CALIFORNIA
Water Boards

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ENVIRONMENTAL PROTECTION

State Water Resources Control Board

RECEIVED
August 13, 2018
Commission on
State Mandates

August 13, 2018

VIA CSM DROPBOX

Heather Halsey
Executive Director
Commission on State Mandates
980 Ninth Street, Suite 300
Sacramento, CA 95814

Re: *Lead Sampling in Schools, Permit Amendment No. 2017PA-SCHOOLS, City of San Diego Public Water System No. 3710020, 17-TC-03*, Submission of Administrative Record

Dear Ms. Halsey:

As requested in your letter dated April 13, 2018, attached hereto is the administrative record for Permit Amendment No. 2017-Schools to the Domestic Water Supply Permit Issued to the City of San Diego (Public Water System No. 3710020) (Permit Amendment). The administrative record is comprised of federal and state regulations, guidance, reports, and other authorities which informed the provisions contained in the Permit Amendment.

I declare that all documents attached are true and correct copies of such documents as they exist in the State Water Board's files, or were obtained from publicly available sources.

Very Truly Yours,

David Rice

David Rice
Senior Staff Counsel

cc: Service List via CSM Dropbox

Administrative Record Index
State Water Resources Control Board
Test Claim No. 17-TC-03

1. Federal Lead and Copper Rule (40 C.F.R., § 141.80 *et. seq*.)
2. California Lead and Copper Rule (Cal. Code Regs., tit. 22, § 64670 *et. seq.*)
3. Veto Message for Senate Bill 334 (Oct. 9, 2015)
4. Senate Bill 334
5. U.S. EPA, *3Ts for Reducing Lead in Drinking Water in Schools* (Oct. 2006)
6. U.S. EPA, *Lead and Copper Rule Revisions: White Paper* (Oct. 2016)
7. U.S. EPA, *Implementing the Lead Public Education Provisions of the Lead and Copper Rule: A Guide for Community Water Systems* (June 2002)
8. U.S. EPA, *Getting the Lead Out: A Guide to Reducing Lead in Drinking Water in Schools* (Oct. 2005)
9. U.S. EPA*, Clarification of Recommended Tap Sampling Procedures for Purposes of the Lead and Copper Rule* (Feb. 29, 2016)
10. U.S. EPA, *Drinking Water Best Management Practices: For Schools and Child Care Facilities With Their Own Drinking Water Source* (Apr. 2013)
11. California Department of Education, *Letter Re Clean Water* (June 17, 2016)
12. State Water Board, *Recommendations for Enhanced Public Access to Lead and Copper Rule Related Information* (Mar. 7, 2016)
13. State of California, *Public Health Goals for Chemicals in Drinking Water* (Apr. 2009)
14. California Department of Public Health, *Blood Lead Levels for Children* (2015)
15. Minnesota Department of Health, *Reducing Lead in Drinking Water: A Technical Guidance for Minnesota’s School and Child Care Facilities* (Apr. 2014)

ATTACHMENT

1

Code of Federal Regulations
Title 40. Protection of Environment
Chapter I. Environmental Protection Agency (Refs & Annos)
Subchapter D. Water Programs
Part 141. National Primary Drinking Water Regulations (Refs & Annos)
Subpart I. Control of Lead and Copper (Refs & Annos)

40 C.F.R. § 141.80

§ 141.80 General requirements.

Effective: December 10, 2007
Currentness

(a) Applicability and effective dates.

(1) The requirements of this subpart I constitute the national primary drinking water regulations for lead and copper. Unless otherwise indicated, each of the provisions of this subpart applies to community water systems and non-transient, non-community water systems (hereinafter referred to as "water systems" or "systems").

(2) [Reserved by 72 FR 57814]

(b) Scope. These regulations establish a treatment technique that includes requirements for corrosion control treatment, source water treatment, lead service line replacement, and public education. These requirements are triggered, in some cases, by lead and copper action levels measured in samples collected at consumers' taps.

(c) Lead and copper action levels.

(1) The lead action level is exceeded if the concentration of lead in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with § 141.86 is greater than 0.015 mg/L (i.e., if the "90th percentile" lead level is greater than 0.015 mg/L).

(2) The copper action level is exceeded if the concentration of copper in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with § 141.86 is greater than 1.3 mg/L (i.e., if the "90th percentile" copper level is greater than 1.3 mg/L).

(3) The 90th percentile lead and copper levels shall be computed as follows:

(i) The results of all lead or copper samples taken during a monitoring period shall be placed in ascending order from the sample with the lowest concentration to the sample with the highest concentration. Each sampling result shall be assigned a number, ascending by single integers beginning with the number 1 for the sample with the lowest contaminant level. The number assigned to the sample with the highest contaminant level shall be equal to the total number of samples taken.

(ii) The number of samples taken during the monitoring period shall be multiplied by 0.9.

(iii) The contaminant concentration in the numbered sample yielded by the calculation in paragraph (c)(3)(ii) is the 90th percentile contaminant level.

(iv) For water systems serving fewer than 100 people that collect 5 samples per monitoring period, the 90th percentile is computed by taking the average of the highest and second highest concentrations.

(v) For a public water system that has been allowed by the State to collect fewer than five samples in accordance with § 141.86(c), the sample result with the highest concentration is considered the 90th percentile value.

(d) Corrosion control treatment requirements.

(1) All water systems shall install and operate optimal corrosion control treatment as defined in § 141.2.

(2) Any water system that complies with the applicable corrosion control treatment requirements specified by the State under §§ 141.81 and 141.82 shall be deemed in compliance with the treatment requirement contained in paragraph (d)(1) of this section.

(e) Source water treatment requirements. Any system exceeding the lead or copper action level shall implement all applicable source water treatment requirements specified by the State under § 141.83.

(f) Lead service line replacement requirements. Any system exceeding the lead action level after implementation of applicable corrosion control and source water treatment requirements shall complete the lead service line replacement requirements contained in § 141.84.

(g) Public education requirements. Pursuant to § 141.85, all water systems must provide a consumer notice of lead tap water monitoring results to persons served at the sites (taps) that are tested. Any system exceeding the lead action level shall implement the public education requirements.

(h) Monitoring and analytical requirements. Tap water monitoring for lead and copper, monitoring for water quality parameters, source water monitoring for lead and copper, and analyses of the monitoring results under this subpart shall be completed in compliance with §§ 141.86, 141.87, 141.88, and 141.89.

(i) Reporting requirements. Systems shall report to the State any information required by the treatment provisions of this subpart and § 141.90.

(j) Recordkeeping requirements. Systems shall maintain records in accordance with § 141.91.

(k) Violation of national primary drinking water regulations. Failure to comply with the applicable requirements of §§ 141.80–141.91, including requirements established by the State pursuant to these provisions, shall constitute a violation of the national primary drinking water regulations for lead and/or copper.

Credits
[56 FR 32113, July 15, 1991; 57 FR 28788, June 29, 1992; 72 FR 57814, Oct. 10, 2007]

AUTHORITY: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

Notes of Decisions (10)

Current through Aug. 3, 2018; 83 FR 38243.

40 C.F.R. § 141.81

§ 141.81 Applicability of corrosion control treatment steps to small, medium-size and large water systems.

Effective: December 10, 2007
Currentness

(a) Systems shall complete the applicable corrosion control treatment requirements described in § 141.82 by the deadlines established in this section.

(1) A large system (serving >50,000 persons) shall complete the corrosion control treatment steps specified in paragraph (d) of this section, unless it is deemed to have optimized corrosion control under paragraph (b)(2) or (b)(3) of this section.

(2) A small system (serving ≤3300 persons) and a medium-size system (serving >3,300 and ≤50,000 persons) shall complete the corrosion control treatment steps specified in paragraph (e) of this section, unless it is deemed to have optimized corrosion control under paragraph (b)(1), (b)(2), or (b)(3) of this section.

(b) A system is deemed to have optimized corrosion control and is not required to complete the applicable corrosion control treatment steps identified in this section if the system satisfies one of the criteria specified in paragraphs (b)(1) through (b)(3) of this section. Any such system deemed to have optimized corrosion control under this paragraph, and which has treatment in place, shall continue to operate and maintain optimal corrosion control treatment and meet any requirements that the State determines appropriate to ensure optimal corrosion control treatment is maintained.

(1) A small or medium-size water system is deemed to have optimized corrosion control if the system meets the lead and copper action levels during each of two consecutive six-month monitoring periods conducted in accordance with § 141.86.

(2) Any water system may be deemed by the State to have optimized corrosion control treatment if the system demonstrates to the satisfaction of the State that it has conducted activities equivalent to the corrosion control steps applicable to such system under this section. If the State makes this determination, it shall provide the system with written notice explaining the basis for its decision and shall specify the water quality control parameters representing optimal corrosion control in accordance with § 141.82(f). Water systems deemed to have optimized corrosion control under this paragraph shall operate in compliance with the State–designated optimal water quality control parameters in accordance with § 141.82(g) and continue to conduct lead and copper tap and water quality parameter sampling in accordance with § 141.86(d)(3) and § 141.87(d), respectively. A system shall provide the State with the following information in order to support a determination under this paragraph:

(i) The results of all test samples collected for each of the water quality parameters in § 141.82(c)(3).

(ii) A report explaining the test methods used by the water system to evaluate the corrosion control treatments listed in § 141.82(c)(1), the results of all tests conducted, and the basis for the system's selection of optimal corrosion control treatment;

(iii) A report explaining how corrosion control has been installed and how it is being maintained to insure minimal lead and copper concentrations at consumers' taps; and

(iv) The results of tap water samples collected in accordance with § 141.86 at least once every six months for one year after corrosion control has been installed.

(3) Any water system is deemed to have optimized corrosion control if it submits results of tap water monitoring conducted in accordance with § 141.86 and source water monitoring conducted in accordance with § 141.88 that demonstrates for two consecutive 6–month monitoring periods that the difference between the 90th percentile tap water lead level computed under § 141.80(c)(3), and the highest source water lead concentration is less than the Practical Quantitation Level for lead specified in § 141.89(a)(1)(ii).

(i) Those systems whose highest source water lead level is below the Method Detection Limit may also be deemed to have optimized corrosion control under this paragraph if the 90th percentile tap water lead level is less than or equal to the Practical Quantitation Level for lead for two consecutive 6–month monitoring periods.

(ii) Any water system deemed to have optimized corrosion control in accordance with this paragraph shall continue monitoring for lead and copper at the tap no less frequently than once every three calendar years using the reduced number of sites specified in § 141.86(c) and collecting the samples at times and locations specified in § 141.86(d)(4)(iv). Any such system that has not conducted a round of monitoring pursuant to § 141.86(d) since September 30, 1997, shall complete a round of monitoring pursuant to this paragraph no later than September 30, 2000.

(iii) Any water system deemed to have optimized corrosion control pursuant to this paragraph shall notify the State in writing pursuant to § 141.90(a)(3) of any upcoming long-term change in treatment or addition of a new source as described in that section. The State must review and approve the addition of a new source or long-term change in water treatment before it is implemented by the water system. The State may require any such system to conduct additional monitoring or to take other action the State deems appropriate to ensure that such systems maintain minimal levels of corrosion in the distribution system.

(iv) As of July 12, 2001, a system is not deemed to have optimized corrosion control under this paragraph, and shall implement corrosion control treatment pursuant to paragraph (b)(3)(v) of this section unless it meets the copper action level.

(v) Any system triggered into corrosion control because it is no longer deemed to have optimized corrosion control under this paragraph shall implement corrosion control treatment in accordance with the deadlines in paragraph

(e) of this section. Any such large system shall adhere to the schedule specified in that paragraph for medium-size systems, with the time periods for completing each step being triggered by the date the system is no longer deemed to have optimized corrosion control under this paragraph.

(c) Any small or medium-size water system that is required to complete the corrosion control steps due to its exceedance of the lead or copper action level may cease completing the treatment steps whenever the system meets both action levels during each of two consecutive monitoring periods conducted pursuant to § 141.86 and submits the results to the State. If any such water system thereafter exceeds the lead or copper action level during any monitoring period, the system (or the State, as the case may be) shall recommence completion of the applicable treatment steps, beginning with the first treatment step which was not previously completed in its entirety. The State may require a system to repeat treatment steps previously completed by the system where the State determines that this is necessary to implement properly the treatment requirements of this section. The State shall notify the system in writing of such a determination and explain the basis for its decision. The requirement for any small- or medium-size system to implement corrosion control treatment steps in accordance with paragraph (e) of this section (including systems deemed to have optimized corrosion control under paragraph (b)(1) of this section) is triggered whenever any small- or medium-size system exceeds the lead or copper action level.

(d) Treatment steps and deadlines for large systems. Except as provided in paragraph (b)(2) and (3) of this section, large systems shall complete the following corrosion control treatment steps (described in the referenced portions of §§ 141.82, 141.86, and 141.87) by the indicated dates.

(1) Step 1: The system shall conduct initial monitoring (§ 141.86(d)(1) and § 141.87(b)) during two consecutive six-month monitoring periods by January 1, 1993.

(2) Step 2: The system shall complete corrosion control studies (§ 141.82(c)) by July 1, 1994.

(3) Step 3: The State shall designate optimal corrosion control treatment (§ 141.82(d)) by January 1, 1995.

(4) Step 4: The system shall install optimal corrosion control treatment (§ 141.82(e)) by January 1, 1997.

(5) Step 5: The system shall complete follow-up sampling (§ 141.86(d)(2) and § 141.87(c)) by January 1, 1998.

(6) Step 6: The State shall review installation of treatment and designate optimal water quality control parameters (§ 141.82(f)) by July 1, 1998.

(7) Step 7: The system shall operate in compliance with the State-specified optimal water quality control parameters (§ 141.82(g)) and continue to conduct tap sampling (§ 141.86(d)(3) and § 141.87(d)).

(e) Treatment Steps and deadlines for small and medium-size systems. Except as provided in paragraph (b) of this section, small and medium-size systems shall complete the following corrosion control treatment steps (described in the referenced portions of §§ 141.82, 141.86 and 141.87) by the indicated time periods.

(1) Step 1: The system shall conduct initial tap sampling (§ 141.86(d)(1) and § 141.87(b)) until the system either exceeds the lead or copper action level or becomes eligible for reduced monitoring under § 141.86(d)(4). A system exceeding the lead or copper action level shall recommend optimal corrosion control treatment (§ 141.82(a)) within six months after the end of the monitoring period during which it exceeds one of the action levels.

(2) Step 2: Within 12 months after the end of the monitoring period during which a system exceeds the lead or copper action level, the State may require the system to perform corrosion control studies (§ 141.82(b)). If the State does not require the system to perform such studies, the State shall specify optimal corrosion control treatment (§ 141.82(d)) within the following timeframes:

(i) For medium-size systems, within 18 months after the end of the monitoring period during which such system exceeds the lead or copper action level.

(ii) For small systems, within 24 months after the end of the monitoring period during which such system exceeds the lead or copper action level.

(3) Step 3: If the State requires a system to perform corrosion control studies under step 2, the system shall complete the studies (§ 141.82(c)) within 18 months after the State requires that such studies be conducted.

(4) Step 4: If the system has performed corrosion control studies under step 2, the State shall designate optimal corrosion control treatment (§ 141.82(d)) within 6 months after completion of step 3.

(5) Step 5: The system shall install optimal corrosion control treatment (§ 141.82(e)) within 24 months after the State designates such treatment.

(6) Step 6: The system shall complete follow-up sampling (§ 141.86(d)(2) and § 141.87(c)) within 36 months after the State designates optimal corrosion control treatment.

(7) Step 7: The State shall review the system's installation of treatment and designate optimal water quality control parameters (§ 141.82(f)) within 6 months after completion of step 6.

(8) Step 8: The system shall operate in compliance with the State-designated optimal water quality control parameters (§ 141.82(g)) and continue to conduct tap sampling (§ 141.86(d)(3) and § 141.87(d)).

Credits
[56 FR 32113, July 15, 1991; 59 FR 33862, June 30, 1994; 65 FR 2004, Jan. 12, 2000; 72 FR 57814, Oct. 10, 2007]

AUTHORITY: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

Notes of Decisions (4)

Current through Aug. 3, 2018; 83 FR 38243.

40 C.F.R. § 141.82

§ 141.82 Description of corrosion control treatment requirements.

Currentness

Each system shall complete the corrosion control treatment requirements described below which are applicable to such system under § 141.81.

(a) System recommendation regarding corrosion control treatment. Based upon the results of lead and copper tap monitoring and water quality parameter monitoring, small and medium-size water systems exceeding the lead or copper action level shall recommend installation of one or more of the corrosion control treatments listed in paragraph (c)(1) of this section which the system believes constitutes optimal corrosion control for that system. The State may require the system to conduct additional water quality parameter monitoring in accordance with § 141.87(b) to assist the State in reviewing the system's recommendation.

(b) State decision to require studies of corrosion control treatment (applicable to small and medium-size systems). The State may require any small or medium-size system that exceeds the lead or copper action level to perform corrosion control studies under paragraph (c) of this section to identify optimal corrosion control treatment for the system.

(c) Performance of corrosion control studies.

(1) Any public water system performing corrosion control studies shall evaluate the effectiveness of each of the following treatments, and, if appropriate, combinations of the following treatments to identify the optimal corrosion control treatment for that system:

(i) Alkalinity and pH adjustment;

(ii) Calcium hardness adjustment; and

(iii) The addition of a phosphate or silicate based corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration in all test tap samples.

(2) The water system shall evaluate each of the corrosion control treatments using either pipe rig/loop tests, metal coupon tests, partial-system tests, or analyses based on documented analogous treatments with other systems of similar size, water chemistry and distribution system configuration.

(3) The water system shall measure the following water quality parameters in any tests conducted under this paragraph before and after evaluating the corrosion control treatments listed above:

(i) Lead;

(ii) Copper;

(iii) pH;

(iv) Alkalinity;

(v) Calcium;

(vi) Conductivity;

(vii) Orthophosphate (when an inhibitor containing a phosphate compound is used);

(viii) Silicate (when an inhibitor containing a silicate compound is used);

(ix) Water temperature.

(4) The water system shall identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment and document such constraints with at least one of the following:

(i) Data and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used by another water system with comparable water quality characteristics; and/or

(ii) Data and documentation demonstrating that the water system has previously attempted to evaluate a particular corrosion control treatment and has found that the treatment is ineffective or adversely affects other water quality treatment processes.

(5) The water system shall evaluate the effect of the chemicals used for corrosion control treatment on other water quality treatment processes.

(6) On the basis of an analysis of the data generated during each evaluation, the water system shall recommend to the State in writing the treatment option that the corrosion control studies indicate constitutes optimal corrosion control treatment for that system. The water system shall provide a rationale for its recommendation along with all supporting documentation specified in paragraphs (c)(1) through (5) of this section.

(d) State designation of optimal corrosion control treatment.

(1) Based upon consideration of available information including, where applicable, studies performed under paragraph (c) of this section and a system's recommended treatment alternative, the State shall either approve the corrosion control treatment option recommended by the system, or designate alternative corrosion control treatment(s) from among those listed in paragraph (c)(1) of this section. When designating optimal treatment the State shall consider the effects that additional corrosion control treatment will have on water quality parameters and on other water quality treatment processes.

(2) The State shall notify the system of its decision on optimal corrosion control treatment in writing and explain the basis for this determination. If the State requests additional information to aid its review, the water system shall provide the information.

(e) Installation of optimal corrosion control. Each system shall properly install and operate throughout its distribution system the optimal corrosion control treatment designated by the State under paragraph (d) of this section.

(f) State review of treatment and specification of optimal water quality control parameters. The State shall evaluate the results of all lead and copper tap samples and water quality parameter samples submitted by the water system and determine whether the system has properly installed and operated the optimal corrosion control treatment designated by the State in paragraph (d) of this section. Upon reviewing the results of tap water and water quality parameter monitoring by the system, both before and after the system installs optimal corrosion control treatment, the State shall designate:

(1) A minimum value or a range of values for pH measured at each entry point to the distribution system;

(2) A minimum pH value, measured in all tap samples. Such value shall be equal to or greater than 7.0, unless the State determines that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the system to optimize corrosion control;

(3) If a corrosion inhibitor is used, a minimum concentration or a range of concentrations for the inhibitor, measured at each entry point to the distribution system and in all tap samples, that the State determines is necessary to form a passivating film on the interior walls of the pipes of the distribution system;

(4) If alkalinity is adjusted as part of optimal corrosion control treatment, a minimum concentration or a range of concentrations for alkalinity, measured at each entry point to the distribution system and in all tap samples;

(5) If calcium carbonate stabilization is used as part of corrosion control, a minimum concentration or a range of concentrations for calcium, measured in all tap samples.

The values for the applicable water quality control parameters listed above shall be those that the State determines to reflect optimal corrosion control treatment for the system. The State may designate values for additional water quality control parameters determined by the State to reflect optimal corrosion control for the system. The State shall notify the system in writing of these determinations and explain the basis for its decisions.

(g) Continued operation and monitoring. All systems optimizing corrosion control shall continue to operate and maintain optimal corrosion control treatment, including maintaining water quality parameters at or above minimum values or within ranges designated by the State under paragraph (f) of this section, in accordance with this paragraph for all samples collected under § 141.87(d) through (f). Compliance with the requirements of this paragraph shall be determined every six months, as specified under § 141.87(d). A water system is out of compliance with the requirements of this paragraph for a six-month period if it has excursions for any State–specified parameter on more than nine days during the period. An excursion occurs whenever the daily value for one or more of the water quality parameters measured at a sampling location is below the minimum value or outside the range designated by the State. Daily values are calculated as follows. States have discretion to delete results of obvious sampling errors from this calculation.

(1) On days when more than one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the average of all results collected during the day regardless of whether they are collected through continuous monitoring, grab sampling, or a combination of both. If EPA has approved an alternative formula under § 142.16 of this chapter in the State's application for a program revision submitted pursuant to § 142.12 of this chapter, the State's formula shall be used to aggregate multiple measurements taken at a sampling point for the water quality parameter in lieu of the formula in this paragraph.

(2) On days when only one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the result of that measurement.

(3) On days when no measurement is collected for the water quality parameter at the sampling location, the daily value shall be the daily value calculated on the most recent day on which the water quality parameter was measured at the sample site.

(h) Modification of State treatment decisions. Upon its own initiative or in response to a request by a water system or other interested party, a State may modify its determination of the optimal corrosion control treatment under paragraph (d) of this section or optimal water quality control parameters under paragraph (f) of this section. A request for modification by a system or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The State may modify its determination where it concludes that such change is necessary to ensure that the system continues to optimize corrosion control treatment. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the State's decision, and provide an implementation schedule for completing the treatment modifications.

(i) Treatment decisions by EPA in lieu of the State. Pursuant to the procedures in § 142.19, the EPA Regional Administrator may review treatment determinations made by a State under paragraphs (d), (f), or (h) of this section and issue federal treatment determinations consistent with the requirements of those paragraphs where the Regional Administrator finds that:

(1) A State has failed to issue a treatment determination by the applicable deadlines contained in § 141.81,

(2) A State has abused its discretion in a substantial number of cases or in cases affecting a substantial population, or

(3) The technical aspects of a State's determination would be indefensible in an expected Federal enforcement action taken against a system.

Credits
[56 FR 32113, July 15, 1991; 65 FR 2004, Jan. 12, 2000]

AUTHORITY: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

Notes of Decisions (4)

Current through Aug. 3, 2018; 83 FR 38243.

40 C.F.R. § 141.83

§ 141.83 Source water treatment requirements.

Effective: December 10, 2007
Currentness

Systems shall complete the applicable source water monitoring and treatment requirements (described in the referenced portions of paragraph (b) of this section, and in §§ 141.86, and 141.88) by the following deadlines.

(a) Deadlines for completing source water treatment steps—

(1) Step 1: A system exceeding the lead or copper action level shall complete lead and copper source water monitoring (§ 141.88(b)) and make a treatment recommendation to the State (§ 141.83(b)(1)) no later than 180 days after the end of the monitoring period during which the lead or copper action level was exceeded.

(2) Step 2: The State shall make a determination regarding source water treatment (§ 141.83(b)(2)) within 6 months after submission of monitoring results under step 1.

(3) Step 3: If the State requires installation of source water treatment, the system shall install the treatment (§ 141.83(b)(3)) within 24 months after completion of step 2.

(4) Step 4: The system shall complete follow-up tap water monitoring (§ 141.86(d)(2) and source water monitoring (§ 141.88(c)) within 36 months after completion of step 2.

(5) Step 5: The State shall review the system's installation and operation of source water treatment and specify maximum permissible source water levels (§ 141.83(b)(4)) within 6 months after completion of step 4.

(6) Step 6: The system shall operate in compliance with the State-specified maximum permissible lead and copper source water levels (§ 141.83(b)(4)) and continue source water monitoring (§ 141.88(d)).

(b) Description of source water treatment requirements—

(1) System treatment recommendation. Any system which exceeds the lead or copper action level shall recommend in writing to the State the installation and operation of one of the source water treatments listed in paragraph (b)(2) of this section. A system may recommend that no treatment be installed based upon a demonstration that source water treatment is not necessary to minimize lead and copper levels at users' taps.

(2) State determination regarding source water treatment. The State shall complete an evaluation of the results of all source water samples submitted by the water system to determine whether source water treatment is necessary to minimize lead or copper levels in water delivered to users' taps. If the State determines that treatment is needed, the State shall either require installation and operation of the source water treatment recommended by the system (if any) or require the installation and operation of another source water treatment from among the following: Ion exchange, reverse osmosis, lime softening or coagulation/filtration. If the State requests additional information to aid in its review, the water system shall provide the information by the date specified by the State in its request. The State shall notify the system in writing of its determination and set forth the basis for its decision.

(3) Installation of source water treatment. Each system shall properly install and operate the source water treatment designated by the State under paragraph (b)(2) of this section.

(4) State review of source water treatment and specification of maximum permissible source water levels. The State shall review the source water samples taken by the water system both before and after the system installs source water treatment, and determine whether the system has properly installed and operated the source water treatment designated by the State. Based upon its review, the State shall designate the maximum permissible lead and copper concentrations for finished water entering the distribution system. Such levels shall reflect the contaminant removal capability of the treatment properly operated and maintained. The State shall notify the system in writing and explain the basis for its decision.

(5) Continued operation and maintenance. Each water system shall maintain lead and copper levels below the maximum permissible concentrations designated by the State at each sampling point monitored in accordance with § 141.88. The system is out of compliance with this paragraph if the level of lead or copper at any sampling point is greater than the maximum permissible concentration designated by the State.

(6) Modification of State treatment decisions. Upon its own initiative or in response to a request by a water system or other interested party, a State may modify its determination of the source water treatment under paragraph (b)(2) of this section, or maximum permissible lead and copper concentrations for finished water entering the distribution system under paragraph (b)(4) of this section. A request for modification by a system or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The State may modify its determination where it concludes that such change is necessary to ensure that the system continues to minimize lead and copper concentrations in source water. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the State's decision, and provide an implementation schedule for completing the treatment modifications.

