 15 ppb. Repeat monitoring is complete. Remove sample site from service.	No action	Corrective action lead sample is greater than 15 ppb. Continue with corrective actions. (School is responsible for additional samples.) OR Corrective action lead sample is less than or equal to 15 ppb. Monitoring is complete.
2B1	Lead is greater than 15 ppb AND the sample site remains in service. Proceed to first repeat.	First Repeat lead sample is less than or equal to 15 ppb. Collect second repeat sample	Second Repeat lead sample is greater than 15 ppb. Repeat monitoring is complete. Remove sample site from service.	
2B2	Lead is greater than 15 ppb AND the sample site remains in service. Proceed to first repeat.	First Repeat lead sample is less than or equal to 15 ppb. Collect second repeat sample	Second Repeat lead sample is less than or equal to 15 ppb. Repeat monitoring is complete.	No action
3	Lead is greater than 15 ppb AND the school removes the sample site from service within 10 business days of the receipt of the sample analysis.	No action	No action	No action

Time Requirements for Reporting Results

- Within 90 days following receipt of a written request for sampling from a school, the water system must either 1) finalize a sampling plan with the school and complete initial sampling, or 2) develop an alternative schedule with the school for preparation of the sampling plan and completing sample collection. An alternative plan must be submitted to DDW for approval within 90 days of receipt of the written request.
- The water system must provide and discuss the sample results (initial, first repeat, second repeat, and corrective action) with the school within 10 days of receipt of the sample results from the testing laboratory, and within 2 business days of receipt when the sample results include an Action Level exceedance.
- First repeat samples must be collected within 10 business days of receipt of the initial sample results; second repeat samples must be collected within 10 business days of receipt of the first repeat results. At least one Corrective Action sample should be collected immediately following installation of the corrective action.
- The water system should request to the laboratory that testing and reporting for all repeat samples be completed in 10 days.
- The water system must not release the sampling results to the public for 60 days following the receipt of the initial sample results unless the water system releases the data in compliance with a Public Records Act (PRA) request for the specific results.
- All lead sample results should be reported electronically by EDT to DDW using the School Lead Sampling and Reporting Tool at <https://drinc.ca.gov/lsics/> It is recommended but not required that a public water system notify DDW of an action level exceedance at the same time they notify the school (via email to DDW-PLU@waterboards.ca.gov).