(7) Treatment decisions by EPA in lieu of the State. Pursuant to the procedures in § 142.19, the EPA Regional Administrator may review treatment determinations made by a State under paragraphs (b)(2), (4), or (6) of this section and issue Federal treatment determinations consistent with the requirements of those paragraphs where the Administrator finds that:

(i) A State has failed to issue a treatment determination by the applicable deadlines contained in § 141.83(a),

(ii) A state has abused its discretion in a substantial number of cases or in cases affecting a substantial population, or

(iii) The technical aspects of a State's determination would be indefensible in an expected Federal enforcement action taken against a system.

Credits
[56 FR 32113, July 15, 1991; 72 FR 57815, Oct. 10, 2007]

AUTHORITY: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

Current through Aug. 3, 2018; 83 FR 38243.

End of Document

40 C.F.R. § 141.84

§ 141.84 Lead service line replacement requirements.

Effective: December 10, 2007
Currentness

(a) Systems that fail to meet the lead action level in tap samples taken pursuant to § 141.86(d)(2), after installing corrosion control and/or source water treatment (whichever sampling occurs later), shall replace lead service lines in accordance with the requirements of this section. If a system is in violation of § 141.81 or § 141.83 for failure to install source water or corrosion control treatment, the State may require the system to commence lead service line replacement under this section after the date by which the system was required to conduct monitoring under § 141.86(d)(2) has passed.

(b)(1) A water system shall replace annually at least 7 percent of the initial number of lead service lines in its distribution system. The initial number of lead service lines is the number of lead lines in place at the time the replacement program begins. The system shall identify the initial number of lead service lines in its distribution system, including an identification of the portion(s) owned by the system, based on a materials evaluation, including the evaluation required under § 141.86(a) and relevant legal authorities (e.g., contracts, local ordinances) regarding the portion owned by the system. The first year of lead service line replacement shall begin on the first day following the end of the monitoring period in which the action level was exceeded under paragraph (a) of this section. If monitoring is required annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs. If the State has established an alternate monitoring period, then the end of the monitoring period will be the last day of that period.

(2) Any water system resuming a lead service line replacement program after the cessation of its lead service line replacement program as allowed by paragraph (f) of this section shall update its inventory of lead service lines to include those sites that were previously determined not to require replacement through the sampling provision under paragraph (c) of this section. The system will then divide the updated number of remaining lead service lines by the number of remaining years in the program to determine the number of lines that must be replaced per year (7 percent lead service line replacement is based on a 15–year replacement program, so, for example, systems resuming lead service line replacement after previously conducting two years of replacement would divide the updated inventory by 13). For those systems that have completed a 15–year lead service line replacement program, the State will determine a schedule for replacing or retesting lines that were previously tested out under the replacement program when the system re-exceeds the action level.

(c) A system is not required to replace an individual lead service line if the lead concentration in all service line samples from that line, taken pursuant to § 141.86(b)(3), is less than or equal to 0.015 mg/L.

(d) A water system shall replace that portion of the lead service line that it owns. In cases where the system does not own the entire lead service line, the system shall notify the owner of the line, or the owner's authorized agent, that the system will replace the portion of the service line that it owns and shall offer to replace the owner's portion of the line. A system is not required to bear the cost of replacing the privately-owned portion of the line, nor is it required to replace the privately-owned portion where the owner chooses not to pay the cost of replacing the privately-owned portion of the line, or where replacing the privately-owned portion would be precluded by State, local or common law. A water system that does not replace the entire length of the service line also shall complete the following tasks.

(1) At least 45 days prior to commencing with the partial replacement of a lead service line, the water system shall provide notice to the resident(s) of all buildings served by the line explaining that they may experience a temporary increase of lead levels in their drinking water, along with guidance on measures consumers can take to minimize their exposure to lead. The State may allow the water system to provide notice under the previous sentence less than 45 days prior to commencing partial lead service line replacement where such replacement is in conjunction with emergency repairs. In addition, the water system shall inform the resident(s) served by the line that the system will, at the system's expense, collect a sample from each partially-replaced lead service line that is representative of the water in the service line for analysis of lead content, as prescribed under § 141.86(b)(3), within 72 hours after the completion of the partial replacement of the service line. The system shall collect the sample and report the results of the analysis to the owner and the resident(s) served by the line within three business days of receiving the results. Mailed notices post-marked within three business days of receiving the results shall be considered “on time.”

(2) The water system shall provide the information required by paragraph (d)(1) of this section to the residents of individual dwellings by mail or by other methods approved by the State. In instances where multi-family dwellings are served by the line, the water system shall have the option to post the information at a conspicuous location.

(e) The State shall require a system to replace lead service lines on a shorter schedule than that required by this section, taking into account the number of lead service lines in the system, where such a shorter replacement schedule is feasible. The State shall make this determination in writing and notify the system of its finding within 6 months after the system is triggered into lead service line replacement based on monitoring referenced in paragraph (a) of this section.

(f) Any system may cease replacing lead service lines whenever first draw samples collected pursuant to § 141.86(b)(2) meet the lead action level during each of two consecutive monitoring periods and the system submits the results to the State. If first draw tap samples collected in any such system thereafter exceeds the lead action level, the system shall recommence replacing lead service lines pursuant to paragraph (b)(2) of this section.

(g) To demonstrate compliance with paragraphs (a) through (d) of this section, a system shall report to the State the information specified in § 141.90(e).

Credits
[56 FR 32113, July 15, 1991; 57 FR 28788, June 29, 1992; 65 FR 2005, Jan. 12, 2000; 72 FR 57815, Oct. 10, 2007]

AUTHORITY: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

Notes of Decisions (4)

Current through Aug. 3, 2018; 83 FR 38243.

Code of Federal Regulations
Title 40. Protection of Environment
Chapter I. Environmental Protection Agency (Refs & Annos)
Subchapter D. Water Programs
Part 141. National Primary Drinking Water Regulations (Refs & Annos)
Subpart I. Control of Lead and Copper (Refs & Annos)

40 C.F.R. § 141.85

§ 141.85 Public education and supplemental monitoring requirements.

Effective: December 10, 2007
Currentness

All water systems must deliver a consumer notice of lead tap water monitoring results to persons served by the water system at sites that are tested, as specified in paragraph (d) of this section. A water system that exceeds the lead action level based on tap water samples collected in accordance with § 141.86 shall deliver the public education materials contained in paragraph (a) of this section in accordance with the requirements in paragraph (b) of this section. Water systems that exceed the lead action level must sample the tap water of any customer who requests it in accordance with paragraph (c) of this section.

(a) Content of written public education materials—

(1) Community water systems and non-transient non-community water systems. Water systems must include the following elements in printed materials (e.g., brochures and pamphlets) in the same order as listed below. In addition, language in paragraphs (a)(1)(i) through (ii) and (a)(1)(vi) of this section must be included in the materials, exactly as written, except for the text in brackets in these paragraphs for which the water system must include system-specific information. Any additional information presented by a water system must be consistent with the information below and be in plain language that can be understood by the general public. Water systems must submit all written public education materials to the State prior to delivery. The State may require the system to obtain approval of the content of written public materials prior to delivery.

(i) IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER. [INSERT NAME OF WATER SYSTEM] found elevated levels of lead in drinking water in some homes/buildings. Lead can cause serious health problems, especially for pregnant women and young children. Please read this information closely to see what you can do to reduce lead in your drinking water.

(ii) Health effects of lead. Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

(iii) Sources of Lead.

(A) Explain what lead is.

(B) Explain possible sources of lead in drinking water and how lead enters drinking water. Include information on home/building plumbing materials and service lines that may contain lead.

(C) Discuss other important sources of lead exposure in addition to drinking water (e.g., paint).

(iv) Discuss the steps the consumer can take to reduce their exposure to lead in drinking water.

(A) Encourage running the water to flush out the lead.

(B) Explain concerns with using hot water from the tap and specifically caution against the use of hot water for preparing baby formula.

(C) Explain that boiling water does not reduce lead levels.

(D) Discuss other options consumers can take to reduce exposure to lead in drinking water, such as alternative sources or treatment of water.

(E) Suggest that parents have their child's blood tested for lead.

(v) Explain why there are elevated levels of lead in the system's drinking water (if known) and what the water system is doing to reduce the lead levels in homes/buildings in this area.

(vi) For more information, call us at [INSERT YOUR NUMBER] [(IF APPLICABLE), or visit our Web site at [INSERT YOUR WEB SITE HERE]]. For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's Web site at http://www.epa.gov/lead or contact your health care provider.

(2) Community water systems. In addition to including the elements specified in paragraph (a)(1) of this section, community water systems must:

(i) Tell consumers how to get their water tested.

(ii) Discuss lead in plumbing components and the difference between low lead and lead free.

(b) Delivery of public education materials.

(1) For public water systems serving a large proportion of non–English speaking consumers, as determined by the State, the public education materials must contain information in the appropriate language(s) regarding the importance of the notice or contain a telephone number or address where persons served may contact the water system to obtain a translated copy of the public education materials or to request assistance in the appropriate language.

(2) A community water system that exceeds the lead action level on the basis of tap water samples collected in accordance with § 141.86, and that is not already conducting public education tasks under this section, must conduct the public education tasks under this section within 60 days after the end of the monitoring period in which the exceedance occurred:

(i) Deliver printed materials meeting the content requirements of paragraph (a) of this section to all bill paying customers.

(ii)(A) Contact customers who are most at risk by delivering education materials that meet the content requirements of paragraph (a) of this section to local public health agencies even if they are not located within the water system's service area, along with an informational notice that encourages distribution to all the organization's potentially affected customers or community water system's users. The water system must contact the local public health agencies directly by phone or in person. The local public health agencies may provide a specific list of additional community based organizations serving target populations, which may include organizations outside the service area of the water system. If such lists are provided, systems must deliver education materials that meet the content requirements of paragraph (a) of this section to all organizations on the provided lists.

(B) Contact customers who are most at risk by delivering materials that meet the content requirements of paragraph (a) of this section to the following organizations listed in 1 through 6 that are located within the water system's service area, along with an informational notice that encourages distribution to all the organization's potentially affected customers or community water system's users:

(1) Public and private schools or school boards.

(2) Women, Infants and Children (WIC) and Head Start programs.

(3) Public and private hospitals and medical clinics.

(4) Pediatricians.

(5) Family planning clinics.

(6) Local welfare agencies.

(C) Make a good faith effort to locate the following organizations within the service area and deliver materials that meet the content requirements of paragraph (a) of this section to them, along with an informational notice that encourages distribution to all potentially affected customers or users. The good faith effort to contact at-risk customers may include requesting a specific contact list of these organizations from the local public health agencies, even if the agencies are not located within the water system's service area:

(1) Licensed childcare centers

(2) Public and private preschools.

(3) Obstetricians–Gynecologists and Midwives.

(iii) No less often than quarterly, provide information on or in each water bill as long as the system exceeds the action level for lead. The message on the water bill must include the following statement exactly as written except for the text in brackets for which the water system must include system-specific information: [INSERT NAME OF WATER SYSTEM] found high levels of lead in drinking water in some homes. Lead can cause serious health problems. For more information please call [INSERT NAME OF WATER SYSTEM] [or visit (INSERT YOUR WEB SITE HERE)]. The message or delivery mechanism can be modified in consultation with the State; specifically, the State may allow a separate mailing of public education materials to customers if the water system cannot place the information on water bills.

(iv) Post material meeting the content requirements of paragraph (a) of this section on the water system's Web site if the system serves a population greater than 100,000.

(v) Submit a press release to newspaper, television and radio stations.

(vi) In addition to paragraphs (b)(2)(i) through (v) of this section, systems must implement at least three activities from one or more categories listed below. The educational content and selection of these activities must be determined in consultation with the State.

(A) Public Service Announcements.

(B) Paid advertisements.

(C) Public Area Information Displays.

(D) E–mails to customers.

(E) Public Meetings.

(F) Household Deliveries.

(G) Targeted Individual Customer Contact.

(H) Direct material distribution to all multi-family homes and institutions.

(I) Other methods approved by the State.

(vii) For systems that are required to conduct monitoring annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or, if the State has established an alternate monitoring period, the last day of that period.

(3) As long as a community water system exceeds the action level, it must repeat the activities pursuant to paragraph (b)(2) of this section as described in paragraphs (b)(3)(i) through (iv) of this section.

(i) A community water system shall repeat the tasks contained in paragraphs (b)(2)(i), (ii) and (vi) of this section every 12 months.

(ii) A community water system shall repeat tasks contained in paragraph (b)(2)(iii) of this section with each billing cycle.

(iii) A community water system serving a population greater than 100,000 shall post and retain material on a publicly accessible Web site pursuant to paragraph (b)(2)(iv) of this section.

(iv) The community water system shall repeat the task in paragraph (b)(2)(v) of this section twice every 12 months on a schedule agreed upon with the State. The State can allow activities in paragraph (b)(2) of this section to extend beyond the 60–day requirement if needed for implementation purposes on a case-by-case basis; however, this extension must be approved in writing by the State in advance of the 60–day deadline.

(4) Within 60 days after the end of the monitoring period in which the exceedance occurred (unless it already is repeating public education tasks pursuant to paragraph (b)(5) of this section), a non-transient non-community water system shall deliver the public education materials specified by paragraph (a) of this section as follows:

(i) Post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system; and

(ii) Distribute informational pamphlets and/or brochures on lead in drinking water to each person served by the non-transient non-community water system. The State may allow the system to utilize electronic transmission in lieu of or combined with printed materials as long as it achieves at least the same coverage.

(iii) For systems that are required to conduct monitoring annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or, if the State has established an alternate monitoring period, the last day of that period.

(5) A non-transient non-community water system shall repeat the tasks contained in paragraph (b)(4) of this section at least once during each calendar year in which the system exceeds the lead action level. The State can allow activities in (b)(4) of this section to extend beyond the 60–day requirement if needed for implementation purposes on a case-by-case basis; however, this extension must be approved in writing by the State in advance of the 60–day deadline.

(6) A water system may discontinue delivery of public education materials if the system has met the lead action level during the most recent six-month monitoring period conducted pursuant to § 141.86. Such a system shall recommence public education in accordance with this section if it subsequently exceeds the lead action level during any monitoring period.

(7) A community water system may apply to the State, in writing (unless the State has waived the requirement for prior State approval), to use only the text specified in paragraph (a)(1) of this section in lieu of the text in paragraphs (a)(1) and (a)(2) of this section and to perform the tasks listed in paragraphs (b)(4) and (b)(5) of this section in lieu of the tasks in paragraphs (b)(2) and (b)(3) of this section if:

(i) The system is a facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices; and

(ii) The system provides water as part of the cost of services provided and does not separately charge for water consumption.

(8) A community water system serving 3,300 or fewer people may limit certain aspects of their public education programs as follows:

(i) With respect to the requirements of paragraph (b)(2)(vi) of this section, a system serving 3,300 or fewer must implement at least one of the activities listed in that paragraph.

(ii) With respect to the requirements of paragraph (b)(2)(ii) of this section, a system serving 3,300 or fewer people may limit the distribution of the public education materials required under that paragraph to facilities and organizations served by the system that are most likely to be visited regularly by pregnant women and children.

(iii) With respect to the requirements of paragraph (b)(2)(v) of this section, the State may waive this requirement for systems serving 3,300 or fewer persons as long as system distributes notices to every household served by the system.

(c) Supplemental monitoring and notification of results. A water system that fails to meet the lead action level on the basis of tap samples collected in accordance with § 141.86 shall offer to sample the tap water of any customer who requests it. The system is not required to pay for collecting or analyzing the sample, nor is the system required to collect and analyze the sample itself.

(d) Notification of results—

(1) Reporting requirement. All water systems must provide a notice of the individual tap results from lead tap water monitoring carried out under the requirements of § 141.86 to the persons served by the water system at the specific sampling site from which the sample was taken (e.g., the occupants of the residence where the tap was tested).

(2) Timing of notification. A water system must provide the consumer notice as soon as practical, but no later than 30 days after the system learns of the tap monitoring results.

(3) Content. The consumer notice must include the results of lead tap water monitoring for the tap that was tested, an explanation of the health effects of lead, list steps consumers can take to reduce exposure to lead in drinking water and contact information for the water utility. The notice must also provide the maximum contaminant level goal and the action level for lead and the definitions for these two terms from § 141.153(c).

(4) Delivery. The consumer notice must be provided to persons served at the tap that was tested, either by mail or by another method approved by the State. For example, upon approval by the State, a non-transient non-community water system could post the results on a bulletin board in the facility to allow users to review the information. The system must provide the notice to customers at sample taps tested, including consumers who do not receive water bills.

Credits
[56 FR 32113, July 15, 1991; 57 FR 28788, June 29, 1992; 65 FR 2005, Jan. 12, 2000; 69 FR 38856, June 29, 2004; 72 FR 57815, Oct. 10, 2007]

AUTHORITY: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

Current through Aug. 3, 2018; 83 FR 38243.

Code of Federal Regulations
Title 40. Protection of Environment
Chapter I. Environmental Protection Agency (Refs & Annos)
Subchapter D. Water Programs
Part 141. National Primary Drinking Water Regulations (Refs & Annos)
Subpart I. Control of Lead and Copper (Refs & Annos)

40 C.F.R. § 141.86

§ 141.86 Monitoring requirements for lead and copper in tap water.

Effective: December 10, 2007
Currentness

(a) Sample site location.

(1) By the applicable date for commencement of monitoring under paragraph (d)(1) of this section, each water system shall complete a materials evaluation of its distribution system in order to identify a pool of targeted sampling sites that meets the requirements of this section, and which is sufficiently large to ensure that the water system can collect the number of lead and copper tap samples required in paragraph (c) of this section. All sites from which first draw samples are collected shall be selected from this pool of targeted sampling sites. Sampling sites may not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic contaminants.

(2) A water system shall use the information on lead, copper, and galvanized steel that it is required to collect under § 141.42(d) of this part [special monitoring for corrosivity characteristics] when conducting a materials evaluation. When an evaluation of the information collected pursuant to § 141.42(d) is insufficient to locate the requisite number of lead and copper sampling sites that meet the targeting criteria in paragraph (a) of this section, the water system shall review the sources of information listed below in order to identify a sufficient number of sampling sites. In addition, the system shall seek to collect such information where possible in the course of its normal operations (e.g., checking service line materials when reading water meters or performing maintenance activities):

(i) All plumbing codes, permits, and records in the files of the building department(s) which indicate the plumbing materials that are installed within publicly and privately owned structures connected to the distribution system;

(ii) All inspections and records of the distribution system that indicate the material composition of the service connections that connect a structure to the distribution system; and

(iii) All existing water quality information, which includes the results of all prior analyses of the system or individual structures connected to the system, indicating locations that may be particularly susceptible to high lead or copper concentrations.

(3) The sampling sites selected for a community water system's sampling pool (“tier 1 sampling sites”) shall consist of single family structures that:

(i) Contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or

(ii) Are served by a lead service line. When multiple-family residences comprise at least 20 percent of the structures served by a water system, the system may include these types of structures in its sampling pool.

(4) Any community water system with insufficient tier 1 sampling sites shall complete its sampling pool with “tier 2 sampling sites”, consisting of buildings, including multiple-family residences that:

(i) Contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or

(ii) Are served by a lead service line.

(5) Any community water system with insufficient tier 1 and tier 2 sampling sites shall complete its sampling pool with “tier 3 sampling sites”, consisting of single family structures that contain copper pipes with lead solder installed before 1983. A community water system with insufficient tier 1, tier 2, and tier 3 sampling sites shall complete its sampling pool with representative sites throughout the distribution system. For the purpose of this paragraph, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system.

(6) The sampling sites selected for a non-transient noncommunity water system (“tier l sampling sites”) shall consist of buildings that:

(i) Contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or

(ii) Are served by a lead service line.

(7) A non-transient non-community water system with insufficient tier 1 sites that meet the targeting criteria in paragraph (a)(6) of this section shall complete its sampling pool with sampling sites that contain copper pipes with lead solder installed before 1983. If additional sites are needed to complete the sampling pool, the non-transient non-community water system shall use representative sites throughout the distribution system. For the purpose of this paragraph, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system.

(8) Any water system whose distribution system contains lead service lines shall draw 50 percent of the samples it collects during each monitoring period from sites that contain lead pipes, or copper pipes with lead solder, and 50 percent of the samples from sites served by a lead service line. A water system that cannot identify a sufficient number of sampling sites served by a lead service line shall collect first-draw samples from all of the sites identified as being served by such lines.

(b) Sample collection methods.

(1) All tap samples for lead and copper collected in accordance with this subpart, with the exception of lead service line samples collected under § 141.84(c) and samples collected under paragraph (b)(5) of this section, shall be first-draw samples.

(2) Each first-draw tap sample for lead and copper shall be one liter in volume and have stood motionless in the plumbing system of each sampling site for at least six hours. First-draw samples from residential housing shall be collected from the cold water kitchen tap or bathroom sink tap. First-draw samples from a nonresidential building shall be one liter in volume and shall be collected at an interior tap from which water is typically drawn for consumption. Non-first-draw samples collected in lieu of first-draw samples pursuant to paragraph (b)(5) of this section shall be one liter in volume and shall be collected at an interior tap from which water is typically drawn for consumption. First-draw samples may be collected by the system or the system may allow residents to collect first-draw samples after instructing the residents of the sampling procedures specified in this paragraph. To avoid problems of residents handling nitric acid, acidification of first-draw samples may be done up to 14 days after the sample is collected. After acidification to resolubilize the metals, the sample must stand in the original container for the time specified in the approved EPA method before the sample can be analyzed. If a system allows residents to perform sampling, the system may not challenge, based on alleged errors in sample collection, the accuracy of sampling results.

(3) Each service line sample shall be one liter in volume and have stood motionless in the lead service line for at least six hours. Lead service line samples shall be collected in one of the following three ways:

(i) At the tap after flushing the volume of water between the tap and the lead service line. The volume of water shall be calculated based on the interior diameter and length of the pipe between the tap and the lead service line;

(ii) Tapping directly into the lead service line; or

(iii) If the sampling site is a building constructed as a single-family residence, allowing the water to run until there is a significant change in temperature which would be indicative of water that has been standing in the lead service line.

(4) A water system shall collect each first draw tap sample from the same sampling site from which it collected a previous sample. If, for any reason, the water system cannot gain entry to a sampling site in order to collect a follow-up tap sample, the system may collect the follow-up tap sample from another sampling site in its sampling pool as long as the new site meets the same targeting criteria, and is within reasonable proximity of the original site.

(5) A non-transient non-community water system, or a community water system that meets the criteria of § 141.85(b)(7), that does not have enough taps that can supply first-draw samples, as defined in § 141.2, may apply to the State in writing to substitute non-first-draw samples. Such systems must collect as many first-draw samples from appropriate taps as possible and identify sampling times and locations that would likely result in the longest standing time for the remaining sites. The State has the discretion to waive the requirement for prior State approval of non-first-draw sample sites selected by the system, either through State regulation or written notification to the system.

(c) Number of samples. Water systems shall collect at least one sample during each monitoring period specified in paragraph (d) of this section from the number of sites listed in the first column ("standard monitoring") of the table in this paragraph. A system conducting reduced monitoring under paragraph (d)(4) of this section shall collect at least one sample from the number of sites specified in the second column ("reduced monitoring") of the table in this paragraph during each monitoring period specified in paragraph (d)(4) of this section. Such reduced monitoring sites shall be representative of the sites required for standard monitoring. A public water system that has fewer than five drinking water taps, that can be used for human consumption meeting the sample site criteria of paragraph (a) of this section to reach the required number of sample sites listed in paragraph (c) of this section, must collect at least one sample from each tap and then must collect additional samples from those taps on different days during the monitoring period to meet the required number of sites. Alternatively the State may allow these public water systems to collect a number of samples less than the number of sites specified in paragraph (c) of this section, provided that 100 percent of all taps that can be used for human consumption are sampled. The State must approve this reduction of the minimum number of samples in writing based on a request from the system or onsite verification by the State. States may specify sampling locations when a system is conducting reduced monitoring. The table is as follows:

System size (number of people served)	Number of sites (standard monitoring)	Number of sites (reduced monitoring)
>100,000	100	50
10,001 to 100,000	60	30
3,301 to 10,000	40	20
501 to 3,300	20	10
101 to 500	10	5
≤100	5	5

(d) Timing of monitoring—

(1) Initial tap sampling.

The first six-month monitoring period for small, medium-size and large systems shall begin on the following dates:

System size (No. people served)	First six-month monitoring period begins on
>50,000	January 1, 1992.
3,301 to 50,000	July 1, 1992.
≤3,300	July 1, 1993.

(i) All large systems shall monitor during two consecutive six-month periods.

(ii) All small and medium-size systems shall monitor during each six-month monitoring period until:

(A) The system exceeds the lead or copper action level and is therefore required to implement the corrosion control treatment requirements under § 141.81, in which case the system shall continue monitoring in accordance with paragraph (d)(2) of this section, or

(B) The system meets the lead and copper action levels during two consecutive six-month monitoring periods, in which case the system may reduce monitoring in accordance with paragraph (d)(4) of this section.

(2) Monitoring after installation of corrosion control and source water treatment.

(i) Any large system which installs optimal corrosion control treatment pursuant to § 141.81(d)(4) shall monitor during two consecutive six-month monitoring periods by the date specified in § 141.81(d)(5).

(ii) Any small or medium-size system which installs optimal corrosion control treatment pursuant to § 141.81(e)(5) shall monitor during two consecutive six-month monitoring periods by the date specified in § 141.81(e)(6).

(iii) Any system which installs source water treatment pursuant to § 141.83(a)(3) shall monitor during two consecutive six-month monitoring periods by the date specified in § 141.83(a)(4).

(3) Monitoring after State specifies water quality parameter values for optimal corrosion control. After the State specifies the values for water quality control parameters under § 141.82(f), the system shall monitor during each subsequent six-month monitoring period, with the first monitoring period to begin on the date the State specifies the optimal values under § 141.82(f).

(4) Reduced monitoring.

(i) A small or medium-size water system that meets the lead and copper action levels during each of two consecutive six-month monitoring periods may reduce the number of samples in accordance with paragraph (c) of this section, and reduce the frequency of sampling to once per year. A small or medium water system collecting fewer than five samples as specified in paragraph (c) of this section, that meets the lead and copper action levels during each of two consecutive six-month monitoring periods may reduce the frequency of sampling to once per year. In no case can the system reduce the number of samples required below the minimum of one sample per available tap. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month monitoring period.

(ii) Any water system that meets the lead action level and maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the State under § 141.82(f) during each of two consecutive six-month monitoring periods may reduce the frequency of monitoring to once per year and reduce the number of lead and copper samples in accordance with paragraph (c) of this section if it receives written approval from the State. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month monitoring period. The State shall review monitoring, treatment, and other relevant information submitted by the water system in accordance with § 141.90, and shall notify the system in writing when it determines the system is eligible to commence reduced monitoring pursuant to this paragraph. The State shall review, and where appropriate, revise its determination when the system submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

(iii) A small or medium-size water system that meets the lead and copper action levels during three consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three years. Any water system that meets the lead action level and maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the State under § 141.82(f) during three consecutive years of monitoring may reduce the frequency of monitoring from annually to once every three years if it receives written approval from the State. Samples collected once every three years shall be collected no later than every third calendar year. The State shall review monitoring, treatment, and other relevant information submitted by the water system in accordance with § 141.90, and shall notify the system in writing when it determines the system is eligible to reduce the frequency of monitoring to once every three years. The State shall review, and where appropriate, revise its determination when the system submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

(iv) A water system that reduces the number and frequency of sampling shall collect these samples from representative sites included in the pool of targeted sampling sites identified in paragraph (a) of this section. Systems sampling annually or less frequently shall conduct the lead and copper tap sampling during the months of June, July, August, or September unless the State has approved a different sampling period in accordance with paragraph (d)(4)(iv)(A) of this section.

(A) The State, at its discretion, may approve a different period for conducting the lead and copper tap sampling for systems collecting a reduced number of samples. Such a period shall be no longer than four consecutive months and must represent a time of normal operation where the highest levels of lead are most likely to occur. For a non-transient non-community water system that does not operate during the months of June through September, and for which the period of normal operation where the highest levels of lead are most likely to occur is not known, the State shall designate a period that represents a time of normal operation for the system. This sampling shall begin during the period approved or designated by the State in the calendar year immediately following the end of the second consecutive six-month monitoring period for systems initiating annual monitoring and during the three-year period following the end of the third consecutive calendar year of annual monitoring for systems initiating triennial monitoring.

(B) Systems monitoring annually, that have been collecting samples during the months of June through September and that receive State approval to alter their sample collection period under paragraph (d)(4)(iv)(A) of this section, must collect their next round of samples during a time period that ends no later than 21 months after the previous round of sampling. Systems monitoring triennially that have been collecting samples during the months of June through September, and receive State approval to alter the sampling collection period as per paragraph (d)(4)(iv)(A) of this section, must collect their next round of samples during a time period that ends no later than 45 months after the previous round of sampling. Subsequent rounds of sampling must be collected annually or triennially, as required by this section. Small systems with waivers, granted pursuant to paragraph (g) of this section, that have been collecting samples during the months of June through September and receive State approval to alter their sample collection period under paragraph (d)(4)(iv)(A) of this section must collect their next round of samples before the end of the 9–year period.

(v) Any water system that demonstrates for two consecutive 6–month monitoring periods that the tap water lead level computed under § 141.80(c)(3) is less than or equal to 0.005 mg/L and the tap water copper level computed under

§ 141.80(c)(3) is less than or equal to 0.65 mg/L may reduce the number of samples in accordance with paragraph (c) of this section and reduce the frequency of sampling to once every three calendar years.

(vi)(A) A small or medium-size water system subject to reduced monitoring that exceeds the lead or copper action level shall resume sampling in accordance with paragraph (d)(3) of this section and collect the number of samples specified for standard monitoring under paragraph (c) of this section. Such a system shall also conduct water quality parameter monitoring in accordance with § 141.87(b), (c) or (d) (as appropriate) during the monitoring period in which it exceeded the action level. Any such system may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in paragraph (c) of this section after it has completed two subsequent consecutive six-month rounds of monitoring that meet the criteria of paragraph (d)(4)(i) of this section and/or may resume triennial monitoring for lead and copper at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either paragraph (d)(4)(iii) or (d)(4)(v) of this section.

(B) Any water system subject to the reduced monitoring frequency that fails to meet the lead action level during any four-month monitoring period or that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the State under § 141.82(f) for more than nine days in any six-month period specified in § 141.87(d) shall conduct tap water sampling for lead and copper at the frequency specified in paragraph (d)(3) of this section, collect the number of samples specified for standard monitoring under paragraph (c) of this section, and shall resume monitoring for water quality parameters within the distribution system in accordance with § 141.87(d). This standard tap water sampling shall begin no later than the six-month period beginning January 1 of the calendar year following the lead action level exceedance or water quality parameter excursion. Such a system may resume reduced monitoring for lead and copper at the tap and for water quality parameters within the distribution system under the following conditions:

(1) The system may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in paragraph (c) of this section after it has completed two subsequent six-month rounds of monitoring that meet the criteria of paragraph (d)(4)(ii) of this section and the system has received written approval from the State that it is appropriate to resume reduced monitoring on an annual frequency. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month monitoring period.

(2) The system may resume triennial monitoring for lead and copper at the tap at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either paragraph (d)(4)(iii) or (d)(4)(v) of this section and the system has received written approval from the State that it is appropriate to resume triennial monitoring.

(3) The system may reduce the number of water quality parameter tap water samples required in accordance with § 141.87(e)(1) and the frequency with which it collects such samples in accordance with § 141.87(e)(2). Such a system may not resume triennial monitoring for water quality parameters at the tap until it demonstrates, in accordance with the requirements of § 141.87(e)(2), that it has re-qualified for triennial monitoring.

(vii) Any water system subject to a reduced monitoring frequency under paragraph (d)(4) of this section shall notify the State in writing in accordance with § 141.90(a)(3) of any upcoming long-term change in treatment or addition of a new source as described in that section. The State must review and approve the addition of a new source or long-term change in water treatment before it is implemented by the water system. The State may require the system to resume sampling in accordance with paragraph (d)(3) of this section and collect the number of samples specified for standard monitoring under paragraph (c) of this section or take other appropriate steps such as increased water quality parameter monitoring or re-evaluation of its corrosion control treatment given the potentially different water quality considerations.

(e) Additional monitoring by systems. The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the system and the State in making any determinations (i.e., calculating the 90th percentile lead or copper level) under this subpart.

(f) Invalidation of lead or copper tap water samples. A sample invalidated under this paragraph does not count toward determining lead or copper 90th percentile levels under § 141.80(c)(3) or toward meeting the minimum monitoring requirements of paragraph (c) of this section.

(1) The State may invalidate a lead or copper tap water sample at least if one of the following conditions is met.

(i) The laboratory establishes that improper sample analysis caused erroneous results.

(ii) The State determines that the sample was taken from a site that did not meet the site selection criteria of this section.

(iii) The sample container was damaged in transit.

(iv) There is substantial reason to believe that the sample was subject to tampering.

(2) The system must report the results of all samples to the State and all supporting documentation for samples the system believes should be invalidated.

(3) To invalidate a sample under paragraph (f)(1) of this section, the decision and the rationale for the decision must be documented in writing. States may not invalidate a sample solely on the grounds that a follow-up sample result is higher or lower than that of the original sample.

(4) The water system must collect replacement samples for any samples invalidated under this section if, after the invalidation of one or more samples, the system has too few samples to meet the minimum requirements of paragraph (c) of this section. Any such replacement samples must be taken as soon as possible, but no later than 20 days after the date the State invalidates the sample or by the end of the applicable monitoring period, whichever occurs later. Replacement samples taken after the end of the applicable monitoring period shall not also be used to meet the monitoring requirements of a subsequent monitoring period. The replacement samples shall be taken at the same locations as the invalidated samples or, if that is not possible, at locations other than those already used for sampling during the monitoring period.

(g) Monitoring waivers for small systems. Any small system that meets the criteria of this paragraph may apply to the State to reduce the frequency of monitoring for lead and copper under this section to once every nine years (i.e., a "full waiver") if it meets all of the materials criteria specified in paragraph (g)(1) of this section and all of the monitoring criteria specified in paragraph (g)(2) of this section. If State regulations permit, any small system that meets the criteria in paragraphs (g)(1) and (2) of this section only for lead, or only for copper, may apply to the State for a waiver to reduce the frequency of tap water monitoring to once every nine years for that contaminant only (i.e., a "partial waiver").

(1) Materials criteria. The system must demonstrate that its distribution system and service lines and all drinking water supply plumbing, including plumbing conveying drinking water within all residences and buildings connected to the system, are free of lead-containing materials and/or copper-containing materials, as those terms are defined in this paragraph, as follows:

(i) Lead. To qualify for a full waiver, or a waiver of the tap water monitoring requirements for lead (i.e., a "lead waiver"), the water system must provide certification and supporting documentation to the State that the system is free of all lead-containing materials, as follows:

(A) It contains no plastic pipes which contain lead plasticizers, or plastic service lines which contain lead plasticizers; and

(B) It is free of lead service lines, lead pipes, lead soldered pipe joints, and leaded brass or bronze alloy fittings and fixtures, unless such fittings and fixtures meet the specifications of any standard established pursuant to 42 U.S.C. 300g–6(e) (SDWA section 1417(e)).

(ii) Copper. To qualify for a full waiver, or a waiver of the tap water monitoring requirements for copper (i.e., a "copper waiver"), the water system must provide certification and supporting documentation to the State that the system contains no copper pipes or copper service lines.

(2) Monitoring criteria for waiver issuance. The system must have completed at least one 6–month round of standard tap water monitoring for lead and copper at sites approved by the State and from the number of sites required by paragraph (c) of this section and demonstrate that the 90th percentile levels for any and all rounds of monitoring conducted since the system became free of all lead-containing and/or copper-containing materials, as appropriate, meet the following criteria.

(i) Lead levels. To qualify for a full waiver, or a lead waiver, the system must demonstrate that the 90th percentile lead level does not exceed 0.005 mg/L.

(ii) Copper levels. To qualify for a full waiver, or a copper waiver, the system must demonstrate that the 90th percentile copper level does not exceed 0.65 mg/L.

(3) State approval of waiver application. The State shall notify the system of its waiver determination, in writing, setting forth the basis of its decision and any condition of the waiver. As a condition of the waiver, the State may require the system to perform specific activities (e.g., limited monitoring, periodic outreach to customers to remind

them to avoid installation of materials that might void the waiver) to avoid the risk of lead or copper concentration of concern in tap water. The small system must continue monitoring for lead and copper at the tap as required by paragraphs (d)(1) through (d)(4) of this section, as appropriate, until it receives written notification from the State that the waiver has been approved.

(4) Monitoring frequency for systems with waivers.

(i) A system with a full waiver must conduct tap water monitoring for lead and copper in accordance with paragraph (d)(4)(iv) of this section at the reduced number of sampling sites identified in paragraph (c) of this section at least once every nine years and provide the materials certification specified in paragraph (g)(1) of this section for both lead and copper to the State along with the monitoring results. Samples collected every nine years shall be collected no later than every ninth calendar year.

(ii) A system with a partial waiver must conduct tap water monitoring for the waived contaminant in accordance with paragraph (d)(4)(iv) of this section at the reduced number of sampling sites specified in paragraph (c) of this section at least once every nine years and provide the materials certification specified in paragraph (g)(1) of this section pertaining to the waived contaminant along with the monitoring results. Such a system also must continue to monitor for the non-waived contaminant in accordance with requirements of paragraph (d)(1) through (d)(4) of this section, as appropriate.

(iii) Any water system with a full or partial waiver shall notify the State in writing in accordance with § 141.90(a)(3) of any upcoming long-term change in treatment or addition of a new source, as described in that section. The State must review and approve the addition of a new source or long-term change in water treatment before it is implemented by the water system. The State has the authority to require the system to add or modify waiver conditions (e.g., require recertification that the system is free of lead-containing and/or copper-containing materials, require additional round(s) of monitoring), if it deems such modifications are necessary to address treatment or source water changes at the system.

(iv) If a system with a full or partial waiver becomes aware that it is no longer free of lead-containing or copper-containing materials, as appropriate, (e.g., as a result of new construction or repairs), the system shall notify the State in writing no later than 60 days after becoming aware of such a change.

(5) Continued eligibility. If the system continues to satisfy the requirements of paragraph (g)(4) of this section, the waiver will be renewed automatically, unless any of the conditions listed in paragraph (g)(5)(i) through (g)(5)(iii) of this section occurs. A system whose waiver has been revoked may re-apply for a waiver at such time as it again meets the appropriate materials and monitoring criteria of paragraphs (g)(1) and (g)(2) of this section.

(i) A system with a full waiver or a lead waiver no longer satisfies the materials criteria of paragraph (g)(1)(i) of this section or has a 90th percentile lead level greater than 0.005 mg/L.

(ii) A system with a full waiver or a copper waiver no longer satisfies the materials criteria of paragraph (g)(1)(ii) of this section or has a 90th percentile copper level greater than 0.65 mg/L.

(iii) The State notifies the system, in writing, that the waiver has been revoked, setting forth the basis of its decision.

(6) Requirements following waiver revocation. A system whose full or partial waiver has been revoked by the State is subject to the corrosion control treatment and lead and copper tap water monitoring requirements, as follows:

(i) If the system exceeds the lead and/or copper action level, the system must implement corrosion control treatment in accordance with the deadlines specified in § 141.81(e), and any other applicable requirements of this subpart.

(ii) If the system meets both the lead and the copper action level, the system must monitor for lead and copper at the tap no less frequently than once every three years using the reduced number of sample sites specified in paragraph (c) of this section.

(7) Pre–existing waivers. Small system waivers approved by the State in writing prior to April 11, 2000 shall remain in effect under the following conditions:

(i) If the system has demonstrated that it is both free of lead-containing and copper-containing materials, as required by paragraph (g)(1) of this section and that its 90th percentile lead levels and 90th percentile copper levels meet the criteria of paragraph (g)(2) of this section, the waiver remains in effect so long as the system continues to meet the waiver eligibility criteria of paragraph (g)(5) of this section. The first round of tap water monitoring conducted pursuant to paragraph (g)(4) of this section shall be completed no later than nine years after the last time the system has monitored for lead and copper at the tap.

(ii) If the system has met the materials criteria of paragraph (g)(1) of this section but has not met the monitoring criteria of paragraph (g)(2) of this section, the system shall conduct a round of monitoring for lead and copper at the tap demonstrating that it meets the criteria of paragraph (g)(2) of this section no later than September 30, 2000. Thereafter, the waiver shall remain in effect as long as the system meets the continued eligibility criteria of paragraph (g)(5) of this section. The first round of tap water monitoring conducted pursuant to paragraph (g)(4) of this section shall be completed no later than nine years after the round of monitoring conducted pursuant to paragraph (g)(2) of this section.

Credits

[56 FR 32113, July 15, 1991; 57 FR 28788, June 29, 1992; 65 FR 2007, Jan. 12, 2000; 72 FR 57817, Oct. 10, 2007]

AUTHORITY: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

Current through Aug. 3, 2018; 83 FR 38243.

40 C.F.R. § 141.87

§ 141.87 Monitoring requirements for water quality parameters.

Effective: December 10, 2007
Currentness

All large water systems, and all small- and medium-size systems that exceed the lead or copper action level shall monitor water quality parameters in addition to lead and copper in accordance with this section. The requirements of this section are summarized in the table at the end of this section.

(a) General requirements—

(1) Sample collection methods.

(i) Tap samples shall be representative of water quality throughout the distribution system taking into account the number of persons served, the different sources of water, the different treatment methods employed by the system, and seasonal variability. Tap sampling under this section is not required to be conducted at taps targeted for lead and copper sampling under § 141.86(a). [Note: Systems may find it convenient to conduct tap sampling for water quality parameters at sites used for coliform sampling under 40 CFR 141.21.]

(ii) Samples collected at the entry point(s) to the distribution system shall be from locations representative of each source after treatment. If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

(2) Number of samples.

(i) Systems shall collect two tap samples for applicable water quality parameters during each monitoring period specified under paragraphs (b) through (e) of this section from the following number of sites.

System size (No. people served)	No. of sites for water quality parameters
>100,000...	25
10,001-100,000...	10

3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
≤100	1

(ii) Except as provided in paragraph (c)(3) of this section, systems shall collect two samples for each applicable water quality parameter at each entry point to the distribution system during each monitoring period specified in paragraph (b) of this section. During each monitoring period specified in paragraphs (c)–(e) of this section, systems shall collect one sample for each applicable water quality parameter at each entry point to the distribution system.

(b) Initial sampling. All large water systems shall measure the applicable water quality parameters as specified below at taps and at each entry point to the distribution system during each six-month monitoring period specified in § 141.86(d)(1). All small and medium-size systems shall measure the applicable water quality parameters at the locations specified below during each six-month monitoring period specified in § 141.86(d)(1) during which the system exceeds the lead or copper action level.

(1) At taps:

(i) pH;

(ii) Alkalinity;

(iii) Orthophosphate, when an inhibitor containing a phosphate compound is used;

(iv) Silica, when an inhibitor containing a silicate compound is used;

(v) Calcium;

(vi) Conductivity; and

(vii) Water temperature.

(2) At each entry point to the distribution system: all of the applicable parameters listed in paragraph (b)(1) of this section.

(c) Monitoring after installation of corrosion control. Any large system which installs optimal corrosion control treatment pursuant to § 141.81(d)(4) shall measure the water quality parameters at the locations and frequencies specified below during each six-month monitoring period specified in § 141.86(d)(2)(i). Any small or medium-size system which installs optimal corrosion control treatment shall conduct such monitoring during each six-month monitoring period specified in § 141.86(d)(2)(ii) in which the system exceeds the lead or copper action level.

(1) At taps, two samples for:

(i) pH;

(ii) Alkalinity;

(iii) Orthophosphate, when an inhibitor containing a phosphate compound is used;

(iv) Silica, when an inhibitor containing a silicate compound is used;

(v) Calcium, when calcium carbonate stabilization is used as part of corrosion control.

(2) Except as provided in paragraph (c)(3) of this section, at each entry point to the distribution system, at least one sample no less frequently than every two weeks (biweekly) for:

(i) pH;

(ii) When alkalinity is adjusted as part of optimal corrosion control, a reading of the dosage rate of the chemical used to adjust alkalinity, and the alkalinity concentration; and

(iii) When a corrosion inhibitor is used as part of optimal corrosion control, a reading of the dosage rate of the inhibitor used, and the concentration of orthophosphate or silica (whichever is applicable).

(3) Any ground water system can limit entry point sampling described in paragraph (c)(2) of this section to those entry points that are representative of water quality and treatment conditions throughout the system. If water from untreated ground water sources mixes with water from treated ground water sources, the system must monitor for water quality parameters both at representative entry points receiving treatment and representative entry points receiving no treatment. Prior to the start of any monitoring under this paragraph, the system shall provide to the State written information identifying the selected entry points and documentation, including information on seasonal variability, sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system.

(d) Monitoring after State specifies water quality parameter values for optimal corrosion control. After the State specifies the values for applicable water quality control parameters reflecting optimal corrosion control treatment under § 141.82(f), all large systems shall measure the applicable water quality parameters in accordance with paragraph (c) of this section and determine compliance with the requirements of § 141.82(g) every six months with the first six-month period to begin on either January 1 or July 1, whichever comes first, after the State specifies the optimal values under § 141.82(f). Any small or medium-size system shall conduct such monitoring during each six-month period specified in this paragraph in which the system exceeds the lead or copper action level. For any such small and medium-size system that is subject to a reduced monitoring frequency pursuant to § 141.86(d)(4) at the time of the action level exceedance, the start of the applicable six-month monitoring period under this paragraph shall coincide with the start of the applicable monitoring period under § 141.86(d)(4). Compliance with State-designated optimal water quality parameter values shall be determined as specified under § 141.82(g).

(e) Reduced monitoring.

(1) Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment during each of two consecutive six-month monitoring periods under paragraph (d) of this section shall continue monitoring at the entry point(s) to the distribution system as specified in paragraph (c)(2) of this section. Such system may collect two tap samples for applicable water quality parameters from the following reduced number of sites during each six-month monitoring period.

System size (No. of people served)	Reduced No. of sites for water quality parameters
>100,000	10
10,001 to 100,000	7
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
≤100	1

(2)(i) Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the State under § 141.82(f) during three consecutive years of monitoring may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in this paragraph (e)(1) of this section from every six months to annually. This sampling begins during the calendar year immediately following the end of the monitoring period in which the third consecutive year of six-month monitoring occurs. Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the State under § 141.82(f), during three consecutive years of annual monitoring under this paragraph may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in paragraph (e)(1) of this section from annually to every three years. This sampling begins no later than the third calendar year following the end of the monitoring period in which the third consecutive year of monitoring occurs.

(ii) A water system may reduce the frequency with which it collects tap samples for applicable water quality parameters specified in paragraph (e)(1) of this section to every three years if it demonstrates during two consecutive monitoring periods that its tap water lead level at the 90th percentile is less than or equal to the PQL for lead specified in § 141.89 (a)(1)(ii), that its tap water copper level at the 90th percentile is less than or equal to 0.65 mg/L for copper in § 141.80(c)(2), and that it also has maintained the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the State under § 141.82(f). Monitoring conducted every three years shall be done no later than every third calendar year.

(3) A water system that conducts sampling annually shall collect these samples evenly throughout the year so as to reflect seasonal variability.

(4) Any water system subject to the reduced monitoring frequency that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the State in § 141.82(f) for more than nine days in any six-month period specified in § 141.82(g) shall resume distribution system tap water sampling in accordance with the number and frequency requirements in paragraph (d) of this section. Such a system may resume annual monitoring for water quality parameters at the tap at the reduced number of sites specified in paragraph (e)(1) of this section after it has completed two subsequent consecutive six-month rounds of monitoring that meet the criteria of that paragraph and/or may resume triennial monitoring for water quality parameters at the tap at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either paragraph (e)(2)(i) or (e)(2)(ii) of this section.

(f) Additional monitoring by systems. The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the system and the State in making any determinations (i.e., determining concentrations of water quality parameters) under this section or § 141.82.

Summary of Monitoring Requirements for Water Quality Parameters [1]

Monitoring period	Parameters [2]	Location	Frequency
Initial monitoring..................	pH, alkalinity, orthophosphate or silica [3], calcium, conductivity, temperature	Taps and at entry point(s) to distribution system...............	Every 6 months.
After installation of corrosion control..................	pH, alkalinity, orthophosphate or silica [3], calcium [4]	Taps....................................	Every 6 months.
	pH, alkalinity, dosage rate and concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual [5]	Entry point(s) to distribution system [6]	No less frequently than every two weeks.

After State specifies parameter values for optimal corrosion control..................	pH, alkalinity, orthophosphate or silica [3], calcium [4]	Taps....................................	Every 6 months.
	pH, alkalinity dosage rate and concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual [5]	Entry point(s) to distribution system [6]	No less frequently than every two weeks.
Reduced monitoring............	pH, alkalinity, orthophosphate or silica [3], calcium [4]	Taps....................................	Every 6 months, annually [7] or every 3 years [8]; reduced number of sites.
	pH, alkalinity dosage rate and concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual [5]	Entry point(s) to distribution system [6]	No less frequently than every two weeks.

Credits

[56 FR 32113, July 15, 1991; 57 FR 28788, June 29, 1992; 59 FR 33862, June 30, 1994; 65 FR 2010, Jan. 12, 2000; 72 FR 57818, Oct. 10, 2007]

AUTHORITY: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

Current through Aug. 3, 2018; 83 FR 38243.

Footnotes

1 Table is for illustrative purposes; consult the text of this section for precise regulatory requirements.

2 Small and medium-size systems have to monitor for water quality parameters only during monitoring periods in which the system exceeds the lead or copper action level.

3 Orthophosphate must be measured only when an inhibitor containing a phosphate compound is used. Silica must be measured only when an inhibitor containing silicate compound is used.

4 Calcium must be measured only when calcium carbonate stabilization is used as part of corrosion control.

5 Inhibitor dosage rates and inhibitor residual concentrations (orthophosphate or silica) must be measured only when an inhibitor is used.

6 Ground water systems may limit monitoring to representative locations throughout the system.

7 Water systems may reduce frequency of monitoring for water quality parameters at the tap from every six months to annually if they have maintained the range of values for water quality parameters reflecting optimal corrosion control during 3 consecutive years of monitoring.

8 Water systems may further reduce the frequency of monitoring for water quality parameters at the tap from annually to once every 3 years if they have maintained the range of values for water quality parameters reflecting optimal corrosion control during 3 consecutive years of annual monitoring. Water systems may accelerate to triennial monitoring for water quality parameters at the tap if they have maintained 90th percentile lead levels less than or equal to 0.005 mg/L, 90th percentile copper levels less than or equal to 0.65 mg/L, and the range of water quality parameters designated by the State under § 141.82(f) as representing optimal corrosion control during two consecutive six-month monitoring periods.

End of Document

40 C.F.R. § 141.88

§ 141.88 Monitoring requirements for lead and copper in source water.

Effective: December 10, 2007
Currentness

(a) Sample location, collection methods, and number of samples.

(1) A water system that fails to meet the lead or copper action level on the basis of tap samples collected in accordance with § 141.86 shall collect lead and copper source water samples in accordance with the following requirements regarding sample location, number of samples, and collection methods:

(i) Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). The system shall take one sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(ii) Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment (hereafter called a sampling point). The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

Note to paragraph (a)(1)(ii): For the purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources.

(iii) If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

(iv) The State may reduce the total number of samples which must be analyzed by allowing the use of compositing. Compositing of samples must be done by certified laboratory personnel. Composite samples from a maximum of five samples are allowed, provided that if the lead concentration in the composite sample is greater than or equal to 0.001 mg/L or the copper concentration is greater than or equal to 0.160 mg/L, then either:

(A) A follow-up sample shall be taken and analyzed within 14 days at each sampling point included in the composite; or

(B) If duplicates of or sufficient quantities from the original samples from each sampling point used in the composite are available, the system may use these instead of resampling.

(2) Where the results of sampling indicate an exceedance of maximum permissible source water levels established under § 141.83(b)(4), the State may require that one additional sample be collected as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point. If a State-required confirmation sample is taken for lead or copper, then the results of the initial and confirmation sample shall be averaged in determining compliance with the State-specified maximum permissible levels. Any sample value below the detection limit shall be considered to be zero. Any value above the detection limit but below the PQL shall either be considered as the measured value or be considered one-half the PQL.

(b) Monitoring frequency after system exceeds tap water action level. Any system which exceeds the lead or copper action level at the tap shall collect one source water sample from each entry point to the distribution system no later than six months after the end of the monitoring period during which the lead or copper action level was exceeded. For monitoring periods that are annual or less frequent, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or if the State has established an alternate monitoring period, the last day of that period.

(c) Monitoring frequency after installation of source water treatment. Any system which installs source water treatment pursuant to § 141.83(a)(3) shall collect an additional source water sample from each entry point to the distribution system during two consecutive six-month monitoring periods by the deadline specified in § 141.83(a)(4).

(d) Monitoring frequency after State specifies maximum permissible source water levels or determines that source water treatment is not needed.

(1) A system shall monitor at the frequency specified below in cases where the State specifies maximum permissible source water levels under § 141.83(b)(4) or determines that the system is not required to install source water treatment under § 141.83(b)(2).

(i) A water system using only groundwater shall collect samples once during the three-year compliance period (as that term is defined in § 141.2) in effect when the applicable State determination under paragraph (d)(1) of this section is made. Such systems shall collect samples once during each subsequent compliance period. Triennial samples shall be collected every third calendar year.

(ii) A water system using surface water (or a combination of surface and ground water) shall collect samples once during each calendar year, the first annual monitoring period to begin during the year in which the applicable State determination is made under paragraph (d)(1) of this section.

(2) A system is not required to conduct source water sampling for lead and/or copper if the system meets the action level for the specific contaminant in tap water samples during the entire source water sampling period applicable to the system under paragraph (d)(1) (i) or (ii) of this section.

(e) Reduced monitoring frequency.

(1) A water system using only ground water may reduce the monitoring frequency for lead and copper in source water to once during each nine-year compliance cycle (as that term is defined in § 141.2) provided that the samples are collected no later than every ninth calendar year and if the system meets one of the following criteria:

(i) The system demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the State in § 141.83(b)(4) during at least three consecutive compliance periods under paragraph (d)(1) of this section; or

(ii) The State has determined that source water treatment is not needed and the system demonstrates that, during at least three consecutive compliance periods in which sampling was conducted under paragraph (d)(1) of this section, the concentration of lead in source water was less than or equal to 0.005 mg/L and the concentration of copper in source water was less than or equal to 0.65 mg/L.

(2) A water system using surface water (or a combination of surface water and ground water) may reduce the monitoring frequency in paragraph (d)(1) of this section to once during each nine-year compliance cycle (as that term is defined in § 141.2) provided that the samples are collected no later than every ninth calendar year and if the system meets one of the following criteria:

(i) The system demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the State in § 141.83(b)(4) for at least three consecutive years; or

(ii) The State has determined that source water treatment is not needed and the system demonstrates that, during at least three consecutive years, the concentration of lead in source water was less than or equal to 0.005 mg/L and the concentration of copper in source water was less than or equal to 0.65 mg/L.

(3) A water system that uses a new source of water is not eligible for reduced monitoring for lead and/or copper until concentrations in samples collected from the new source during three consecutive monitoring periods are below the maximum permissible lead and copper concentrations specified by the State in § 141.83(a)(5).

Credits
[56 FR 32113, July 15, 1991; 57 FR 28788, 28789, June 29, 1992; 65 FR 2012, Jan. 12, 2000; 72 FR 57819, Oct. 10, 2007]

AUTHORITY: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

Current through Aug. 3, 2018; 83 FR 38243.

End of Document

40 C.F.R. § 141.89

§ 141.89 Analytical methods.

Effective: December 10, 2007
Currentness

(a) Analyses for lead, copper, pH, conductivity, calcium, alkalinity, orthophosphate, silica, and temperature shall be conducted with the methods in § 141.23(k)(1).

(1) Analyses for alkalinity, calcium, conductivity, orthophosphate, pH, silica, and temperature may be performed by any person acceptable to the State. Analyses under this section for lead and copper shall only be conducted by laboratories that have been certified by EPA or the State. To obtain certification to conduct analyses for lead and copper, laboratories must:

(i) Analyze Performance Evaluation samples, which include lead and copper, provided by or acceptable to EPA or the State at least once a year by each method for which the laboratory desires certification; and

(ii) Achieve quantitative acceptance limits as follows:

(A) For lead: ±30 percent of the actual amount in the Performance Evaluation sample when the actual amount is greater than or equal to 0.005 mg/L. The Practical Quantitation Level, or PQL for lead is 0.005 mg/L.

(B) For Copper: ±10 percent of the actual amount in the Performance Evaluation sample when the actual amount is greater than or equal to 0.050 mg/L. The Practical Quantitation Level, or PQL for copper is 0.050 mg/L.

(iii) Achieve the method detection limit for lead of 0.001 mg/L according to the procedures in appendix B of part 136 of this title. This need only be accomplished if the laboratory will be processing source water composite samples under § 141.88(a)(1)(iv).

(iv) Be currently certified by EPA or the State to perform analyses to the specifications described in paragraph (a)(1) of this section.

(2) States have the authority to allow the use of previously collected monitoring data for purposes of monitoring, if the data were collected and analyzed in accordance with the requirements of this subpart.

(3) All lead and copper levels measured between the PQL and MDL must be either reported as measured or they can be reported as one-half the PQL specified for lead and copper in paragraph (a)(1)(ii) of this section. All levels below the lead and copper MDLs must be reported as zero.

(4) All copper levels measured between the PQL and the MDL must be either reported as measured or they can be reported as one-half the PQL (0.025 mg/L). All levels below the copper MDL must be reported as zero.

(b) [Reserved]

Credits
[56 FR 32113, July 15, 1991; 57 FR 28789, June 29, 1992; 57 FR 31847, July 17, 1992; 59 FR 33863, June 30, 1994; 59 FR 62470, Dec. 5, 1994; 63 FR 47113, Sept. 3, 1998; 63 FR 72200, Dec. 31, 1998; 64 FR 67466, Dec. 1, 1999; 65 FR 2012, Jan. 12, 2000; 72 FR 57819, Oct. 10, 2007]

AUTHORITY: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

Current through Aug. 3, 2018; 83 FR 38243.

End of Document

Code of Federal Regulations
Title 40. Protection of Environment
Chapter I. Environmental Protection Agency (Refs & Annos)
Subchapter D. Water Programs
Part 141. National Primary Drinking Water Regulations (Refs & Annos)
Subpart I. Control of Lead and Copper (Refs & Annos)

40 C.F.R. § 141.90

§ 141.90 Reporting requirements.

Effective: December 10, 2007
Currentness

All water systems shall report all of the following information to the State in accordance with this section.

(a) Reporting requirements for tap water monitoring for lead and copper and for water quality parameter monitoring.

(1) Except as provided in paragraph (a)(1)(viii) of this section, a water system shall report the information specified below for all tap water samples specified in § 141.86 and for all water quality parameter samples specified in § 141.87 within the first 10 days following the end of each applicable monitoring period specified in § 141.86 and § 141.87 (i.e., every six months, annually, every 3 years, or every 9 years). For monitoring periods with a duration less than six months, the end of the monitoring period is the last date samples can be collected during that period as specified in §§ 141.86 and 141.87.

(i) The results of all tap samples for lead and copper including the location of each site and the criteria under § 141.86(a)(3), (4), (5), (6), and/or (7) under which the site was selected for the system's sampling pool;

(ii) Documentation for each tap water lead or copper sample for which the water system requests invalidation pursuant to § 141.86(f)(2);

(iii) [Reserved]

(iv) The 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each monitoring period (calculated in accordance with § 141.80(c)(3)), unless the State calculates the system's 90th percentile lead and copper levels under paragraph (h) of this section;

(v) With the exception of initial tap sampling conducted pursuant to § 141.86(d)(1), the system shall designate any site which was not sampled during previous monitoring periods, and include an explanation of why sampling sites have changed;

(vi) The results of all tap samples for pH, and where applicable, alkalinity, calcium, conductivity, temperature, and orthophosphate or silica collected under § 141.87(b)–(e);

(vii) The results of all samples collected at the entry point(s) to the distribution system for applicable water quality parameters under § 141.87(b)–(e);

(viii) A water system shall report the results of all water quality parameter samples collected under § 141.87(c) through (f) during each six-month monitoring period specified in § 141.87(d) within the first 10 days following the end of the monitoring period unless the State has specified a more frequent reporting requirement.

(2) For a non-transient non-community water system, or a community water system meeting the criteria of § 141.85(b)(7), that does not have enough taps that can provide first-draw samples, the system must either:

(i) Provide written documentation to the State identifying standing times and locations for enough non-first-draw samples to make up its sampling pool under § 141.86(b)(5) by the start of the first applicable monitoring period under § 141.86(d) that commences after April 11, 2000, unless the State has waived prior State approval of non-first-draw sample sites selected by the system pursuant to § 141.86(b)(5); or

(ii) If the State has waived prior approval of non-first-draw sample sites selected by the system, identify, in writing, each site that did not meet the six-hour minimum standing time and the length of standing time for that particular substitute sample collected pursuant to § 141.86(b)(5) and include this information with the lead and copper tap sample results required to be submitted pursuant to paragraph (a)(1)(i) of this section.

(3) At a time specified by the State, or if no specific time is designated by the State, then as early as possible prior to the addition of a new source or any long-term change in water treatment, a water system deemed to have optimized corrosion control under § 141.81(b)(3), a water system subject to reduced monitoring pursuant to § 141.86(d)(4), or a water system subject to a monitoring waiver pursuant to § 141.86(g), shall submit written documentation to the State describing the change or addition. The State must review and approve the addition of a new source or long-term change in treatment before it is implemented by the water system. Examples of long-term treatment changes include the addition of a new treatment process or modification of an existing treatment process. Examples of modifications include switching secondary disinfectants, switching coagulants (e.g., alum to ferric chloride), and switching corrosion inhibitor products (e.g., orthophosphate to blended phosphate). Long-term changes can include dose changes to existing chemicals if the system is planning long-term changes to its finished water pH or residual inhibitor concentration. Long-term treatment changes would not include chemical dose fluctuations associated with daily raw water quality changes.

(4) Any small system applying for a monitoring waiver under § 141.86(g), or subject to a waiver granted pursuant to § 141.86(g)(3), shall provide the following information to the State in writing by the specified deadline:

(i) By the start of the first applicable monitoring period in § 141.86(d), any small water system applying for a monitoring waiver shall provide the documentation required to demonstrate that it meets the waiver criteria of §§ 141.86(g)(1) and (2).

(ii) No later than nine years after the monitoring previously conducted pursuant to § 141.86(g)(2) or § 141.86(g)(4)(i), each small system desiring to maintain its monitoring waiver shall provide the information required by §§ 141.86(g)(4)(i) and (ii).

(iii) No later than 60 days after it becomes aware that it is no longer free of lead-containing and/or copper-containing material, as appropriate, each small system with a monitoring waiver shall provide written notification to the State, setting forth the circumstances resulting in the lead-containing and/or copper-containing materials being introduced into the system and what corrective action, if any, the system plans to remove these materials.

(iv) By October 10, 2000, any small system with a waiver granted prior to April 11, 2000 and that has not previously met the requirements of § 141.86(g)(2) shall provide the information required by that paragraph.

(5) Each ground water system that limits water quality parameter monitoring to a subset of entry points under § 141.87(c)(3) shall provide, by the commencement of such monitoring, written correspondence to the State that identifies the selected entry points and includes information sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system.

(b) Source water monitoring reporting requirements.

(1) A water system shall report the sampling results for all source water samples collected in accordance with § 141.88 within the first 10 days following the end of each source water monitoring period (i.e., annually, per compliance period, per compliance cycle) specified in § 141.88.

(2) With the exception of the first round of source water sampling conducted pursuant to § 141.88(b), the system shall specify any site which was not sampled during previous monitoring periods, and include an explanation of why the sampling point has changed.

(c) Corrosion control treatment reporting requirements. By the applicable dates under § 141.81, systems shall report the following information:

(1) For systems demonstrating that they have already optimized corrosion control, information required in § 141.81(b) (2) or (3).

(2) For systems required to optimize corrosion control, their recommendation regarding optimal corrosion control treatment under § 141.82(a).

(3) For systems required to evaluate the effectiveness of corrosion control treatments under § 141.82(c), the information required by that paragraph.

(4) For systems required to install optimal corrosion control designated by the State under § 141.82(d), a letter certifying that the system has completed installing that treatment.

(d) Source water treatment reporting requirements. By the applicable dates in § 141.83, systems shall provide the following information to the State:

(1) If required under § 141.83(b)(1), their recommendation regarding source water treatment;

(2) For systems required to install source water treatment under § 141.83(b)(2), a letter certifying that the system has completed installing the treatment designated by the State within 24 months after the State designated the treatment.

(e) Lead service line replacement reporting requirements. Systems shall report the following information to the State to demonstrate compliance with the requirements of § 141.84:

(1) No later than 12 months after the end of a monitoring period in which a system exceeds the lead action level in sampling referred to in § 141.84(a), the system must submit written documentation to the State of the material evaluation conducted as required in § 141.86(a), identify the initial number of lead service lines in its distribution system at the time the system exceeds the lead action level, and provide the system's schedule for annually replacing at least 7 percent of the initial number of lead service lines in its distribution system.

(2) No later than 12 months after the end of a monitoring period in which a system exceeds the lead action level in sampling referred to in § 141.84(a), and every 12 months thereafter, the system shall demonstrate to the State in writing that the system has either:

(i) Replaced in the previous 12 months at least 7 percent of the initial lead service lines (or a greater number of lines specified by the State under § 141.84(e)) in its distribution system, or

(ii) Conducted sampling which demonstrates that the lead concentration in all service line samples from an individual line(s), taken pursuant to § 141.86(b)(3), is less than or equal to 0.015 mg/L. In such cases, the total number of lines replaced and/or which meet the criteria in § 141.84(c) shall equal at least 7 percent of the initial number of lead lines identified under paragraph (e)(1) of this section (or the percentage specified by the State under § 141.84(e)).

(3) The annual letter submitted to the State under paragraph (e)(2) of this section shall contain the following information:

(i) The number of lead service lines scheduled to be replaced during the previous year of the system's replacement schedule;

(ii) The number and location of each lead service line replaced during the previous year of the system's replacement schedule;

(iii) If measured, the water lead concentration and location of each lead service line sampled, the sampling method, and the date of sampling.

(4) Any system which collects lead service line samples following partial lead service line replacement required by § 141.84 shall report the results to the State within the first ten days of the month following the month in which the system receives the laboratory results, or as specified by the State. States, at their discretion may eliminate this requirement to report these monitoring results. Systems shall also report any additional information as specified by the State, and in a time and manner prescribed by the State, to verify that all partial lead service line replacement activities have taken place.

(f) Public education program reporting requirements.

(1) Any water system that is subject to the public education requirements in § 141.85 shall, within ten days after the end of each period in which the system is required to perform public education in accordance with § 141.85(b), send written documentation to the State that contains:

(i) A demonstration that the system has delivered the public education materials that meet the content requirements in § 141.85(a) and the delivery requirements in § 141.85(b); and

(ii) A list of all the newspapers, radio stations, television stations, and facilities and organizations to which the system delivered public education materials during the period in which the system was required to perform public education tasks.

(2) Unless required by the State, a system that previously has submitted the information required by paragraph (f)(1)(ii) of this section need not resubmit the information required by paragraph (f)(1)(ii) of this section, as long as there have been no changes in the distribution list and the system certifies that the public education materials were distributed to the same list submitted previously.

(3) No later than 3 months following the end of the monitoring period, each system must mail a sample copy of the consumer notification of tap results to the State along with a certification that the notification has been distributed in a manner consistent with the requirements of § 141.85(d).

(g) Reporting of additional monitoring data. Any system which collects sampling data in addition to that required by this subpart shall report the results to the State within the first ten days following the end of the applicable monitoring period under §§ 141.86, 141.87 and 141.88 during which the samples are collected.

(h) Reporting of 90th percentile lead and copper concentrations where the State calculates a system's 90th percentile concentrations. A water system is not required to report the 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each monitoring period, as required by paragraph (a)(1)(iv) of this section if:

(1) The State has previously notified the water system that it will calculate the water system's 90th percentile lead and copper concentrations, based on the lead and copper tap results submitted pursuant to paragraph (h)(2)(i) of

this section, and has specified a date before the end of the applicable monitoring period by which the system must provide the results of lead and copper tap water samples;

(2) The system has provided the following information to the State by the date specified in paragraph (h)(1) of this section:

(i) The results of all tap samples for lead and copper including the location of each site and the criteria under § 141.86(a)(3), (4), (5), (6), and/or (7) under which the site was selected for the system's sampling pool, pursuant to paragraph (a)(1)(i) of this section; and

(ii) An identification of sampling sites utilized during the current monitoring period that were not sampled during previous monitoring periods, and an explanation why sampling sites have changed; and

(3) The State has provided the results of the 90th percentile lead and copper calculations, in writing, to the water system before the end of the monitoring period.

Credits

[56 FR 32113, July 15, 1991; 57 FR 28789, June 29, 1992; 59 FR 33864, June 30, 1994; 65 FR 2012, Jan. 12, 2000; 72 FR 57819, Oct. 10, 2007]

AUTHORITY: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

Current through Aug. 3, 2018; 83 FR 38243.

End of Document

Code of Federal Regulations
Title 40. Protection of Environment
Chapter I. Environmental Protection Agency (Refs & Annos)
Subchapter D. Water Programs
Part 141. National Primary Drinking Water Regulations (Refs & Annos)
Subpart I. Control of Lead and Copper (Refs & Annos)

40 C.F.R. § 141.91

§ 141.91 Recordkeeping requirements.

Currentness

Any system subject to the requirements of this subpart shall retain on its premises original records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, State determinations, and any other information required by §§ 141.81 through 141.88. Each water system shall retain the records required by this section for no fewer than 12 years.

Credits
[56 FR 32113, July 15, 1991]

AUTHORITY: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

Current through Aug. 3, 2018; 83 FR 38243.

ATTACHMENT

2

Barclays Official California Code of Regulations Currentness
Title 22. Social Security
Division 4. Environmental Health
Chapter 17.5. Lead and Copper
Article 1. General Requirements and Definitions

22 CCR § 64670

§ 64670. General Requirements.

(a) Unless otherwise indicated, the requirements in this chapter apply to community water systems and nontransient-noncommunity water systems (hereinafter referred to as "water systems" or "systems").

(b) An action level exceedance shall not constitute a violation of this chapter.

(c) Analyses for lead, copper, pH, conductivity, calcium, alkalinity, orthophosphate, silica, and temperature shall be conducted using the methods prescribed at 40 Code of Federal Regulations, Section 141.89 [Federal Register (FR) 56 (110), 26460-26564, June 7, 1991; amended July 15, 1991 (56 FR 32113), June 29, 1992 (57 FR 28786), June 30, 1994 (59 FR 33860), and January 12, 2000 (65 FR 1250)]. Field tests shall be performed by water treatment or distribution operators certified by the Department pursuant to Section 106875 of the Health and Safety Code or by personnel trained to perform these tests by the Department, a certified laboratory, or certified operator.

(d) A new water system shall initiate compliance with this chapter within six months of distributing water to consumers. An existing system that changes size pursuant to the definitions in sections 64671.30, 64671.40 and 64671.70, shall initiate compliance with the requirements of this chapter applicable to the new size within six months.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New chapter 17.5, article 1 and section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer of chapter 17.5 (articles 1-9, sections 64670-64692), article 1 (sections 64670-64672.6) and section and new chapter 17.5 (articles 1-9, sections 64670-64690.80), article 1 (sections 64670-64671.85) and section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

This database is current through 7/20/18 Register 2018, No. 29

22 CCR § 64670, 22 CA ADC § 64670

End of Document

Barclays Official California Code of Regulations Currentness
Title 22. Social Security
Division 4. Environmental Health
Chapter 17.5. Lead and Copper
Article 1. General Requirements and Definitions

22 CCR § 64671.05

§ 64671.05. Action Level.

"Action level", for the purpose of this chapter only, means the concentration of lead or copper in water that is used to determine the requirements of this chapter that a system shall meet.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

This database is current through 7/20/18 Register 2018, No. 29

22 CCR § 64671.05, 22 CA ADC § 64671.05

End of Document

22 CCR § 64671.08

§ 64671.08. Action Level Exceedance.

“Action level exceedance”, for the purpose of this chapter only, means that the level of lead or copper is greater than the respective action level, as determined pursuant to section 64678(d) through (g).

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

This database is current through 7/20/18 Register 2018, No. 29

22 CCR § 64671.08, 22 CA ADC § 64671.08

End of Document

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Title 22. Social Security
Division 4. Environmental Health
Chapter 17.5. Lead and Copper
Article 1. General Requirements and Definitions

22 CCR § 64671.09

§ 64671.09. Corrosion Control Treatment or CCT.

"Corrosion control treatment" or "CCT" means the corrosion control treatment that minimizes the lead and copper concentrations at users' taps without causing the water system to violate any primary drinking water standards.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

This database is current through 7/20/18 Register 2018, No. 29

22 CCR § 64671.09, 22 CA ADC § 64671.09

Barclays Official California Code of Regulations Currentness
Title 22. Social Security
Division 4. Environmental Health
Chapter 17.5. Lead and Copper
Article 1. General Requirements and Definitions

22 CCR § 64671.10

§ 64671.10. Corrosion Inhibitor.

"Corrosion inhibitor" means a substance capable of reducing the corrosivity of water toward metal plumbing materials, especially lead and copper, by forming a protective film on the interior surface of those materials.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

This database is current through 7/20/18 Register 2018, No. 29

22 CCR § 64671.10, 22 CA ADC § 64671.10

End of Document

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Title 22. Social Security
Division 4. Environmental Health
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Article 1. General Requirements and Definitions

22 CCR § 64671.15

§ 64671.15. Detection Limit for Purposes of Reporting or DLR.

"Detection limit for purposes of reporting" or "DLR" means the designated minimum level at or above which any analytical finding of a contaminant in drinking water resulting from monitoring required under this chapter shall be reported to the Department.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64671.15, 22 CA ADC § 64671.15

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22 CCR § 64671.20

§ 64671.20. Effective Corrosion Inhibitor Residual.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116300-116750, Health and Safety Code; and 40 Code of Federal Regulations 141.2.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order, including amendment of Note, transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64671.20, 22 CA ADC § 64671.20

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22 CCR § 64671.25

§ 64671.25. First Draw Sample.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116300-116750, Health and Safety Code; and 40 Code of Federal Regulations 141.2.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Editorial correction of Note(Register 96, No. 38).

4. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

5. Repealer filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64671.25, 22 CA ADC § 64671.25

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22 CCR § 64671.30

§ 64671.30. Large Water System.

“Large water system”, for the purpose of this chapter only, means a water system that serves more than 50,000 persons.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Editorial correction of Note(Register 96, No. 38).

4. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

5. Repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64671.30, 22 CA ADC § 64671.30

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22 CCR § 64671.35

§ 64671.35. Lead Service Line.

"Lead service line" means a service line made of lead that connects the water main to the building inlet and any lead pigtail, gooseneck or other fitting which is connected to such lead line.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Editorial correction of Note(Register 96, No. 38).

4. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

5. Repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64671.35, 22 CA ADC § 64671.35

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22 CCR § 64671.40

§ 64671.40. Medium-Size Water System.

"Medium-size water system", for the purpose of this chapter only, means a water system that serves greater than 3,300 and less than or equal to 50,000 persons.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Editorial correction of Note(Register 96, No. 38).

4. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

5. Repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64671.40, 22 CA ADC § 64671.40

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22 CCR § 64671.50

§ 64671.50. Optimal Corrosion Control Treatment.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116300 through 116750, Health and Safety Code; and 40 Code of Federal Regulations 141.2.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Editorial correction of Note(Register 96, No. 38).

4. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

5. Repealer filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64671.50, 22 CA ADC § 64671.50

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22 CCR § 64671.55

§ 64671.55. Period.

"Period", for the purpose of this chapter only, means a six-month monitoring timeframe.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64671.55, 22 CA ADC § 64671.55

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22 CCR § 64671.60

§ 64671.60. Service Line Sample.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116300 through 116750, Health and Safety Code; and 40 Code of Federal Regulations 141.2.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Editorial correction of Note(Register 96, No. 38).

4. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

5. Repealer filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64671.60, 22 CA ADC § 64671.60

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22 CCR § 64671.65

§ 64671.65. Single-Family Structure.

"Single-family structure" means a building constructed as a single-family residence that is currently used as either a residence or a place of business.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Editorial correction of Note(Register 96, No. 38).

4. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

5. Repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64671.65, 22 CA ADC § 64671.65

22 CCR § 64671.70

§ 64671.70. Small Water System.

"Small water system", for the purpose of this chapter only, means a water system that serves 3,300 persons or fewer.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Editorial correction of Note(Register 96, No. 38).

4. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

5. Repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64671.70, 22 CA ADC § 64671.70

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22 CCR § 64671.75

§ 64671.75. Tap Sampling.

"Tap sampling" means sampling conducted pursuant to sections 64675 (General Requirements for Tap Sampling for Lead and Copper), 64675.5 (Tap Sampling Frequency), and 64677 (Sampling Collection Methods for Taps) at sites selected pursuant to section 64676 (Sampling Site Selection).

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64671.75, 22 CA ADC § 64671.75

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22 CCR § 64671.80

§ 64671.80. Water Quality Parameter or WQP.

"Water quality parameter" or "WQP", for the purposes of this chapter, means a characteristic or constituent of water, or a water treatment chemical added to water to control corrosion.

Note: Authority cited: Sections 116350, 116375, 131052 and 131200, Health and Safety Code. Reference: Sections 116275 and 116350, Health and Safety Code.

HISTORY

1. New section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

2. Amendment of section and Note filed 5-28-2014; operative 7-1-2014 (Register 2014, No. 22).

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22 CCR § 64671.80, 22 CA ADC § 64671.80

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22 CCR § 64671.85

§ 64671.85. WQP Monitoring.

"WQP monitoring" means sampling conducted pursuant to sections 64680 (General WQP Monitoring Requirements), 64681 (Initial WQP Monitoring), and 64682 (WQP Monitoring Requirements after CCT Installation).

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64671.85, 22 CA ADC § 64671.85

End of Document

22 CCR § 64672

§ 64672. Analytical Methods and Detection Limits.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116300 through 116750, Health and Safety Code; and 40 Code of Federal Regulations 141.89.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order, including new subsections (c)-(d), transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64672, 22 CA ADC § 64672

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22 CCR § 64672.3

§ 64672.3. Determination of Compliance with Lead and Copper Action Levels.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116300 through 116750, Health and Safety Code; and 40 Code of Federal Regulations 141.80(c).

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64672.3, 22 CA ADC § 64672.3

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22 CCR § 64672.6

§ 64672.6. Use of Information Developed Prior to December 1, 1995.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116300 through 116750, Health and Safety Code; and 40 Code of Federal Regulations 141.81(d) and (e).

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order, including amendment of subsections (c)(2)-(3), transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64672.6, 22 CA ADC § 64672.6

End of Document

22 CCR § 64673

§ 64673. Small and Medium-Size Water System Requirements.

(a) The requirements in this section are applicable to all small and medium-size water systems.

(b) Each small and medium-size system shall conduct standard tap sampling for lead and copper pursuant to section 64675 (General Requirements for Tap Sampling for Lead and Copper). Tap sampling frequency may be reduced pursuant to section 64675.5 (Tap Sampling Frequency).

(c) A small or medium-size system with an action level exceedance shall take the following steps:

(1) Monitor WQPs beginning with the first period after the exceedance, pursuant to section 64681 (Initial WQP Monitoring).

(2) Proceed with subparagraphs (A) through (E) if a corrosion control study is required by the Department based on a review of the system's water quality, distribution system, water treatment, and system features. If such a study is required, the Department will notify the system in writing within 12 months of the action level exceedance.

(A) Complete the study, pursuant to section 64683 (Corrosion Control Study Procedure), within eighteen months of being notified of the requirement; the system will be notified of the Department's designation within six months of the study's completion;

(B) Begin installation of the CCT designated by the Department, pursuant to section 64684 (CCT Installation and Operation), within twelve months of being notified of the Department's designation;

(C) Complete CCT installation and begin operation within 24 months of the designation;

(D) Complete two periods of standard tap sampling pursuant to section 64675 (General Requirements for Tap Sampling for Lead and Copper) and two periods of WQP monitoring pursuant to section 64682 (WQP Monitoring After CCT Installation) within 36 months of the designation; and

(E) Monitor WQPs and operate in compliance with the WQP levels specified by the Department pursuant to section 64684 (CCT Installation and Operation), beginning no later than within 42 months of the designation.

(3) If the Department does not require a corrosion control study, the system shall submit to the Department, within six months of the action level exceedance, a written recommendation for CCT. The Department may require the system to conduct additional WQP monitoring to assist in the review of the CCT recommendation. The Department will designate CCT and notify the system in writing within the following timeframes; the system shall then comply with paragraphs (2)(B) through (E):

(A) For medium-size systems, within 12 months of the exceedance, and

(B) For small-size systems, within 18 months of the exceedance;

(4) Monitor source waters, pursuant to article 6 (Source Water Requirements for Action Level Exceedances) of this chapter;

(d) A small or medium-size system with an action level exceedance for lead shall:

(1) Complete a lead public education program, pursuant to article 7 (Public Education Program for Lead Action Level Exceedances) of this chapter; and

(2) Replace lead service lines, pursuant to article 8 (Lead Service Line Requirements for Action Level Exceedances) of this chapter.

(e) A small or medium-size system that is required to comply with subsections (c) or (d) may cease completing the steps whenever the system does not have an action level exceedance during each of two consecutive periods. If any such system thereafter has an exceedance during any period, the system shall:

(1) Resume completion of the applicable steps, beginning with the first step that was not previously completed. The Department may require a system to repeat steps previously completed if the Department determines that this is necessary to implement the requirements of this section, based on a review of the system's data and treatment status.

(2) Resume standard tap sampling pursuant to 64675 (General Requirements for Tap Sampling for Lead and Copper).

(3) Conduct WQP monitoring during the period in which the system exceeded the action level, pursuant to section 64682, (WQP Monitoring After CCT Installation) or 64684 (CCT Installation and Operation).

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New article 2 and section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Editorial correction of subsection (b)(2)(B) (Register 96, No. 38).

4. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

5. Repealer of article 2 (sections 64673-64676), new article 2 (sections 64673-64674) and repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64673, 22 CA ADC § 64673

End of Document

22 CCR § 64674

§ 64674. Large Water System Requirements.

(a) The requirements in this section are applicable to all large water systems.

(b) Each large system shall conduct standard tap sampling pursuant to section 64675 (General Requirements for Tap Sampling for Lead and Copper), and monitor for WQPs pursuant to section 64681 (Initial WQP Monitoring). Tap sampling frequency may be reduced pursuant to section 64675.5 (Tap Sampling Frequency).

(c) Each large system shall complete a corrosion control study, pursuant to section 64683 (Corrosion Control Study Procedure), unless it can meet one of the following criteria:

(1) The system submits the following documentation to the Department and the Department determines in writing that the system has optimized corrosion control based on its review of the submittal:

(A) The results of all test samples collected for each of the WQPs in section 64683(a)(3) (Corrosion Control Study Procedure);

(B) A report explaining the test methods used by the water system to evaluate corrosion control treatment alternatives pursuant to section 64683 (Corrosion Control Study Procedure), the results of all tests conducted, and the basis for the system's selection of CCT;

(C) A report explaining how CCT has been installed and is being operated pursuant to section 64684 (CCT Installation and Operation); and

(D) The results of tap sampling for lead and copper for two consecutive periods after corrosion control has been installed; or

(2) The system demonstrates for two consecutive periods that the difference between the 90th percentile tap sampling lead level and the highest source water monitoring result for each period is less than the reporting level for purposes of reporting (DLR), pursuant to subsections 64678 (a), (b) and (c) (Determination of Exceedances of Lead and Copper Action Levels), or that the source water lead levels are below the method detection level of 0.001 mg/L and the 90th percentile lead level is equal to or less than the DLR for each period. In either case, the system shall also not have a copper action level exceedance. If such a system ceases to meet this criteria, it shall conduct a corrosion control

study, pursuant to section 64683 (Corrosion Control Study Procedure) within eighteen months of not meeting the criteria, and proceed thereafter pursuant to subsection (e).

(d) Each large system that conducts a corrosion control study will be notified of the Department's designation for CCT within 6 months of the study's completion and shall comply with the following timeframes:

(1) Begin CCT installation within 12 months of being notified of the Department's designation for CCT.

(2) Complete CCT installation within 24 months of the Department's designation.

(3) Complete two periods of WQP monitoring and tap sampling for lead and copper within 36 months of the Department's designation.

(4) Operate in compliance with the WQP levels specified by the Department pursuant to section 64684 (CCT Installation and Operation), beginning no later than within 42 months of the Department's designation. WQP tap monitoring may be reduced as follows:

(A) Pursuant to section 64682(c) (WQP Monitoring After CCT Installation), if the system has no action level exceedance; or

(B) To once every three years at the reduced number of sites pursuant to table 64680-A, if the system has 90th percentile levels that do not exceed 0.005 mg/L for lead and 0.65 mg/L for copper for two consecutive periods.

(5) If source water treatment has been installed, conduct source sampling for lead and copper pursuant to section 64685 (Source Water Monitoring and Treatment Designation).

(e) A large system with an action level exceedance for lead shall:

(1) Monitor source waters, pursuant to article 6 (Source Water Requirements) of this chapter;

(2) Complete a lead public education program, pursuant to article 7 (Public Education Program for Action Level Exceedances) of this chapter; and

(3) Replace lead service lines, pursuant to article 8 (Lead Service Line Requirements) of this chapter.

(f) A large system with an action level exceedance for copper shall monitor source waters pursuant to article 6 (Source Water Requirements) of this chapter.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order, including amendment of subsections (a)(2) and (a)(4)-(6), transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64674, 22 CA ADC § 64674

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22 CCR § 64675

§ 64675. General Requirements for Tap Sampling for Lead and Copper.

(a) During each period, each system shall conduct standard tap sampling by collecting one sample from the number of sites based on the number of people served specified in table 64675-A under Standard Tap Sampling.

(b) During each period, each system conducting reduced tap sampling shall collect at least one sample from the number of sites based on the number of people served specified in table 64675-A under Reduced Tap Sampling, as follows:

(1) The sites shall be representative of the sites required for standard tap sampling.

(2) The samples shall be collected during the months of June, July, August, or September, unless the Department approves an alternate set of four months based on a review of the system's operations and lead and copper data, in which case the system shall initiate sampling during the alternate set of four months when directed in writing to do so by the Department, as follows:

(A) No later than 21 months after the previous period, if sampling annually, or

(B) No later than 45 months after the previous period, if sampling triennially.

Table 64675-A Lead and Copper Tap Sampling Sites

System Size	Standard Tap Sampling	Reduced Tap Sampling
	(Minimimum Number of Sites)	
>100,000	100	50
10,001 to 100,000	60	30
3,301 to 10,000	40	20
501 to 3,300	20	10
101 to 500	10	5
<101	5	5

Lead and Copper Tap Sampling Sites

System Size	*Standard Tap Sampling*	*Reduced Tap Sampling*
	(Minimimum Number of Sites)	
>100,000	100	50
10,001 to 100,000	60	30
3,301 to 10,000	40	20
501 to 3,300	20	10
101 to 500	10	5
<101	5	5

(c) Sample sites shall be selected pursuant to section 64676 (Sample Site Selection).

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order, including amendment of subsection (a)(1), transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer of article 3 (sections 64677-64678), new article 3 (sections 64675-64679) and repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64675, 22 CA ADC § 64675

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22 CCR § 64675.5

§ 64675.5. Tap Sampling Frequency.

(a) A system shall conduct standard tap sampling for two consecutive periods; thereafter, tap sampling frequency may be reduced pursuant to section 64675 (General Requirements for Tap Sampling for Lead and Copper) as follows:

(1) If a system has 90th percentile levels that do not exceed 0.005 mg/L for lead and 0.65 mg/L for copper for two consecutive periods, it may reduce the sampling to once every three years at the reduced number of sites;

(2) For systems that do not meet the criteria in paragraph (1), after two consecutive periods with no action level exceedance, the frequency may be reduced to annually at the reduced number of sites, if the system receives written approval from the Department based on its review of the system's data. After sampling for three years (including the initial sampling year) with no action level exceedance, the frequency may be reduced to once every three years at the reduced number of sites, if the system receives written approval from the Department.

(b) If a system demonstrates for two consecutive periods that the difference between the 90th percentile tap sampling lead level and the highest source water monitoring result for each period is less than the reporting level for purposes of reporting (DLR), pursuant to subsections 64678(a), (b), and (c) or that the source water lead levels are below the method detection level of 0.001 mg/L and the 90th percentile lead level is equal to or less than the DLR for each period, the system shall conduct tap sampling once every three years.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64675.5, 22 CA ADC § 64675.5

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22 CCR § 64676

§ 64676. Sample Site Selection.

(a) Each system shall identify a pool of sampling sites that:

(1) Is large enough to ensure that the water system can collect the number of lead and copper tap samples required in section 64675 (General Requirements for Tap Sampling for Lead and Copper);

(2) Meets the criteria in subsections (c) or (d), as applicable; and

(3) Does not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic contaminants.

(b) Prior to identifying sampling sites, each system shall conduct an evaluation of its distribution system to determine the construction materials (lead, copper, and galvanized steel) exposed to the water. If necessary to ensure the sample site criteria is met, the system shall collect additional information during the course of its normal operations (e.g., checking service line materials when reading water meters, or performance maintenance activities) and from the following:

(1) All plumbing codes, permits, and records in the files of the building department(s) that indicate the plumbing materials installed within publicly and privately owned structures connected to the distribution system;

(2) All inspections and records of the distribution system that indicate the material composition of the service connections connecting a structure to the distribution system; and

(3) All existing water quality information, which includes the results of prior analyses of the system or individual structures connected to the system, indicating locations that may be particularly susceptible to high lead or copper concentrations.

(c) Each community water system shall:

(1) Identify a sampling pool of "tier 1" sampling sites consisting of single-family structures except that, when multiple-family residences comprise at least 20 percent of the structures served by a water system, the system may include these types of structures as "tier 1" sites in its sampling pool. The "tier 1" sampling sites shall

(A) Contain copper pipes with lead solder installed after 1982; or

(B) Contain lead pipes; or

(C) Be served by a lead service line.

(2) If there is an insufficient number of "tier 1" sites, complete its sampling pool with "tier 2" sampling sites, consisting of buildings, including multiple-family residences that:

(A) Contain copper pipes with lead solder installed after 1982; or

(B) Contain lead pipes; or

(C) Are served by a lead service line.

(3) If there is an insufficient number of "tier 1" and "tier 2" sampling sites, complete its sampling pool with "tier 3" sampling sites, consisting of single-family structures that contain copper pipes with lead solder installed before 1983. A system with an insufficient number of tier 1, 2 and 3 sites shall complete its sampling pool with representative sites (i.e., plumbing materials commonly found at other sites) throughout the distribution system.

(d) Each nontransient-noncommunity water system shall:

(1) Identify a pool of "tier 1" sampling sites consisting of buildings that:

(A) Contain copper pipes with lead solder installed after 1982; or

(B) Contain lead pipes; or

(C) Are served by a lead service line.

(2) If there is an insufficient number of "tier 1" sites that meet the criteria in paragraph (1), complete its sampling pool with sites that contain copper pipes with lead solder installed before 1983. If additional sites are needed to complete the sampling pool, the system shall use representative sites (i.e., plumbing materials commonly found at other sites) throughout the distribution system.

(e) Each system whose distribution system contains lead service lines shall draw 50 percent of the samples it collects during each period from sites that contain lead pipes, or copper pipes with lead solder, and 50 percent of the samples from sites served by a lead service line. A system that cannot identify a sufficient number of sites served by a lead service line shall collect first draw samples from all of the sites identified as being served by such lines.

(f) A system that does not have enough taps that can provide first-draw samples shall submit written documentation to the Department identifying standing times and locations for enough non-first-draw samples to make up its sampling pool by the start of its next monitoring period.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64677

§ 64677. Sample Collection Methods for Taps.

(a) All tap samples for lead and copper collected pursuant to this chapter, with the exception of lead service line samples collected under section 64689 (Lead Service Line Sampling) and samples collected under subsection (d), shall be first-draw samples, pursuant to subsection (b).

(b) A first-draw sample shall be one liter in volume and have stood motionless in the plumbing system of each site for at least six hours, but not more than twelve. Samples from residential housing shall be collected from the cold-water kitchen tap or bathroom sink tap. Samples from a non-residential building shall be collected at an interior tap from which water is typically drawn for consumption. Samples may be collected by the system or the system may allow residents to collect tap samples after instructing the residents of the sampling procedures specified in this section. To avoid problems of residents handling nitric acid, acidification of samples may be done up to 14 days after collection. After acidification to resolubilize the metals, the sample shall stand in the original container for the time specified by the method used pursuant to section 64670(c) before it can be analyzed. If a system allows residents to perform sampling, the system may not challenge, based on alleged errors in sample collection, the accuracy of sampling results.

(c) A system shall collect each tap sample from the same site from which it collected a sample during the previous period. If the system cannot gain entry to a site in order to collect a tap sample, it may collect the tap sample from another site in its sampling pool as long as the new site meets the same criteria, and is as close as possible to the original site.

(d) A system that does not have enough taps to supply first-draw samples may apply to the Department in writing to substitute non-first-draw samples. Such systems shall collect as many first-draw samples as possible and identify sampling times and locations that would likely result in the longest standing time for the remaining sites.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New article 3 and section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order, including amendment of subsection (a), transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer of article 3 (sections 64677-64678) and repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64677, 22 CA ADC § 64677

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22 CCR § 64677.5

§ 64677.5. Sample Invalidation.

(a) A lead or copper sample may be invalidated by the Department if at least one of the following conditions is met and documented in writing:

(1) The laboratory establishes that improper sample analysis caused erroneous results;

(2) The Department determines that the sample was taken from a site that did not meet the site selection criteria in section 64676 (Sample Site Selection);

(3) The sample container was damaged in transit;

(4) The Department determines the sample does not meet the requirements in section 64677 (Sample Collection Methods for Taps); or

(5) There is substantial reason to believe that the sample was subject to tampering.

(b) To apply for invalidation of one or more samples, a system shall report the results of all samples for the period to the Department, including written documentation to support the system's belief that one or more samples should be invalidated.

(c) A sample invalidated pursuant to subsection (a) shall not count toward determining lead or copper 90th percentile levels or toward meeting any monitoring requirements in this chapter.

(d) The system shall collect replacement samples for any invalidated samples if, after the invalidation of one or more samples, the system has too few samples to meet the monitoring requirements of this chapter. Replacement samples taken after the end of the applicable period shall not be used to meet the monitoring requirements of a subsequent period. Replacement samples shall be collected as follows:

(1) As soon as possible, but no later than 20 days after the system receives notification from the Department that it has invalidated the sample, or by the end of the applicable period, whichever occurs later; and

(2) At the same locations as the invalidated samples or, if that is not possible, at locations other than those already used for sampling during the monitoring period.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64677.5, 22 CA ADC § 64677.5

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22 CCR § 64678

§ 64678. Determination of Exceedances of Lead and Copper Action Levels.

(a) The detection limits for purposes of reporting (DLRs) for lead and copper are as follows:

Table 64678-A. DLRs for Lead and Copper

Contaminant	DLR (mg/L)
Lead	0.005
Copper	0.050

Contaminant	*DLR (mg/L)*
Lead	0.005
Copper	0.050

(b) For purposes of determining the difference in concentration between the source water and the 90th percentile tap results, the following shall apply:

(1) Analytical results for lead greater than or equal to 0.001 mg/L and less than 0.005 mg/L shall be as measured or 0.0025 mg/L, whichever is greater.

(2) Analytical results for copper greater than or equal to 0.001 mg/L and less than 0.050 mg/L shall be as measured or 0.025 mg/L, whichever is greater.

(3) Analytical results below 0.001 mg/L for lead and copper shall be considered zero.

(c) Analytical results below the DLRs for lead and copper specified shall be reported as zero.

(d) The lead action level is exceeded if the concentration of lead in more than 10 percent of the tap water samples collected during any period is greater than 0.015 mg/L (i.e., if the “90th percentile” lead level is greater than 0.015 mg/L).

(e) The copper action level is exceeded if the concentration of copper in more than 10 percent of the tap water samples collected during any period is greater than 1.3 mg/L (i.e., if the “90th percentile” copper level is greater than 1.3 mg/L).

(f) The 90th percentile lead and copper levels shall be computed as follows:

(1) The results of all lead or copper samples collected during a period shall be placed in ascending order from the sample with the lowest concentration to the sample with the highest concentration. Each sampling result shall be assigned a number, ascending by single integers beginning with the number 1 for the sample with the lowest contaminant level. The number assigned to the sample with the highest contaminant level shall be equal to the total number of samples taken.

(2) The number of samples taken during the period shall be multiplied by 0.9.

(3) The contaminant concentration in the numbered sample identified by the calculation in paragraph (f)(2) is the 90th percentile contaminant level.

(4) For water systems serving less than or equal to 100 people that collect 5 samples per period, the 90th percentile is computed by taking the average of the highest and second highest concentrations.

(g) The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the system and submitted to the department for making any determinations.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64678, 22 CA ADC § 64678

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22 CCR § 64678.5

§ 64678.5. Monitoring Waivers for Small Systems.

(a) A small water system may apply to the Department for a waiver to reduce the tap sampling frequency for lead and copper to once every nine years, and shall continue tap sampling as required by this chapter until it receives written notification from the Department that the waiver has been approved.

(b) A system that meets the following materials and monitoring criteria for both lead and copper will be granted a full waiver, while a system that meets both sets of criteria for only one of the chemicals will be granted a partial waiver that covers only that chemical.

(1) To meet the materials criteria, a system shall provide certification and documentation that its distribution system and service lines and all drinking water supply plumbing, including plumbing conveying drinking water within all residences and buildings connected to the system, satisfy the following:

(A) For lead, the system shall be free of the following lead-containing materials:

1. Plastic pipes that contain lead plasticizers, or plastic service lines that contain lead plasticizers; and

2. Lead service lines, lead pipes, lead soldered pipe joints, and leaded brass or bronze alloy fittings and fixtures, unless the utility can demonstrate to the Department that such fittings and fixtures will not leach lead into the drinking water.

(B) For copper, the system shall be free of copper pipes and copper service lines.

(2) To meet the monitoring criteria, the system shall have completed at least one period of standard tap sampling and demonstrate that the 90th percentile levels for all periods of tap sampling conducted since the system became free of all lead-containing and/or copper-containing materials, as appropriate, do not exceed the following:

(A) For lead, 0.005 mg/L.

(B) For copper, 0.65 mg/L.

(c) If granted a waiver, the system shall

(1) Comply with any requirements that the Department includes as conditions of the waiver, such as limited monitoring, periodic outreach to customers to remind them to avoid installation of materials that might void the waiver;

(2) Conduct tap sampling at the reduced number of sites for one period every nine years for the chemical(s) for which the waiver has been granted;

(3) Provide the materials certification specified in paragraph (b)(1) for the chemical(s) for which the waiver has been granted, along with the monitoring results; and

(4) If the waiver was granted for only one chemical, continue to monitor pursuant to this chapter for the other chemical.

(d) If the system continues to satisfy the requirements of subsections (b) and (c), the waiver will be renewed automatically, unless the Department notifies the system in writing that the waiver has been revoked and why. A system whose waiver has been revoked may re-apply for a waiver at such time as it again meets the appropriate materials and monitoring criteria in subsection (b) and (c).

(e) If a system with a waiver adds a new source of water or changes any water treatment, the Department may require the system to add or modify waiver conditions (e.g., require recertification that the system is free of lead-containing and/or copper-containing materials, require additional tap sampling periods), if it deems such modifications are necessary to address treatment or source water changes at the system.

(f) If a system with a waiver becomes aware that it is no longer free of lead-containing or copper-containing materials, it shall notify the Department in writing no later than 60 days after becoming aware of such a change.

(g) If a system with a waiver that has been collecting samples during the months of June, July, August and September receives Department approval for an alternate set of months pursuant to section 64675(b)(2) (General Requirements for Tap Sampling for Lead and Copper), it shall conduct its next tap sampling before the waiver expires.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64678.5, 22 CA ADC § 64678.5

22 CCR § 64679

§ 64679. Supplemental Monitoring.

A water system with a lead action level exceedance shall offer to sample the tap water of any customer who requests it. The system is not required to pay for collecting or analyzing the sample.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New article 4 and section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order, including amendment of subsections (d) and (f), transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer of article 4 (section 64679) and repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64679, 22 CA ADC § 64679

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Article 4. Water Quality Parameter (WQP) Monitoring

22 CCR § 64680

§ 64680. General WQP Monitoring Requirements.

(a) WQP tap monitoring shall be:

(1) Representative of water quality throughout the distribution system, by considering the number of persons served, the different sources of water and treatment methods employed, and seasonal variability;

(2) Not restricted to sites targeted for lead and copper sampling; and

(3) Include two samples for each applicable WQP during each period, from the standard number of sites, based on the number of persons served, specified in table 64680-A.

Table 64680-A WQP Tap Monitoring Sites

System Size	Standard Tap Sampling	Reduced Tap Sampling
	(Minimimum Number of Sites)	
>100,000	25	10
10,001 to 100,000	10	7
3,301 to 10,000	3	3
501 to 3,300	2	2
101 to 500	1	1
<101	1	1

System Size	Standard Tap Sampling	Reduced Tap Sampling
	(Minimimum Number of Sites)	
>100,000	25	10
10,001 to 100,000	10	7
3,301 to 10,000	3	3
501 to 3,300	2	2
101 to 500	1	1
<101	1	1

(b) Initial WQP monitoring at the entry point(s) to the distribution system shall be two samples for each applicable WQP at each entry point from locations representative of each source after treatment. After the installation of CCT, only one sample is required at each entry point. If a system draws water from more than one source and the sources are combined before distribution, the system shall sample at each entry point during normal operating conditions.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New article 5 and section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Editorial correction of subsection (a)(1)(D)2.A. (Register 96, No. 38).

4. Certificate of Compliance as to 12-11-95 order, including amendment of subsections (a)(1)(D)2.D., (a) (1)(D)3.A. and (b)(5), transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

5. Repealer of former article 4 (section 64679), repealer of former article 5 (sections 64680-64681), new article 4 (sections 64680-64684) and repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64680, 22 CA ADC § 64680

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22 CCR § 64681

§ 64681. Initial WQP Monitoring.

For initial WQP monitoring, each system shall monitor for the following WQPs, pursuant to section 64680 (General WQP Monitoring Requirements):

(a) pH;

(b) Alkalinity;

(c) Orthophosphate, when an inhibitor containing a phosphate compound is used;

(d) Silica, when an inhibitor containing a silicate compound is used;

(e) Calcium;

(f) Conductivity; and

(g) Water temperature.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64681, 22 CA ADC § 64681

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Article 4. Water Quality Parameter (WQP) Monitoring

22 CCR § 64682

§ 64682. WQP Monitoring After CCT Installation.

(a) Each system that installs CCT shall monitor the following WQPs, pursuant to section 64680 (General WQP Monitoring Requirements), as applicable:

(1) At taps:

(A) pH;

(B) Alkalinity;

(C) Orthophosphate, when an inhibitor containing a phosphate compound is used;

(D) Silica, when an inhibitor containing a silicate compound is used;

(E) Calcium, when calcium carbonate stabilization is used as part of corrosion control.

(2) At each entry point to the distribution system every two weeks as a minimum:

(A) pH;

(B) When alkalinity is adjusted as part of CCT, a reading of the dosage rate of the chemical used to adjust alkalinity, and the alkalinity concentration; and

(C) When a corrosion inhibitor is used as part of CCT, a reading of the dosage rate of the inhibitor used, and the concentration of the active ingredient(s).

(b) A ground water system may use entry points that are representative of water quality and treatment conditions throughout the system for the monitoring required in paragraph (a)(2) as follows:

(1) If waters from untreated and treated groundwater sources mix, the system shall monitor entry points representative of each;

(2) Prior to monitoring, the system shall submit written documentation to the Department identifying the sites and demonstrating that they are representative.

(c) Subject to the Department's written approval, a system that has no action level exceedance and meets the Department-specified WQP values or ranges may reduce tap monitoring as follows:

(1) After two consecutive periods during which it has met the WQP values or ranges, the system shall monitor each period at the reduced number of sites, pursuant to table 64680-A;

(2) After three consecutive years (including the initial sampling year) during which it has met the WQP values or ranges, the system shall monitor annually at the reduced number of sites at evenly-spaced intervals throughout the year; and

(3) After three consecutive years of annual monitoring during which the system meets the WQP values or ranges, the system shall monitor once every three years at the reduced number of sites at evenly-spaced intervals throughout the monitoring year.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New article 6 and section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Editorial correction of subsection (b) (Register 96, No. 38).

4. Certificate of Compliance as to 12-11-95 order, including amendment of subsection (i), transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

5. Repealer of article 6 (sections 64682-64685) and repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64682, 22 CA ADC § 64682

Barclays Official California Code of Regulations Currentness
Title 22. Social Security
Division 4. Environmental Health
Chapter 17.5. Lead and Copper
Article 5. Corrosion Control

22 CCR § 64683

§ 64683. Corrosion Control Study Procedure.

(a) Each system conducting a corrosion control study shall:

(1) Evaluate the effectiveness of each of the following treatments, and, if appropriate, combinations of the following treatments to identify the CCT for that system:

(A) Alkalinity and pH adjustment;

(B) Calcium hardness adjustment; and

(C) The addition of a corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration throughout the distribution system.

(2) Evaluate each of the corrosion control treatments using either pipe rig/loop tests, metal coupon tests, partial-system tests, or analyses based on documentation of such treatments from systems of similar size, water chemistry and distribution system configuration.

(3) Measure the following WQPs in any tests conducted under this subsection before and after evaluating the corrosion control treatments listed above:

(A) Lead;

(B) Copper;

(C) pH;

(D) Alkalinity;

(E) Calcium;

(F) Conductivity;

(G) Corrosion control inhibitor active ingredient (when an inhibitor is used);

(H) Water temperature.

(4) Identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment and document such constraints with at least one of the following:

(A) Data and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used by another water system with comparable water quality characteristics; and/or

(B) Data and documentation demonstrating that the water system has previously attempted to evaluate a particular corrosion control treatment and has found that the treatment is ineffective or adversely affects other water quality treatment processes.

(5) Evaluate the effect of the chemicals used for corrosion control treatment on other water treatment processes.

(6) Recommend to the Department in writing the treatment option that the corrosion control studies indicate constitutes CCT for that system on the basis of an analysis of the data generated during each evaluation. The water system shall provide a rationale for its recommendation along with all supporting documentation specified in paragraphs (a)(1) through (5) of this section.

(b) Based on the study conducted pursuant to subsection (a), and a system's recommended treatment alternative, the Department will either approve the corrosion control treatment option recommended by the system, or designate alternative corrosion control treatment(s) from among those listed in paragraph (a)(1) of this section, notify the system of its decision on CCT in writing and explain the basis for its determination. If the Department requests additional information to aid its review, the water system shall provide the information.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Editorial correction of subsections (c)(2) and (d) (Register 96, No. 38).

4. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

5. Repealer of former article 5 (sections 64680-64681), new article 5 (sections 64683-64685) and repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64683, 22 CA ADC § 64683

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22 CCR § 64684

§ 64684. CCT Installation and Operation.

(a) Each system shall install and operate throughout its distribution system the CCT designated by the Department in subsection 64683(b) (Corrosion Control Studies) or paragraph 64673(c)(3) (Small and Medium-size Water System Requirements) and monitor WQPs pursuant to section 64682 (WQP Monitoring After CCT Installation). When the system completes its installation of CCT, it shall submit a letter to the Department certifying that it has done so.

(b) After the system installs CCT, the Department will review the treatment and pre- and post-treatment tap sampling and WQP monitoring data and specify WQPs in writing within 42 months of its CCT designation as follows:

(1) A minimum value or a range of values for pH measured at each entry point to the distribution system;

(2) A minimum pH value of 7.0 or greater, measured in all tap samples, unless the Department determines that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the system to optimize corrosion control;

(3) If a corrosion inhibitor is used, a minimum concentration or a range of concentrations for the inhibitor, measured at each entry point to the distribution system and in all tap samples, that the Department determines is necessary to maintain a passivating film on the interior walls of the pipes of the distribution system;

(4) If alkalinity is adjusted as part of CCT, a minimum concentration or a range of concentrations for alkalinity, measured at each entry point to the distribution system and in all tap samples;

(5) If calcium carbonate stabilization is used as part of corrosion control, a minimum concentration or a range of concentrations for calcium, measured in all tap samples; and

(6) Values for additional WQPs determined by the Department to reflect CCT for the system.

(c) After the Department specifies WQP values and ranges, each system shall monitor pursuant to section 64680 (General WQP Monitoring Requirements) and maintain WQPs as specified by the Department.

(d) A system shall be out of compliance with the WQP values and ranges specified by the Department pursuant to subsection (b) for any period during which it has excursions for more than nine days.

(1) An excursion occurs when a “daily value” at one or more sample sites for one or more WQPs in a day is below the minimum value or outside the range of Department-specified WQPs.

(2) A “daily value” for a WQP at a site is determined as follows:

(A) If sampling is more than once a day by continuous monitoring, grab sampling or both, the daily value shall be the average of all the day's results at the sampling site.

(B) If sampling is once a day, the daily value shall be the day's result.

(C) If sampling is less than once a day, the daily value shall apply to the day that the water supplier receives the result from the laboratory or the 30th day after the sample is collected, whichever comes first.

(3) When an excursion occurs, within 48 hours of being notified of the results of the initial sample(s), the system shall investigate the cause and collect a followup sample at each affected site for each WQP that did not meet the Department-specified values. The criteria in paragraphs (d)(1) and (2) shall be applied to the followup sample results to determine if another excursion has occurred.

(e) A system conducting reduced WQP tap monitoring that fails to meet the Department-specified WQPs shall resume standard WQP tap monitoring pursuant to section 64680 (General WQP Monitoring Requirements).

(f) The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the system and submitted to the Department for making any determinations (i.e., determining concentrations of WQPs).

(g) Upon its own initiative or in response to a request by a system, the Department may modify in writing its designation of CCT or its specified WQP values and ranges if it determines that modification is necessary to ensure that the system continues to maintain CCT. Any request shall be in writing, explain the reason for the requested modification, and include supporting documentation.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Editorial correction of subsection (b)(2)(A) (Register 96, No. 38).

4. Certificate of Compliance as to 12-11-95 order, including amendment of subsection (a), transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

5. Repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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Chapter 17.5. Lead and Copper
Article 6. Source Water Requirements for Action Level Exceedances

22 CCR § 64685

§ 64685. Source Water Monitoring and Treatment Designation.

(a) Within six months of an action level exceedance, a system shall:

(1) Collect one lead and copper source water sample from each entry point to the distribution system that is representative of the source or combined sources and is collected after any treatment, if treatment is applied before distribution;

(2) In writing, either recommend to the Department the installation and operation of a source water treatment (ion exchange, reverse osmosis, lime softening, or coagulation/filtration) or demonstrate that source water treatment is not needed to minimize lead and copper levels at users' taps; and

(3) Submit any additional information requested by the Department to aid in its determination of whether source water treatment is necessary to minimize lead and copper levels in water delivered to users' taps.

(b) The Department will make a determination regarding source water treatment within six months after submission of monitoring results under subsection (a).

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order, including amendment of subsection (a)(1), transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer of former article 6 (sections 64682-64685), new article 6 (sections 64685-64686) and repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64685, 22 CA ADC § 64685

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22 CCR § 64686

§ 64686. Requirements Subsequent to the Department's Designation.

(a) If the Department determines that source water treatment is required pursuant to subsection 64685(b), the system shall comply with the following within the specified timeframes that begin with the Department's determination regarding source water treatment:

(1) Install the treatment within 24 months and submit a letter to the Department certifying that installation has been completed;

(2) Collect an additional source water sample from each entry point to the distribution system during two consecutive periods within 36 months;

(3) Complete two consecutive periods of standard monitoring for lead and copper pursuant to section 64675 (General Requirements for Tap Sampling for Lead and Copper) within 36 months.

(b) Within 6 months after the system installs source water treatment, based on its review of the data collected pursuant to subsection (a) and the contaminant removal capability of the installed treatment when properly operated, the Department will specify maximum permissible lead and copper levels for water entering the distribution system. The water system shall comply with these maximum permissible levels.

(c) After the Department specifies maximum permissible levels or determines that source water treatment is not needed, the system shall conduct standard monitoring related to source water pursuant to table 64686-A, according to source water type. If approved by the Department based on a review of source water data, the system may reduce monitoring pursuant to table 64686-A.

Table 64686-A. Standard and Reduced Monitoring Related to Source Water

		Surface water with or
Type of monitoring	Ground water	without groundwater
Standard monitoring	1 sample at each entry	1 sample at each entry
point every 3 years, as	point every year, as	
a minimum	a minimum	

Reduced monitoring, after 3 consecutive rounds of standard monitoring in compliance with maximum permissible levels.	1 sample at each entry point every 9 years	1 sample at each entry point every 9 years

Type of monitoring	*Ground water*	*Surface water with or without groundwater*
Standard monitoring	1 sample at each entry point every 3 years, as a minimum	1 sample at each entry point every year, as a minimum
Reduced monitoring, after 3 consecutive rounds of standard monitoring in compliance with maximum permissible levels.	1 sample at each entry point every 9 years	1 sample at each entry point every 9 years

(d) If a system does not have an action level exceedance for lead and/or copper during three consecutive years for groundwater or one year for surface water with or without groundwater, the system is not required to conduct sampling related to source water for the specific chemical.

(e) If the results of sampling indicate an exceedance of the maximum permissible levels specified pursuant to subsection (b), one additional sample may be collected at the same sampling point as soon as possible within 14 days of the initial sample to confirm the result. If a confirmation sample is collected, then the average of the initial and confirmation sample results shall be used to determine compliance with the maximum permissible levels.

(f) A water system that begins using a new water source shall reinitiate standard monitoring pursuant to subsection (c) and conduct three rounds of monitoring with the new source online before reducing the monitoring frequency.

(g) Upon its own initiative or in response to a request by a system, the Department may modify its determination of the source water treatment, or maximum permissible lead and copper concentrations for treated source water. Any request shall be in writing, explain the reason for the requested modification, and include supporting documentation.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 1-16-90; operative 2-15-90 (Register 90, No. 4).

2. Renumbering and amendment of Noteof former section 64686 to section 64469 filed 5-27-92; operative 6-26-92 (Register 92, No. 22).

3. New article 7 and section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

4. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

5. Certificate of Compliance as to 12-11-95 order, including amendment of subsections (b)(1) and (c), transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

6. Repealer of article 7 (sections 64686-64688) and repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

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22 CCR § 64686, 22 CA ADC § 64686

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22 CCR § 64687

§ 64687. Lead Public Education Program Content and Delivery.

(a) Each system with a lead action level exceedance shall conduct a lead public education program that includes delivery of the following public education materials pursuant to subsection (d). Within 10 days after the period during which the program was required, the system shall submit a letter to the Department demonstrating that it has delivered the public education materials as required and include a list of all the newspapers, radio stations, television stations, facilities and organizations to which the system delivered the materials during the previous year.

(1) Except as provided in subsection (b), a community water system shall include the following text in all of the printed materials it distributes through its lead public education program:

(A) Introduction. The California Department of Health Services (DHS), the U.S. Environmental Protection Agency, and [insert name of water supplier] are concerned about lead in your drinking water. Although most homes have very low levels of lead in their drinking water, some homes in the community have lead levels above the state and federal action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under state and federal law we are required to have a program in place to minimize lead in your drinking water by [insert date when corrosion control will be completed for your system]. This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace the portion of each lead service line that we own if the line contributes lead concentrations of 15 ppb or more after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at [insert water system's phone number]. This brochure explains the simple steps you can take to protect you and your family by reducing your exposure to lead in drinking water.

(B) Health Effects of Lead. Lead is a common metal found throughout the environment in lead-based paint, air, soil, household dust, food, certain types of pottery porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination -- like dirt and dust -- that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

(C) Lead In Drinking Water

1. Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. The U.S. Environmental Protection Agency estimates that drinking water can make up 20 percent or more of a person's total exposure to lead.

2. Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead-based solder used to join copper pipe, brass and chrome plated brass faucets, and in some cases, pipes made of lead that connect your house to the water main (service lines). In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials to 8.0%. In California, a similar law prohibiting the use of both lead solder and lead pipe was enacted in 1985.

3. When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon after returning from work or school, can contain fairly high levels of lead.

(D) Steps You Can Take in the Home to Reduce Exposure to Lead in Drinking Water

1. Despite our best efforts mentioned earlier to control water corrosivity and remove lead from the water supply, lead levels in some homes or buildings can be high. To find out whether you need to take action in your own home, have your drinking water tested to determine if it contains excessive concentrations of lead. Testing the water is essential because you cannot see, taste, or smell lead in drinking water. Some local laboratories that can provide this service are listed at the end of this booklet. For more information on having your water tested, please call [insert phone number of water system].

2. If a water test indicates that the drinking water drawn from a tap in your home contains lead above 15 ppb, then you should take the following precautions:

A. Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. The longer water resides in your home's plumbing the more lead it may contain. Flushing the tap means running the cold water faucet until the water gets noticeably colder, usually about 15 to 30 seconds. If your house has a lead service line to the water main, you may have to flush the water for a longer time, perhaps one minute, before drinking. Although toilet flushing or showering flushes water through a portion of your home's plumbing system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to protect your family's health. It usually uses less than one or two gallons of water and costs less than [insert a cost estimate based on flushing two times a day for 30 days] per month. To conserve water, fill a couple of bottles for drinking water after flushing the tap, and whenever possible use the first flush water to wash the dishes or water the plants. If you live in a high-rise building, letting the water flow before using it may not work to lessen your risk from lead. The plumbing systems have more, and sometimes larger pipes than smaller buildings. Ask your landlord for help in locating the source of the lead and for advice on reducing the lead level.

B. Try not to cook with, or drink water from the hot water tap. Hot water can dissolve more lead more quickly than cold water. If you need hot water, draw water from the cold tap and heat it on the stove.

C. Remove loose lead solder and debris from the plumbing materials installed in newly constructed homes, or homes in which the plumbing has recently been replaced, by removing the faucet strainers from all taps and running the water from 3 to 5 minutes. Thereafter, periodically remove the strainers and flush out any debris that has accumulated over time.

D. If your copper pipes are joined with lead solder that has been installed illegally since it was banned in 1986, notify the plumber who did the work and request that he or she replace the lead solder with lead-free solder. Lead solder looks dull gray, and when scratched with a key looks shiny. In addition, notify the California Department of Health Services and your local environmental health department about the violation.

E. Determine whether or not the service line that connects your home or apartment to the water main is made of lead. The best way to determine if your service line is made of lead is by either hiring a licensed plumber to inspect the line or by contacting the plumbing contractor who installed the line. You can identify the plumbing contractor by checking the record of building permits which should be maintained in the files of the [insert name of department that issues building permits]. A licensed plumber can at the same time check to see if your home's plumbing contains lead solder, lead pipes, or pipe fittings that contain lead. The public water system that delivers water to your home should also maintain records of the materials located in the distribution system. If the service line that connects your dwelling to the water main contributes more than 15 ppb to drinking water, after our comprehensive treatment program is in place, we are required to replace the portion of the line we own. If the line is only partially owned by the [insert name of the city, county, or water system that owns the line], we are required to provide the owner of the privately-owned portion of the service line with information on how to replace the privately-owned portion of the service line, and offer to replace that portion of the line at the owner's expense. If we replace only the portion of the line that we own, we also are required to notify you in advance and provide you with information on the steps you can take to minimize exposure to any temporary increase in lead levels that may result from the partial replacement, to take a follow-up sample at our expense from the line within 72 hours after the partial replacement, and to mail or otherwise provide you with the results of that sample within three business days of receiving the results. Acceptable replacement alternatives include copper, stainless steel, and plastic pipes. Partial replacement should avoid the creation of mixed piping systems and include the installation of approved dielectric couplings at all dissimilar metal interfaces.

F. Have an electrician check your wiring. If grounding wires from the electrical system are attached to your pipes, corrosion may be greater. Check with a licensed electrician or your local electrical code to determine if your wiring can be grounded elsewhere. DO NOT attempt to change the wiring yourself because improper grounding can cause electrical shock and fire hazards.

3. The steps described above will reduce the lead concentrations in your drinking water. However, if a water test indicates that the drinking water coming from your tap contains lead concentrations in excess of 15 ppb after flushing, or after we have completed our actions to minimize lead levels, then you may want to take the following additional measures:

A. Purchase or lease a home treatment device. Home treatment devices are limited in that each unit treats only the water that flows from the faucet to which it is connected, and all of the devices require periodic maintenance and replacement. Devices such as reverse osmosis systems or distillers can effectively remove lead from your drinking water. Since these treatments remove dissolved minerals, water treated by these devices will have a greater tendency to leach lead from brass faucets or fittings which the water contacts after treatment. Some activated carbon filters may reduce lead levels at the tap, however all lead reduction claims should be investigated. Be sure to check the actual performance of a specific home treatment device before and after installing the unit. The California Department of Health Services certifies the effectiveness of home treatment devices. Only devices certified by the California Department of Health Services to remove lead should be used for this purpose.

B. Purchase bottled water for drinking and cooking.

4. You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. State and local government agencies that can be contacted include:

A. [insert the name of city or county department of public utilities] at [insert phone number] can provide you with information about your community's water supply, and a list of local laboratories that have been certified by the California Department of Health Services for testing water quality;

B. [insert the name of city or county department that issues building permits] at [insert phone number] can provide you with information about building permit records that should contain the names of plumbing contractors that plumbed your home; and

C. California Department of Health Services, Childhood Lead Poisoning Prevention Branch at [insert the phone number] or the [insert the name of the city or county health department] at [insert phone number] can provide you with information about the health effects of lead and how you can have your child's blood tested.

5. The following is a list of some state approved laboratories in your area that you can call to have your water tested for lead. [Insert names and phone numbers of at least two laboratories].

(2) Except as provided in subsection (b), a nontransient-noncommunity water system shall include either the text in paragraph (a)(1) or the following text, in all of the printed materials it distributes through its lead public education program.

(A) Introduction. The California Department of Health Services, the United States Environmental Protection Agency (EPA) and [insert name of water supplier] are concerned about lead in your drinking water. Some drinking water samples taken from this facility have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under Federal law we are required to have a program in place to minimize lead in your drinking water by [insert date when corrosion control will be completed for your system]. This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace the portion of each lead service line that we own if the line contributes lead concentrations of more than 15 ppb after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at [insert water system's phone number]. This brochure explains the simple steps you can take to protect yourself by reducing your exposure to lead in drinking water.

(B) Health Effects of Lead. Lead is found throughout the environment in lead-based paint, air, soil, household dust, food, certain types of pottery porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination - like dirt and dust - that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

1. Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. The EPA estimates that drinking water can make up 20 percent or more of a person's total exposure to lead.

2. Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead-based solder used to join copper pipe, brass and chrome-plated brass faucets, and in some cases, pipes made of lead that connect houses and buildings to water mains (service lines). In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials to 8.0%.

3. When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon if the water has not been used all day, can contain fairly high levels of lead.

(D) Steps You Can Take. Steps you can take to reduce exposure to lead in drinking water include:

1. Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. The longer water resides in plumbing the more lead it may contain. Flushing the tap means running the cold water faucet for about 15-30 seconds. Although toilet flushing or showering flushes water through a portion of the plumbing system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to protect your health. It usually uses less than one gallon of water.

2. Do not cook with, or drink water from the hot water tap. Hot water can dissolve more lead more quickly than cold water. If you need hot water, draw water from the cold tap and then heat it.

3. The steps described above will reduce the lead concentrations in your drinking water. However, if you are still concerned, you may wish to use bottled water for drinking and cooking.

4. You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. State and local government agencies that can be contacted include:

A. [insert the name or title of facility official if appropriate] at [insert phone number] can provide you with information about your facility's water supply; and

B. [insert the name or title of the State Department of Health Services] at [insert phone number] or the [insert the name of the city or county health department] at [insert phone number] can provide you with information about the health effects of lead.

(b) Any additional information presented shall be consistent with the information in subsection (a) and be in plain language that can be understood by laypersons. A system may delete information pertaining to lead service lines, on approval by the Department, if the water system does not have any such lines. Building permit record availability and consumer access to these records may be modified, if approved by the Department.

(c) The system shall include the following information in all public service announcements submitted under its lead public education program to television and radio stations for broadcasting:

(1) Why should everyone want to know the facts about lead and drinking water? Because unhealthy amounts of lead can enter drinking water through the plumbing in your home. That's why I urge you to do what I did. I had my water tested for [insert free or cost per sample]. You can contact the [insert the name of the city or water system] for information on testing and on simple ways to reduce your exposure to lead in drinking water.

(2) To have your water tested for lead, or to get more information about this public health concern, please call [insert the phone number of the city or water system].

(d) The system shall conduct the lead public education program as follows:

(1) In communities where a significant proportion of the population speaks a language other than English, public education materials shall be communicated in the appropriate language(s).

(2) Within 60 days after it has a lead action level exceedance, unless it is already conducting a lead public education program, a community water system shall:

(A) Insert notices in each customer's water utility bill containing the information in paragraph (a)(1), along with the following alert on the water bill itself in large print: SOME HOMES IN THIS COMMUNITY HAVE ELEVATED LEAD LEVELS IN THEIR DRINKING WATER. LEAD CAN POSE A SIGNIFICANT RISK TO YOUR HEALTH. PLEASE READ THE ENCLOSED NOTICE FOR FURTHER INFORMATION. A community water system with a billing cycle that does not include a billing within 60 days of the exceedance, or that cannot insert information in the bill without making major changes to its billing system, may use a separate mailing as long as it is conducted within 60 days of the exceedance.

(B) Submit the information in paragraph (a)(1) to the editorial departments of the major daily and weekly newspapers circulated throughout the community.

(C) Deliver pamphlets and/or brochures that contain the public education materials in subparagraphs (a)(1)(B) and (D) to facilities and organizations, including the following:

1. Public schools and/or local school boards;

2. City or county health department;

3. Women, Infants, and Children and/or Head Start Program(s) whenever available;

4. Public and private hospitals and/or clinics;

5. Pediatricians;

6. Family planning clinics; and

7. Local welfare agencies.

(D) Submit the public service announcement in subsection (c) to at least five of the radio and television stations with the largest audiences that broadcast to the community served by the system.

(3) A community system shall repeat the tasks in subparagraphs (d)(2)(A),(B) and (C) every 12 months, and the tasks in subparagraph (d)(2)(D) every 6 months for as long as the system has a lead action level exceedance.

(4) Within 60 days after it has a lead action level exceedance, unless it is already conducting a lead public education program, a nontransient-noncommunity system shall deliver the public education materials in paragraphs (a)(1) or (a)(2) as follows:

(A) Post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system; and

(B) Distribute informational pamphlets and/or brochures on lead in drinking water to each person served by the system. The Department may allow the system to utilize electronic transmission in lieu of or combined with printed materials as long as it achieves at least the same coverage.

(5) A nontransient-noncommunity system shall repeat the tasks in paragraph (4) at least once during each calendar year in which the system has a lead action level exceedance.

(6) A system may discontinue the lead public education program if it does not have a lead action level exceedance during the most recent period. The system shall recommence the program pursuant to this section if it subsequently has a lead action level exceedance.

(7) A community water system may apply to the Department, in writing, to use the text in paragraph (a)(2) in lieu of the text in paragraph (a)(1) and to perform the tasks listed in paragraphs (d)(4) and (c)(5) of this section in lieu of the tasks in paragraphs (d)(2) and (d)(3) of this section if:

(A) The system is a facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices; and

(B) The system provides water as part of the cost of services provided and does not separately charge for water consumption.

(8) A community water system serving 3,300 or fewer people may omit the task contained in subparagraph (d)(2)(D). As long as it distributes notices containing the information contained in paragraph (a)(1) of this section to every household served by the system, such systems may further limit their public education programs as follows:

(A) Systems serving 500 or fewer people may forego the task contained in subparagraph (d)(2)(B). Such a system may limit the distribution of the public education materials required under subparagraph (d)(2)(C) to facilities and organizations served by the system that are most likely to be visited regularly by pregnant women and children, unless notified by the Department in writing that it shall make a broader distribution.

(B) If approved by the Department in writing, a system serving 501 to 3,300 people may omit the task in subparagraph (d)(2)(B) and/or limit the distribution of the public education materials required under subparagraph (d)(2)(C) to facilities and organizations served by the system that are most likely to be visited regularly by pregnant women and children.

(9) A community water system serving 3,300 or fewer people that delivers the lead public education in accordance with paragraph (d)(8)(A) of this section shall repeat these requirements at least once during each calendar year in which the system exceeds the lead action level.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order, including amendment of subsection (a), transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer of former article 7 (sections 64686-64688), new article 7 (section 64687) and repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

This database is current through 7/27/18 Register 2018, No. 30

22 CCR § 64687, 22 CA ADC § 64687

End of Document

22 CCR § 64688

§ 64688. Lead Service Line Replacement.

(a) A system shall replace lead service lines if:

(1) It has a lead action level exceedance in tap samples after installing corrosion control and/or source water treatment (whichever sampling occurs later) and/or

(2) It is in violation for failure to install source water treatment or CCT.

(b) Within 6 months after it has a lead action level exceedance, the system shall demonstrate in writing that it has conducted a materials evaluation including that in section 64676 (Sample Site Selection) to identify the initial number of lead service lines in its distribution system, and shall submit both the demonstration and a schedule for complying with subsection (c) to the Department.

(c) Except as provided in subsection (e), a system that is required to conduct lead service line replacement shall annually replace at least 7 percent of the initial number of lead service lines in its distribution system, pursuant to the following.

(1) At the time the lead service line replacement begins, the system shall identify the initial number of lead service lines in its distribution system based on the evaluation in section 64676 (Sample Site Selection).

(2) The first year of lead service line replacement shall begin on the date the system first had a lead action level exceedance subsequent to its installation of CCT and, if required pursuant to section 64686, source water treatment.

(3) The system is not required to replace an individual lead service line if the lead concentration in each and every service line sample from that line, taken pursuant to the section 64687 (Lead Service Line Sampling), is less than or equal to 0.015 mg/L.

(4) The system shall replace that portion of the lead service line that it owns and keep ownership documentation in its files and offer to replace the building owner's portion of the line with the cost being borne by the building owner. If the building owner does not accept the offer, the system shall:

(A) At least 45 days prior to commencing the partial replacement, notify the resident(s) of all buildings served by the line that they may experience a temporary increase of lead levels in their drinking water, along with guidance on measures they may take to minimize their exposure. If the replacement is in conjunction with emergency repairs, the Department will allow a shorter notice, depending on the nature of the emergency and the timing involved. The notice shall be mailed unless an alternate method is approved by the Department, based on the feasibility of insuring that all consumers receive the notice; and

(B) Inform the resident(s) that the system will collect a first flush tap water sample within 72 hours after the partial replacement of the service line has been completed if the resident(s) so desire. If the resident(s) accept the offer, the system shall collect the sample and report the results to the resident(s) and the owner within three business days of receiving the results and to the Department.

(d) Within 12 months after the lead action level exceedance, and every 12 months thereafter, the system shall submit in writing to the Department the number of lead service lines scheduled to be replaced during the previous year of the system's replacement schedule, along with the following information to the Department:

(1) The number and location of each lead service line replaced during the previous year of the system's replacement schedule to demonstrate that it has replaced at least 7 percent of the initial lead service lines within the previous 12 months, or a greater number of lines if required by the Department; or

(2) Lead service line sampling results that demonstrate that the lead level from an individual line(s) is less than or equal to 0.015 mg/L, pursuant to section 64689 (Lead Service Line Sampling). The system shall submit the results of the lead service line sampling including the lead levels, location of each lead service line sampled, the sampling method, and the date of sampling. It shall also include the number and location of each lead service line replaced during the previous year. In such cases, the total number of lines replaced and/or that meet the criteria shall equal at least 7 percent of the initial number of lead lines identified or the percentage required by the Department.

(e) A system shall replace lead service lines at a faster rate than that required by subsection (b), taking into account the number of lead service lines in the system, if the Department determines either that this is necessary based on elevated blood lead levels in the population served, or that it is feasible to complete the lead service line replacement program in a shorter time without increasing the water rates to the customers.

(f) A system may cease replacing lead service lines when it has two consecutive periods without a lead action level exceedance. If the system has a lead action level exceedance during any subsequent period, it shall recommence replacing lead service lines.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order, including amendment of subsections (c)(1)-(2) and (c)(4), transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer of former article 8 (sections 64689-64690), new article 8 (sections 64688-64689) and repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

This database is current through 7/27/18 Register 2018, No. 30

22 CCR § 64688, 22 CA ADC § 64688

End of Document

Barclays Official California Code of Regulations Currentness
Title 22. Social Security
Division 4. Environmental Health
Chapter 17.5. Lead and Copper
Article 8. Lead Service Line Requirements for Action Level Exceedances

22 CCR § 64689

§ 64689. Lead Service Line Sampling.

(a) Each lead service line sample shall be one liter in volume and have stood motionless in the lead service line for at least six hours, but not more than twelve.

(b) Lead service line samples shall be collected in one of the following three ways:

(1) At the tap after flushing the volume of water between the tap and the lead service line. The volume of water to be flushed shall be calculated based on the interior diameter and length of the pipe between the tap and the lead service line;

(2) Tapping directly into the lead service line; or

(3) If the sampling site is a building constructed as a single-family residence, allowing the water to run until there is a change in temperature that would be indicative of water that has been standing in the lead service line.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New article 8 and section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order, including amendment of subsection (b), transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer of article 8 (sections 64689-64690) and repealer and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

This database is current through 7/27/18 Register 2018, No. 30

22 CCR § 64689, 22 CA ADC § 64689

22 CCR § 64690

§ 64690. Source Water Monitoring Frequency Requirements.

Note: Authority cited: Sections 100275, 116350, 116365, 116375 and 116385, Health and Safety Code. Reference: Sections 116300 through 116750, Health and Safety Code; and 40 Code of Federal Regulations 141.88(b through e).

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Editorial correction of subsection (c)(1)(B) (Register 96, No. 38).

4. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

5. Repealer filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

This database is current through 7/27/18 Register 2018, No. 30

22 CCR § 64690, 22 CA ADC § 64690

End of Document

Barclays Official California Code of Regulations Currentness
Title 22. Social Security
Division 4. Environmental Health
Chapter 17.5. Lead and Copper
Article 9. Reporting and Recordkeeping

22 CCR § 64690.10

§ 64690.10. Data Reporting.

Each system shall report the following within the first 10 days after the end of each period during which such sampling or monitoring was conducted:

(a) For lead and copper tap sampling:

(1) The results of all tap samples including the location of each site and the associated tier criteria from section 64676 (Sample Site Selection);

(2) The 90th percentile lead and copper concentrations calculated pursuant to section 64678 (Determination of Exceedances of Lead and Copper Action Levels); and

(3) With the exception of the first period of tap sampling, an identification of any site that was not sampled during previous periods, along with an explanation of why the sampling site was changed;

(b) For WQP monitoring, the results of all samples collected and analyzed pursuant to article 4 (WQP Monitoring) of this chapter;

(c) For source water monitoring:

(1) The results for all samples related to source water collected and analyzed under article 6 (Source Water Requirements for Action Level Exceedances) of this chapter; and

(2) With the exception of the first round of sampling related to source water, an identification of any site that was not sampled during previous periods along with an explanation of why the sampling point was changed; and

(d) The results for any samples collected and analyzed for lead and copper or WQPs in addition to those required by this chapter.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. Repealer of former article 9 (sections 64691-64692), new article 9 (sections 64690.10-64690.80) and new section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

This database is current through 7/27/18 Register 2018, No. 30

22 CCR § 64690.10, 22 CA ADC § 64690.10

End of Document

22 CCR § 64690.80

§ 64690.80. Recordkeeping.

Any system subject to the requirements of this chapter shall retain on its premises original records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, Department determinations, and any other information required by this chapter. Each water system shall retain the records required by this section for no fewer than 12 years or two compliance cycles (as defined in Section 64400.20), whichever is longer.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116325-116750, Health and Safety Code.

HISTORY

1. New section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

This database is current through 7/27/18 Register 2018, No. 30

22 CCR § 64690.80, 22 CA ADC § 64690.80

End of Document

Barclays Official California Code of Regulations Currentness
Title 22. Social Security
Division 4. Environmental Health
Chapter 17.5. Lead and Copper
Article 9. Reporting and Recordkeeping

22 CCR § 64691

§ 64691. Reporting Requirements.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116300 through 116750, Health and Safety Code; and 40 Code of Federal Regulations 141.90.

HISTORY

1. New article 9 and section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer of article 9 (sections 64691-64692) and repealer of section filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

This database is current through 7/27/18 Register 2018, No. 30

22 CCR § 64691, 22 CA ADC § 64691

End of Document

Barclays Official California Code of Regulations Currentness
Title 22. Social Security
Division 4. Environmental Health
Chapter 17.5. Lead and Copper
Article 9. Reporting and Recordkeeping

22 CCR § 64692

§ 64692. Recordkeeping Requirements.

Note: Authority cited: Sections 100275, 116350, 116365 and 116375, Health and Safety Code. Reference: Sections 116300 through 116750, Health and Safety Code; and 40 Code of Federal Regulations 141.91.

HISTORY

1. New section filed 12-11-95 as an emergency; operative 12-11-95 (Register 95, No. 50). A Certificate of Compliance must be transmitted to OAL by 4-9-96 or emergency language will be repealed by operation of law on the following day.

2. Refiling of 12-11-95 order, including amendment of Note, filed 4-9-96 as an emergency; operative 4-10-96 (Register 96, No. 15). A Certificate of Compliance must be transmitted to OAL by 8-8-96 or emergency language will be repealed by operation of law on the following day.

3. Certificate of Compliance as to 12-11-95 order transmitted to OAL 8-7-96 and filed 9-16-96 (Register 96, No. 38).

4. Repealer filed 9-11-2003; operative 10-11-2003 (Register 2003, No. 37).

This database is current through 7/27/18 Register 2018, No. 30

22 CCR § 64692, 22 CA ADC § 64692

End of Document

ATTACHMENT

3

OFFICE OF THE GOVERNOR

OCT 9 2015

To the Members of the California State Senate:

I am returning Senate Bill 334 without my signature.

This bill requires a school district that has a drinking water source that does not meet the Environmental Protection Agency's drinking water standards to provide alternative drinking water to their students.

I agree that all California students should have access to safe drinking water but this bill creates a state mandate of uncertain but possibly very large magnitude.

As our first order of business, local schools should understand the nature of their water quality problem, if there is one. Accordingly, I am directing the State Water Resources Control Board to work with school districts and local public water systems to incorporate water quality testing in schools as part of their lead and copper rule. School districts should utilize this information to ensure all students are provided safe water.

Sincerely,

Edmund G. Brown

Edmund G. Brown Jr.

GOVERNOR EDMUND G. BROWN JR. • SACRAMENTO, CALIFORNIA 95814 • (916) 445-2841

ATTACHMENT

4

Senate Bill No. 334

Passed the Senate September 10, 2015

____

Secretary of the Senate

Passed the Assembly September 8, 2015

____

Chief Clerk of the Assembly

This bill was received by the Governor this __________ day of ________________, 2015, at _____ o'clock ____M.

____

Private Secretary of the Governor

CHAPTER ________

An act to amend Sections 32242 and 38086 of, to add Sections 32241.5, 32246, and 32249 to, and to add Article 13 (commencing with Section 49580) to Chapter 9 of Part 27 of Division 4 of Title 2 of, the Education Code, relating to pupil health.

LEGISLATIVE COUNSEL'S DIGEST

SB 334, Leyva. Pupil health: drinking water.

(1) Existing law requires a school district to provide access to free, fresh drinking water during meal times in school food service areas, unless the governing board of a school district adopts a resolution stating that it is unable to comply with this requirement and demonstrating the reasons why it is unable to comply due to fiscal constraints or health and safety concerns. Existing law requires the resolution to be publicly noticed on at least 2 consecutive meeting agendas and approved by at least a majority of the governing board of the school district.

This bill would delete the provision authorizing a school district to adopt a resolution stating that it is unable to provide access to free, fresh drinking water during meal times. The bill would instead specify that a school district shall provide access to free, fresh, and clean drinking water during meal times through the use of drinking water access points, as defined. By imposing additional duties on school districts, this bill would impose a state-mandated local program.

This bill would require a school district that has drinking water sources with drinking water that does not meet the United States Environmental Protection Agency drinking water standards for lead or any other contaminant to close access to those drinking water sources, to provide alternative drinking water sources, as specified, and to notify specified persons if the school district is required to provide those alternative drinking water sources. By imposing additional duties on pupil schools and school districts, this bill would impose a state-mandated local program.

(2) Under existing law, known as the Lead-Safe Schools Protection Act, the State Department of Public Health is required to perform various activities related to reducing the risk of exposure

to lead hazards in public schools, including, among other activities, working with the State Department of Education to develop voluntary guidelines to ensure that lead hazards are minimized in the course of school repair and maintenance programs and abatement procedures.

This bill would repeal the requirement that the State Department of Public Health develop voluntary guidelines. The bill would instead require the State Department of Education to make information available to school districts about the United States Environmental Protection Agency's technical guidance for reducing lead in drinking water in schools. The bill would prohibit drinking water that does not meet the United States Environmental Protection Agency drinking water standards for lead from being provided at a school facility. The bill would require a public school that has lead-containing plumbing components to flush all drinking water sources at the beginning of each schoolday, except as provided. By imposing additional duties on public schools and school districts, this bill would impose a state-mandated local program.

(3) The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that, if the Commission on State Mandates determines that the bill contains costs mandated by the state, reimbursement for those costs shall be made pursuant to these statutory provisions.

The people of the State of California do enact as follows:

SECTION 1. Section 32241.5 is added to the Education Code, to read:

32241.5. The department shall make information available to school districts, by posting on its Internet Web site or through any other means for distributing information it deems effective, about the United States Environmental Protection Agency's technical guidance for reducing lead in drinking water in schools.

SEC. 2. Section 32242 of the Education Code is amended to read:

32242. The State Department of Public Health shall do all of the following:

(a) Design and implement a strategy for identifying the characteristics of high-risk schools and provide a basis for statewide estimates of the presence of lead in schools attended by young children.

(b) Conduct a sample survey, as described in Section 32241, to determine the likely extent and distribution of lead exposure to children from paint on the school, soil in play areas at the school, drinking water at the tap, and other potential sources identified by the State Department of Public Health for this purpose. To the maximum extent possible, limited sample testing shall be used to validate survey results. The State Department of Public Health shall compile and summarize the results of that survey and report those results to the Legislature and the department.

(c) Within 60 days of the completion of testing a schoolsite, the State Department of Public Health shall notify the principal of the school or director of the schoolsite of the survey results. Within 45 days of receiving the survey results, the principal or director, as the case may be, shall notify the teachers and other school personnel and parents of the survey results.

(d) Make recommendations to the Legislature and the department, based on the survey results and consideration of appropriate federal and state standards, on the feasibility and necessity of conducting statewide lead testing and any additional action needed relating to lead contamination in the schools.

(e) As deemed necessary and appropriate in view of the survey results, develop environmental lead testing methods and standards to ensure the scientific integrity of results, for use by schools and contractors designated by schools for that purpose.

(f) Evaluate the most current cost-effective lead abatement technologies.

SEC. 3. Section 32246 is added to the Education Code, to read:

32246. Drinking water that does not meet the United States Environmental Protection Agency drinking water standards for lead shall not be provided at a school facility.

SEC. 4. Section 32249 is added to the Education Code, to read:

32249. A school that has lead-containing plumbing components shall flush all drinking water sources at the beginning of each schoolday, consistent with protocols recommended by the United

States Environmental Protection Agency. A school is not required to flush drinking water sources that have been shut off or have been certified as meeting the United States Environmental Protection Agency's drinking water standards for lead.

SEC. 5. Section 38086 of the Education Code is amended to read:

38086. (a) A school district shall provide access to free, fresh, and clean drinking water during meal times in the food service areas of the schools under its jurisdiction, including, but not necessarily limited to, areas where reimbursable meals under the federal National School Lunch Program or the federal School Breakfast Program are served or consumed. A school district may comply with this section by, among other means, providing cups and containers of water or soliciting or receiving donated bottled water.

(b) A school district shall comply with this section through the use of drinking water access points.

(c) For purposes of this section, "drinking water access point" is defined as a station, plumbed or unplumbed, where pupils can access free, fresh, and clean drinking water. An unplumbed access point may include water bottles and portable water dispensers.

SEC. 6. Article 13 (commencing with Section 49580) is added to Chapter 9 of Part 27 of Division 4 of Title 2 of the Education Code, to read:

Article 13. Drinking Water

49580. (a) A school district that has drinking water sources with drinking water that does not meet the United States Environmental Protection Agency drinking water standards for lead or any other contaminant shall close access to those drinking water sources immediately upon receipt of test results or notification from the public water system.

(b) (1) If, as a result of closing access to a drinking water source pursuant to subdivision (a), a schoolsite within a school district no longer has the minimum number of drinking fountains required pursuant to Chapter 4 (commencing with Section 401.0) of the California Plumbing Code (Part 5 of Title 24 of the California Code of Regulations), the school district shall provide alternative drinking water sources at that schoolsite.

(2) An alternative drinking water source provided pursuant to this subdivision while the source of contamination is being mitigated may be from plumbed or unplumbed sources. Unplumbed sources may include, but are not limited to, portable water sources and bottled water.

(c) A school district shall notify parents or legal guardians, pupils, teachers, and other school personnel of drinking water test results, immediately upon receipt of those test results, if the school district is required to provide alternative drinking water sources.

SEC. 7. If the Commission on State Mandates determines that this act contains costs mandated by the state, reimbursement to local agencies and school districts for those costs shall be made pursuant to Part 7 (commencing with Section 17500) of Division 4 of Title 2 of the Government Code.

Approved ______________________________, 2015

____

Governor

ATTACHMENT

5

United States Environmental Protection Agency

3Ts for Reducing Lead in Drinking Water in Schools

Revised Technical Guidance

This October 2006 version of the 3Ts for Reducing Lead in Drinking Water in Schools: Revised Technical Guidance is a modification of the December 2005 version. The modifications in this version clarify the instructions for collecting samples from drinking water outlets, please see sections 4.2, 4.4.1, and 4.4.2. Additionally, EPA made some minor modifications to the nomenclature in Chapter 4. Please visit www.epa.gov/safewater/schools for the complete Errata sheet.

Disclaimer

This manual contains recommendations on how to address lead in school drinking water systems; these are suggestions only and are not requirements. This manual does, however, also contain an overview of requirements concerning lead in drinking water. The statutory provisions and regulations described in this document contain binding requirements. The general description here does not substitute for those laws or regulations; nor is this document a regulation itself. As a result, you will need to be familiar with the details of the rules that are relevant to your school drinking water; you cannot rely solely on this guidance for compliance information. Also, many states (or tribes) and localities have different, more stringent requirements than EPA's, so you will need to find out what other laws and regulations apply to school drinking water in addition to the ones described here.

3Ts for Reducing Lead in Drinking Water in Schools: *Revised* Technical Guidance

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Introduction

The Environmental Protection Agency (EPA) developed this guidance manual because the Agency is concerned about the potential for elevated lead levels in drinking water in schools. Children are most susceptible to the effects of lead, because their bodies are still undergoing development. The adverse health effects from lead include reduced IQ and attention span, learning disabilities, poor classroom performance, hyperactivity, behavioral problems, impaired growth, and hearing loss.

There is no federal law requiring testing of drinking water in schools, except for schools that have their own water supply and are thus regulated under the Safe Drinking Water Act (SDWA). The vast majority of public water suppliers do not include schools in their sampling plans because regulations (specifically the Lead and Copper Rule) require sampling of single family dwellings. States and local jurisdictions may, however, establish their own programs for testing drinking water lead levels in schools. EPA suggests that schools implement programs for reducing lead in drinking water as part of the school's overall plan for reducing environmental threats. Safe and healthy school environments foster healthy children, and may improve students' general performance.

Lead most frequently gets into drinking water by leaching from plumbing materials and fixtures as water moves through your school's distribution system. Even though the drinking water you receive from your water supplier meets federal and state standards for lead, your facility may have elevated lead levels due to plumbing materials and water use patterns. Because lead concentrations can change as water moves through the distribution system, the best way to know if a school might have elevated levels of lead in its drinking water is by testing the water in that school. Testing facilitates an evaluation of the plumbing and helps target remediation. It is a key step in understanding the problem, if there is one, and designing an appropriate response.

This guidance manual is intended for use by school officials responsible for the maintenance and/or safety of school facilities including the drinking water. The guidance introduces the 3Ts for reducing lead in drinking water. The 3Ts are:

- ***Training*** school officials to raise awareness of the potential occurrences, causes, and health effects of lead in drinking water; assist school officials in identifying potential areas where elevated lead may occur; and establishing a testing plan to identify and prioritize testing sites.

- ***Testing*** drinking water in schools to identify potential problems and take corrective actions as necessary.

- ***Telling*** students, parents, staff, and the larger community about monitoring programs, potential risks, the results of testing, and remediation actions.

The purpose of this manual is to help schools minimize their students' and staff's exposure to lead in drinking water. This manual is specifically targeted at schools that receive water from water utilities or water suppliers such as cities, towns and water districts. This guidance manual replaces the 1994 EPA guidance document *Lead in Drinking Water in Schools and Non-Residential Buildings*. By following the steps below, you will be assured your facility does not have elevated levels of lead in the drinking water.

Training

(1) Conduct a thorough review of this guidance document. Other reference documents are available. See Appendix B.

(2) Review available resources to find out what may already have been done and what assistance may be available to you. See Chapter 2.

(3) Develop a plumbing profile to assess the factors that contribute to lead contamination. See Chapter 3.

(4) Develop a drinking water sampling plan. See Chapter 3.

Testing

(5) Test the water. See Chapter 4.

(6) Correct any problems that are identified. See Chapter 5.

Telling

(7) Communicate to students, parents, staff, and the larger community about what you are doing to protect them from possible exposure to lead in drinking water. See Chapter 6.

I. Training

1. What You Should Know about Lead in Drinking Water

1.1 Health Effects of Lead

Lead is a toxic metal that is harmful to human health. Lead has no known value to the human body. The human body cannot tell the difference between lead and calcium, which is a mineral that strengthens the bones. Like calcium, lead remains in the bloodstream and body organs like muscle or brain for a few months. What is not excreted is absorbed into the bones, where it can collect for a lifetime.

Young children, those 6 years and younger, are at particular risk for lead exposure because they have frequent hand-to-mouth activity and absorb lead more easily than do adults. Children's nervous systems are still undergoing development and thus are more susceptible to the effects of toxic agents. Lead is also harmful to the developing fetuses of pregnant women.

No safe blood lead level in children has been determined. Lead can affect almost every organ and system in your body. The most sensitive is the central nervous system (brain), particularly in children. Lead also damages kidneys and the reproductive system. The effects are the same whether it is breathed or swallowed. Low blood levels of lead (those below 10 μg/dL) have been associated with reduced IQ and attention span, learning disabilities, poor classroom performance, hyperactivity, behavioral problems, impaired growth, and hearing loss. Very high lead level (blood lead levels above 70 μg/dL) can cause severe neurological problems such as coma, convulsions, and even death. The only method to determine a child's lead level is for them to have a blood lead test done by a health provider.

The degree of harm from lead exposure depends on a number of factors including the frequency, duration, and dose of the exposure(s) and individual susceptibility factors (e.g., age, previous exposure history, nutrition, and health). In addition, the degree of harm depends on one's total exposure to lead from all sources in the environment - air, soil, dust, food, and water. Lead in drinking water can be a significant contributor to overall exposure to lead, particularly for infants whose diet consists of liquids made with water, such as baby food, juice, or formula.

1.2 Sources of Lead

Lead is distributed in the environment through both natural and man-made means. Today, the greatest contributions of lead to the environment stem from past human activities. Sources of lead exposure include the following:

(1) **Lead based paint.** The most common sources of lead exposure for children are chips and particles of deteriorated lead paint. Although children may be exposed to lead from paint directly by swallowing paint chips, they are more often exposed by house dust or soil contaminated by leaded paint. Lead paint chips become ground into tiny bits that become part of the dust and soil in and around homes. This usually occurs when leaded paint deteriorates or is subject to friction or abrasion (as on doors and windowsills and window wells). In addition, lead can be dispersed when paint is disturbed during demolition, remodeling, paint removal, or preparation of painted surfaces for repainting.

(2) **Lead in the air.** Lead in the air comes from industrial emissions.

(3) **Lead in soil.** Lead deposits in soils around roadways and streets from past emissions by automobiles using leaded gas, together with paint chips and lead paint dust.

(4) **Lead industry.** Byproducts brought home by industrial workers on their clothes and shoes.

(5) **Lead in consumer products and food.** Lead may be found in some imported candies, medicines, dishes, toys, jewelry, and plastics.

(6) **Lead in water.** Lead in water occurs through corrosion of plumbing products containing lead.

The U.S. government has taken steps over the past several decades to dramatically reduce new sources of lead in the environment: by banning the manufacture and sale of leaded paint; by phasing out lead additives in gasoline, and by encouraging the phase-out of lead seams in food cans; by banning the sale of pipes and plumbing for drinking water that are not "lead-free"; and by banning lead-lined water coolers, among other activities. More recently, the government has begun to address persistent sources of lead in the environment. For example, programs have been instituted to minimize the hazards posed by lead paint covering millions of homes across the United States, more stringent air control standards are being applied to industries emitting lead, and more stringent regulations are in place to control lead in drinking water. Regulations affecting lead in drinking water are described at the end of this chapter.

1.3 How Lead Gets into Drinking Water

Lead can get into drinking water in two ways:

(1) by being present in the source water, such as coming from contaminated runoff or water pollution.

(2) through an interaction between the water and plumbing materials containing lead, such as through corrosion.

(1) At the Source

Most sources of drinking water have no lead or very low levels of lead (i.e., under 5 parts per billion). However, lead is a naturally occurring metal and in some instances can get into well water. Lead can enter surface waters (waters from rivers, lakes, or streams) through direct or indirect discharges from industrial or municipal wastewater treatment plants or when lead in air settles into water or onto city streets and eventually, via rain water, flows into storm sewers, or waterways, which may enter the water supply. Lead from these sources can be easily removed by existing treatment plant technologies.

(2) Through Corrosion

Most lead gets into drinking water after the water leaves the local well or treatment plant and comes into contact with plumbing materials containing lead. These include lead pipe and lead solder (commonly used until 1986) as well as faucets, valves, and other components made of brass. The physical/chemical interaction that occurs between the water and plumbing is referred to as corrosion. The extent to which corrosion occurs contributes to the amount of lead that can be released into the drinking water.

The ***critical issue*** is that even though your public water supplier may deliver water that meets all federal and state public health standards for lead, you may end up with too much lead in your drinking water because of the plumbing in your facility. The potential for lead to leach into water can increase the longer the water remains in contact with lead in plumbing. **As a result, facilities with intermittent water use patterns, such as schools, may have elevated lead concentrations**. **Testing drinking water in schools is important because children spend a significant portion of their day in these facilities and are likely to consume water while they are there.** That is why testing water from your drinking water outlets for lead is so important. Drinking water outlets are locations where water may be used for consumption, such as a drinking fountain, water faucet, or tap.

The corrosion of lead tends to occur more frequently in "soft" water (i.e., water that lathers soap easily) and acidic (low pH) water. Other factors, however, also contribute to the corrosion potential of the water and include water velocity and temperature, alkalinity, chlorine levels, the age and condition of plumbing, and the amount of time water is in contact with plumbing. The occurrence and rate of corrosion depend on the complex interaction between a number of these and other chemical, physical, and biological factors.

As illustrated in Exhibit 1.1, once the water leaves the public water supply system or treatment plant, drinking water comes into contact with 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. These components may or may not be owned by your water supplier.

Sediments containing lead may also collect in the low-lying sections of pipe or behind sediment screens. Lead-containing sediments may result from minute particles of pipe, mineral deposits (scales), valves, fixtures, solder, or flux that accumulate in the plumbing. This may happen during the initial construction of the plumbing system, during repairs, when connecting new fixtures, when plumbing is otherwise disturbed, or during normal use (e.g., turning of faucet handles, movement of valves, etc.). Sediment can also originate from the public water system's water mains and service taps.

If the public water supplier finds unacceptable levels of lead at customers' homes, the system may have to provide centralized treatment to minimize the corrosion of lead into the water (see "How Lead in Drinking Water is Regulated" in section 1.4). However, centralized treatment by a public water system does not guarantee that corrosion of lead from plumbing will not occur within buildings served by the public water system, i.e., your school.

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. Examples of some of the common drinking water outlets are shown in Exhibit 1.2. (The glossary in Appendix A provides definitions of the various drinking water outlets discussed in this document.) Although there is an increased probability that a given plumbing component installed prior to the 1990s could contain more lead than the newer components, the *occurrence of lead in drinking water can not be predicted based upon the age of the component or the school facility*.

Exhibit 1.1: Potential Sources of Lead in Schools

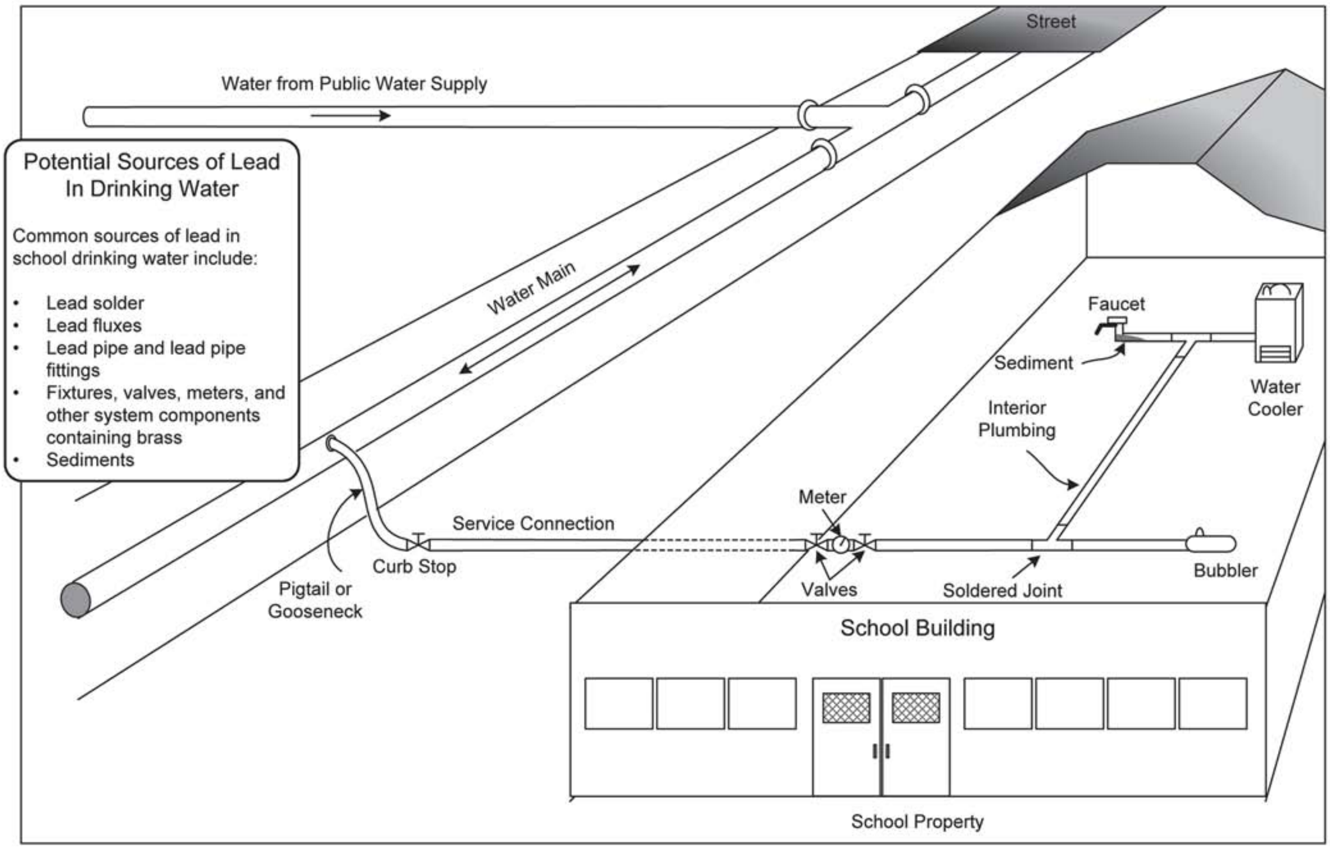
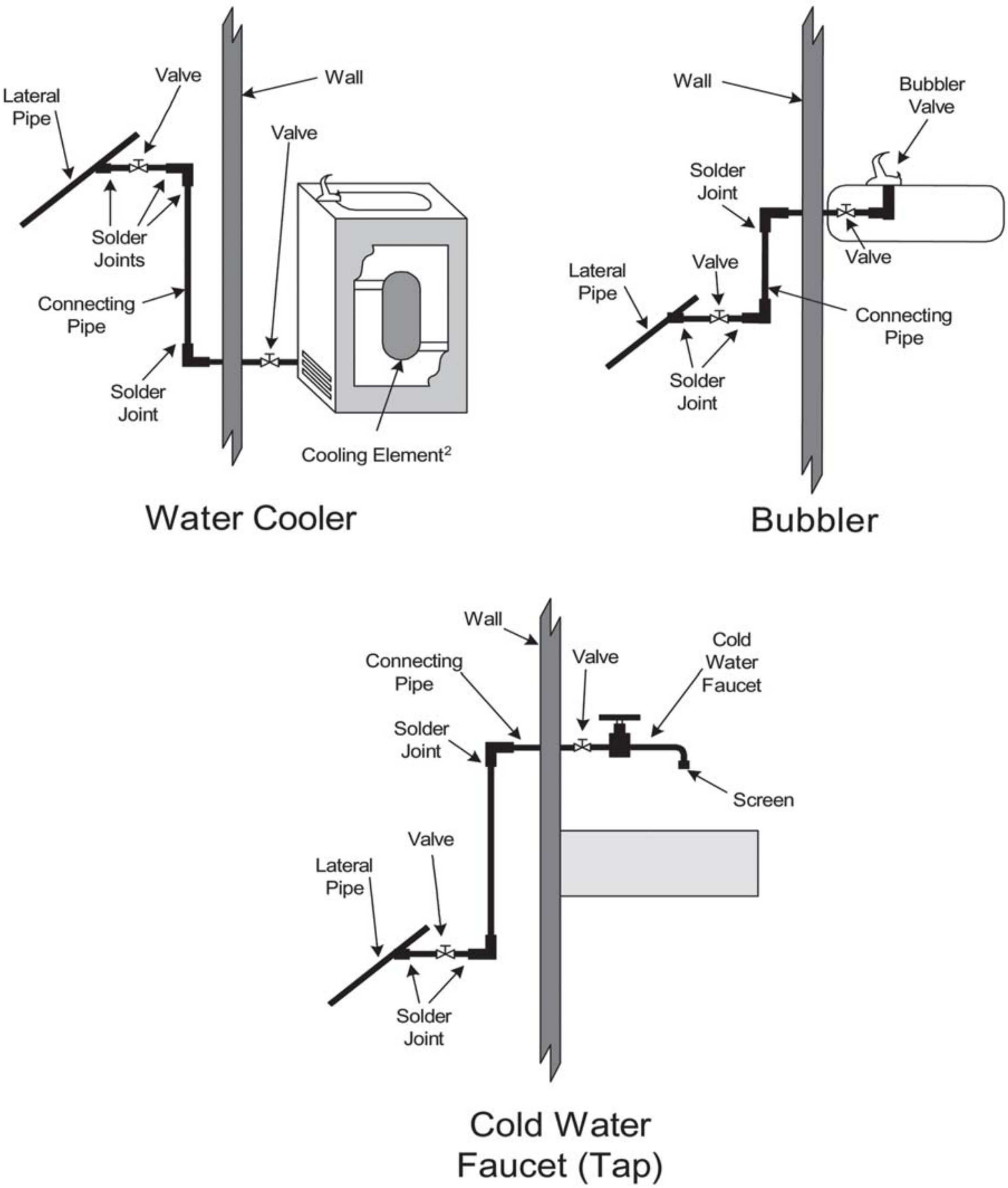


Exhibit 1.2: Common Drinking Water Outlets



[1]Valve locations are approximate and will vary, depending upon installation.
[2]Old cooling elements may be lead-lined. For more information on replacement of lead-lined cooling elements, see Appendix E of this document.

1.4 How Lead in Drinking Water is Regulated

Lead is regulated in public drinking water supplies under a federal law known as the Safe Drinking Water Act (SDWA). This Act was initially passed in 1974 and, in part, requires EPA to establish regulations for known or potential contaminants in drinking water for the purpose of protecting public health.

The requirements developed by EPA apply to **public water systems.** *Schools that are served by a public water system* (i.e., a drinking water system that they do not own or operate) are not subject to the SDWA monitoring and treatment requirements, because those schools do not meet the definition of a public water system. However, some states may have monitoring and treatment requirements for these schools. Nearly all states have a drinking water office that implements the SDWA on behalf of EPA. Questions regarding the regulation of your drinking water may be directed to the appropriate state drinking water program office (see Appendix D for a directory of state programs).

Additional requirements under the Safe Drinking Water Act include specific provisions for controlling lead in drinking water:

- **THE LEAD BAN (1986):** A requirement that only lead-free materials be used in new plumbing and in plumbing repairs.
- **THE LEAD CONTAMINATION CONTROL ACT (LCCA) (1988)**: The LCCA further amended the SDWA. The LCCA is aimed at the identification and reduction of lead in drinking water at schools and child care facilities. However, implementation and enforcement of the LCCA has been at each state's discretion. School monitoring and compliance has varied widely.
- **THE LEAD AND COPPER RULE (1991):** A regulation by EPA to minimize the corrosivity and amount of lead and copper in water supplied by public water systems.

The table below summarizes the significant elements of the SDWA with respect to lead in drinking water. Note that the 1991 Lead and Copper Rule *does not apply to schools that receive water from a public water system.*

Requirements Under the Safe Drinking Water Act

- **The 1986 SDWA Lead Ban.** This provision of the SDWA requires the use of "lead-free" pipe, solder, and flux in the installation or repair of any public water system *or* any plumbing in a residential or non-residential facility providing water for human consumption. Solders and flux are considered to be lead-free when they contain less than 0.2 percent lead. Before this ban took effect on June 19, 1986, solders used to join water pipes typically contained about 50 percent lead. Pipes and pipe fittings are considered "lead-free" under the Lead Ban when they contain less than 8 percent lead. Plumbing fixtures that are not "lead-free" were banned from sale after August 6, 1998. Plumbing fixtures are subject to the NSF International standard.

  NOTE: "Lead-free" pipe is allowed to contain up to 8 percent lead and "lead-free" solder and flux may contain up to 0.2 percent lead. Lead-free plumbing components are not necessarily "free" of lead.

- **The 1988 Lead Contamination Control Act (LCCA).** The purpose of the LCCA is to reduce lead exposure and the health risks associated with it by reducing lead levels in drinking water at schools and child care centers. The LCCA created lead monitoring and reporting requirements for all schools, and required the replacement of drinking water fixtures that contained excessive levels of lead (see Appendix E for a listing of these fixtures). The provisions are not enforceable. As a result, states have the option to voluntarily enforce the provisions of the Act (or alternate provisions) through their own authority.

- **The 1991 Lead and Copper Rule (LCR).** The LCR requires public water suppliers to monitor for lead in drinking water and to provide treatment for corrosive water if lead or copper are found at unacceptable levels. EPA strongly recommends that schools test their facilities for lead. However, unless a school owns its water system, testing for lead and copper within the school is not specifically required. Therefore, many schools served by water systems owned by cities, towns, or other entities may have never been tested for lead under the LCR.

Public Water Supply Testing vs. Testing at Schools

(15 ppb vs 20 ppb)

- It is important to note that the lead testing protocol used by public water systems is aimed at identifying system-wide problems rather than problems at outlets in individual buildings. Moreover, the protocols for sample size and sampling procedures are different. Under the LCR for public water systems, a lead action level of 15 parts per billion (ppb) is established for 1 liter samples taken by public water systems at high-risk residences. If more than 10 percent of the samples at residences exceed 15 ppb, system-wide corrosion control treatment may be necessary. The 15 ppb action level for public water systems is therefore a trigger for treatment rather than an exposure level.

- EPA recommends that schools collect 250 mL first-draw samples (i.e., samples of stagnant water before any flushing or use occurs) from water fountains and other outlets used for consumption, and that the water fountains and/or outlets be taken out of service if the lead level exceeded 20 ppb. The sample was designed to pinpoint specific fountains and outlets that require remediation (e.g. water cooler replacement). The school sampling protocol maximizes the likelihood that the highest concentrations of lead are found because the first 250 mL are analyzed for lead after overnight stagnation.

2. Planning Your Program and Establishing Partnerships

Monitoring for lead in your school's drinking water is extremely important. If you have never or have not recently monitored for lead in your school's drinking water, you are encouraged to begin the process by identifying any lead problems that you may have in your drinking water. 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.

2.1 Assigning Roles

Your school should assign responsibility to a key individual(s) to ensure that testing and follow-up actions are completed. A person should also be appointed to serve as the contact person for communication with interested parties (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.

If your school decides to use consultants or lab personnel, their roles should be defined with respect to the responsible person(s) at the school. Contact your state drinking water program or local health department if you need advice on how to identify a qualified consultant.

2.2 School Records

To determine if previous monitoring efforts have been made at your school, you should review your school records. Some schools conducted voluntary monitoring in cooperation with state or local officials in response to the 1988 Lead Contamination Control Act (LCCA). Other schools may have sampled for lead in response to state requirements. This information will be useful in filling out your Plumbing Profile Questionnaire (see Chapter 3), a tool that may be used to help determine whether lead is likely to be a problem in your facility. Records should also be reviewed to determine whether remediation actions have been taken. For example, have water coolers that contain lead been replaced (see Appendix E for a listing of banned water coolers)? While these records may not make additional testing or remediation unnecessary, they will help to prioritize your efforts and make them more efficient.

If testing or remediation was conducted in response to the 1988 Lead Contamination Control Act, it may have taken place 10 years ago or more. If you are not familiar with what activities may have taken place at your school and your records are incomplete or absent, you are encouraged to contact individuals that may have been involved in the past. Personnel that were involved may remember activities that were not well-documented. They may also remember whether other agencies or the local public water supplier were involved, which may mean that additional records are available.

2.3 Establishing Partnerships

2.3.1 Assistance from Your Public Water Supplier

Some public water suppliers have devoted resources to helping schools conduct testing for lead even though they may not be legally required to do so. As discussed in the previous chapter, public water suppliers are required by the Lead and Copper Rule to monitor for lead at customers' taps. However, testing at schools was not specifically required unless the public water system was owned and operated by the school. Therefore, unless a school served by a public water system tested for lead on its own, or had testing voluntarily conducted by the public water system, neither the school nor the public water system is likely to have any record of testing. Although the public water system may treat the water to minimize corrosion, it is very important that you test to determine to what extent lead is leaching from plumbing within the school.

You are encouraged to contact your public water supplier to determine whether assistance or information on previous efforts is available. Although utilities are under no obligation to do so, assistance may be available through technical guidance, sampling, or sharing in sampling costs. Some utilities may be willing to help develop sampling plans (see Chapter 3) and plumbing profiles (see Chapter 3). The American Water Works Association (AWWA), a non-profit organization of water system professionals, recently prepared a summary of information for water suppliers on options for providing assistance to schools.

You should obtain the results of your water supplier's required monitoring under the Lead and Copper Rule to determine whether they are in compliance with the requirements of the Lead and Copper Rule. Your water utility should be able to tell you whether lead monitoring is current, whether the monitoring results are below the lead action level, and whether corrosion control treatment is provided. Your water supplier should also be able to tell you whether they have conducted lead monitoring at your school, and they may be able to give you some indication of whether lead could be a problem within your building(s).

You may wish to begin by contacting your local director of public works, water superintendent, or water department, depending upon how your utility is organized. Some utilities have Web sites with contact information. All public water suppliers are required to produce and distribute an annual Consumer Confidence Report (CCR). You may want to get in the habit of thoroughly reviewing your utility's CCR for important information about the water chemistry and overall water quality. Changes in water chemistry or quality may affect your school's long-term sampling plan. The CCR also provides the name(s) and contact information for those at your utility who may be able to answer any questions you have.

Questions to Ask Your Drinking Water Supplier

It is important to know who supplies your facility's drinking water, and whether and how the water entering your facility is treated. Some kinds of treatment can make the water more corrosive, while others will reduce the problem. If the water is corrosive, treatment can reduce lead levels throughout the system and can save you and the supplier money by reducing damage to plumbing. The following are some questions you may want to ask your public water supplier:

- Ask for a copy of the most recent annual water quality report (CCR).
- Is the water system in compliance with federal and state standards for lead monitoring and treatment?
- What steps have been taken to maintain compliance with the Lead and Copper Rule?
- Does the utility have sample results from the school?
- Is the water corrosive? If so, what is the system doing to minimize corrosion?
- If a corrosion control chemical is used, does the chemical form a protective coating inside the piping?
- Does the water distribution system have any lead piping (for example, lead gooseneck at service connections), and does the system plan to remove these sources of lead?

2.3.2 Assistance from Your Local Health Office

Many local governments have established programs that are responsible for a wide variety of public health protection activities, such as a Lead Poisoning Prevention Program. These programs are often the first line of defense when public health risks arise. Lead programs for children are often a high priority for local health offices.

You may wish to contact the local health office to discuss your needs. Although resources may be limited, the office may be willing to provide assistance in a variety of ways. For example, a representative may be able to attend Parent and Teacher Association meetings to discuss potential health effects, as well as to act as a contact with state programs to obtain information and assistance. A representative may even be able to assist in developing the plumbing profile, conducting sampling, or in taking follow-up action.

The phone number for your local health office should be in the listings under your county or city government. Many offices also have a Web site. The following Web site contains information about many local health departments listed by state http://www.healthguideusa.org/local_health_departments.htm.

2.3.3 Assistance from Your State Drinking Water Program

As discussed in Chapter 1, the only federal requirement that applies uniformly to schools that receive water from a public water system is the ban on the installation of water system components that are not lead-free (the Lead Ban).

You are encouraged to contact your state program to determine whether any other requirements apply, or whether technical assistance is available. The drinking water program may be housed in the department of health or the department of the environment. A listing of state program contacts is contained in Appendix D. Most state programs also have Web sites with contact information. The following Web site contains information about many state health departments http://www.healthguideusa.org/state_health_departments.htm. When discussing the issue with your state program, you may wish to request assistance with voluntary compliance with the Lead Contamination Control Act. Since most state programs are familiar with the Act, this should help to clarify your request.

If you have not been able to make contact with your local public water supplier, you may also wish to ask whether the state program can provide information on monitoring compliance, results, and treatment. Your state program regulates all such water suppliers for compliance with the Lead and Copper Rule, and therefore should have this information readily available.

You may also wish to ask the state drinking water program staff about other state programs that are involved in reducing lead risks for children. There may be an interest in developing a cooperative effort between state programs or between state and local agencies.

2.3.4 Assistance from Certified Laboratories

Your state drinking water office should be able to provide a list of certified laboratories in your area. You should only use a laboratory that is certified by the state or EPA for testing lead in drinking water for public water systems.

Some laboratories will provide assistance in addressing the activities described in this manual. For example, some laboratories will collect samples for clients to ensure proper sampling technique and sample preservation. However, costs for services will vary and you may wish to contact several certified labs.

If outside laboratory personnel are used, you should ensure that they understand the testing procedures described in this manual because these procedures differ from those used by public water suppliers for compliance with the Lead and Copper Rule.

2.3.5 Assistance from Local Community Organizations

Your community has a variety of local organizations that can help; for example community volunteer groups, senior citizens groups, the Parent and Teacher Associations, and local environmental groups. Tap into the expertise of people in your community who may be able to help with all aspects of your lead in drinking water reduction program. Another useful resource is your region's Pediatric Environmental Health Speciality Unit (PEHSU). Your region's PEHSU may be able to provide risk communication support to school districts; for more information please visit http://www.aoec.org/PEHSU.org.

Contacting these groups is another way for your school to foster support. These groups might be willing to volunteer time to collect samples and train others to collect samples.

II. Testing

3. Assessment and Strategy: Plumbing Profile and Sampling Plan

3.1 Development of a Plumbing Profile for Your Facility's Plumbing

Before testing and correcting lead problems, it is important to target potential problems and 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 may be recommended for each. A plumbing profile can be created by answering a series of questions about your facility's plumbing. 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 sample sites. EPA recommends the following sites as priority sample sites: drinking fountains (both bubbler and water cooler style), 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.

Exhibit 3.1 provides a plumbing profile questionnaire discussion and interpretations of possible answers designed to help you plan your testing strategy and develop your sampling plan. Planning your strategy will enable you to conduct testing in a cost-efficient manner. For a blank copy of the plumbing profile questionnaire, see Appendix I.

Exhibit 3.1: Plumbing Profile Questionnaire

Plumbing Profile Questions	What Your Answers to the Plumbing Profile Questions Mean
The questions in this column will help you determine whether lead is likely to be a problem in your facility, and will enable you to prioritize your sampling effort.	This column discusses the significance of possible answers to the plumbing profile questions.
1. When was the original building constructed? Were any buildings or additions added to the original facility? If so, complete a separate plumbing profile for each building, addition, or wing.	**Older Buildings** – Through the early 1900s, lead pipes were commonly used for interior plumbing in certain parts of the country in public buildings and private homes. Plumbing installed before 1930 is more likely to contain lead than newer pipes. Between 1920 and 1950, galvanized pipes were also used for plumbing. After 1930, copper generally replaced lead as the most commonly used material for water pipes. Up until the mid- to late-1980s (until the lead-free requirements of the 1986 Safe Drinking Water Act Amendments took effect), lead solder was typically used to join these copper pipes. The efforts of your public water supplier over the years to minimize the corrosiveness of the water may have resulted in mineral deposits forming a coating on the inside of the water pipes (passivation). This coating insulates the water from the plumbing and results in decreased lead levels in water. If the coating does not exist or is disturbed, the water is in direct contact with any lead in the plumbing system. **Newer Buildings –** New buildings are not likely to have lead pipes in their plumbing systems, but they are very likely to have copper pipes with solder joints. Buildings constructed prior to the late 1980s, before the lead-free requirements of the 1986 Safe Drinking Water Act Amendments, may have joints made of lead solder. Buildings constructed after this period should have joints made of lead-free solders. Even if "lead-free" materials were used in new construction and/or plumbing repairs, lead leaching may occur.

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? In some areas of the country, it is possible that high-lead materials were used until 1988 or perhaps even later. Your local plumbing code authority or building inspector may be able to provide guidance regarding when high-lead materials were last used on a regular basis in your area.	The 1986 Amendments to the Safe Drinking Water Act banned plumbing components that contained elevated levels of lead. Lead-free solder and flux (not more than 0.2% lead) and pipe, pipe fittings, and fixtures (not more than 8% lead) must now be used. The leaching potential of lead-free (i.e., tin-antimony) solder is much less than lead solder. The leaching potential of lead-free pipe, pipe fittings, and fixtures is also less, but leaching is still possible. If lead-free materials were not used in new construction and/or plumbing repairs, elevated lead levels can be produced. If the film resulting from passivation does not exist or has not yet adequately formed, any lead that is present is in direct contact with the water.
3. When were the most recent plumbing repairs made (note locations)?	Corrosion occurs (1) as a reaction between the water and the pipes and (2) as a reaction between the copper and solder (metal-to-metal). This latter reaction is known as galvanic corrosion, which can be vigorous in new piping. If lead solders were used in the piping or if brass faucets, valves, and fittings containing alloys of lead were installed *(see response to Question 8 below for further discussion of brass)*, lead levels in the water may be high. After about 5 years, however, this type of reaction (galvanic corrosion) slows down and lead gets into water mainly as a result of water being corrosive. If the water is non-corrosive, passivation is likely to have occurred and to have reduced opportunities for lead to get into the water system. For these reasons, if the building (or an addition, new plumbing, or repair) is less than 5 years old and lead solder or other materials (e.g., brass faucets containing lead alloys) were used, you may have elevated lead levels. If water supplied to the building is corrosive, lead can remain a problem regardless of the plumbing's age.

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.	Lead piping was often used for the service connections that join buildings to public water systems. The service connection is the pipe that carries drinking water from a public water main to a building. Some localities actually required the use of lead service connections up until the lead-free requirements of the 1986 Safe Drinking Water Act Amendments took effect. Although a protective layering of minerals may have formed on these pipes, vibrations can cause flaking of any protective build-up and, thus, allow lead contamination to occur.
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.	Survey your building for exposed pipes, preferably accompanied by an experienced plumber who should be able to readily identify the composition of pipes on site. Most buildings have a combination of different plumbing materials: • Lead pipes are dull gray in color and may be easily scratched by an object such as a knife or key. Lead pipes are a major source of lead contamination in drinking water. • Galvanized metal pipes are gray or silver-gray in color and are usually fitted together with threaded joints. In some instances, compounds containing lead have been used to seal the threads joining the pipes. Debris from this material, which has fallen inside the pipes, may be a source of contamination. • Copper pipes are red-brown in color. Corroded portions may show green deposits. Copper pipe joints were typically joined together with lead solders until the lead-free requirements of the 1986 Safe Drinking Water Act Amendments took effect. • Plastic pipes, especially those manufactured abroad, may contain lead. If plastic pipes are used, be sure they meet NSF International standards. *(Note: NSF International is an independent, third-party testing organization. Product listings can be obtained by visiting their Web site at http://www.nsf.org/business/search_listings/index/asp.)*
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.	Some older tanks may contain coatings that are high in lead content. Tanks may accumulate sediment that could be flushed back into the plumbing system under certain circumstances. You may wish to contact the supplier or manufacturer to obtain information about coatings. You may also wish to hire a plumber or tank service contractor to inspect your tanks, especially gravity storage tanks that are located outside of the building.

7. Was lead solder used in your plumbing system? Note the locations of lead solder.	The 1986 Amendments to the Safe Drinking Water Act banned plumbing components that contained high levels of lead. Lead-free solder and flux (not more than 0.2% lead) must now be used. The leaching potential of lead-free (i.e. tin-antimony) solder is much less than lead solder. It is likely that high-lead solder and fluxes continued to be used until 1988 and even later in some areas of the country. Your local plumbing code authority or building inspector may be able to provide guidance regarding when high-lead solder was last used on a regular basis in your area.
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.	Brass fittings, faucets, and valves are golden yellow in color, similar to copper in appearance, or are plated with chrome. Brass is composed primarily of two metals, copper and zinc. Most brasses contain lead ranging from 2 percent to 8 percent. That lead can contaminate the water contact surface when it is smeared on the machined surfaces during production. After 1996, brass fittings installed in drinking water outlets such as faucets and water coolers must meet NSF standards for lead content. While this percentage is considered lead-free under the 1986 Safe Drinking Water Act Amendments, some contamination problems still may occur. Older brass faucets may contain higher percentages of lead and lead solder in their interior construction and pose contamination problems. Note that your state or local government may have imposed this standard prior to 1988. The degree to which lead will leach from brass products containing alloys with less than 8 percent lead is dependent upon the corrosiveness of the water and the manufacturing process used to develop the product. A study revealed that fabricated faucets tend to contribute less lead to the water than faucets manufactured by the permanent mold process, regardless of the amount of lead in the alloy. In response to a requirement of the 1996 SDWA, EPA worked with the plumbing industry and NSF International to develop a voluntary industry standard that is designed to minimize the amounts of lead being leached from these products. This standard is NSF/ANSI Standard 61, Section 9. Since 1998, all plumbing fixtures for use as drinking water supply must meet this standard. You should require NSF/ANSI 61 certification on all drinking water system products purchased. Include a copy of the NSF/ANSI 61 certificate as a requirement on your purchase orders. The distributor or manufacturer can provide you with a list of certified products. You should require NSF/ANSI 61 certification on all drinking water system products used in new construction and inform your architects and revise your building specifications.

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	In addition to lead components in the plumbing system, lead solders or lead in the brass fittings and valves used in some taps, bubblers, and refrigerated water coolers may be sources of lead. It is important to identify the locations of all such drinking water outlets. Faucets in restrooms should not be used to obtain water for drinking. Although they may be adequate for washing hands, they may not be appropriate for drinking purposes. You may consider posting “do not drink” signs.
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? Note the locations of any banned coolers.	Water coolers may be a major source of lead contamination. The Federal Consumer Product Safety Commission negotiated an agreement with Halsey Taylor through a consent order agreement published in June 1990 to provide a replacement or refund program that addresses all the water coolers listed by EPA as having lead-lined tanks. Halsey Taylor was the only company identified by EPA as manufacturing some water coolers with lead-lined tanks. Additionally, some coolers manufactured by EBCO had a bubbler valve and one soldered joint that contained lead. See Appendix E of this manual for a summary of EPA’s list of water coolers found to contain lead. Use the list to help prioritize your sampling. If your water cooler is listed as having a lead-lined tank, you should not use the water for drinking, and you should remove the cooler immediately as these coolers pose the highest risk of contamination.
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. 12. Have these screens been cleaned? Note the locations.	Lead-containing sediments that are trapped on screens can be a significant source of lead contamination. Sediments should be tested for the presence of lead, and your facility should create a routine maintenance program to clean the screens frequently. If sediment has been a reoccurring problem regular cleaning of the screens and additional investigating into why the debris is accumulating is appropriate. However, the manufacturer or water service provider should be contacted to obtain instructions.
13. Can you detect signs of corrosion, such as frequent leaks, rust-colored water, or stained dishes or laundry? Note the locations.	Frequent leaks, rust-colored water, and stains on fixtures, dishes, and laundry are signs of corrosive water. Blue-green deposits on pipes and sinks indicate copper corrosion; brown stains result from the corrosion of iron. Where such symptoms occur, high levels of lead, copper, and iron may be present in the water. Lead can accumulate with iron, which can form sediments that are hard to remove.

14. Is any electrical equipment grounded to water pipes? Note the locations.	If electrical equipment, such as telephones, has been installed using water pipes as a ground, the electric current traveling through the ground wire will accelerate the corrosion of any interior plumbing containing lead. The practice should be avoided, if possible. However, if existing wires are already grounded to water pipes, the wires *should not be removed* from the pipes unless a qualified electrician installs an alternative grounding system. Check with your local building inspector on this matter. Your state or local building code may require grounding of the wires to the water pipes. **Improper grounding of electrical equipment may cause severe shock.**
15. Have there been any complaints about water taste (metallic, etc.) or rusty appearance? Note the locations.	Although you cannot see, taste, or smell lead dissolved in water, the presence of a metallic taste or rusty appearance may indicate corrosion and possible lead contamination.
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?	As discussed previously, lead testing may have previously been done voluntarily under the Lead Contamination Control Act. Results of analyses of general water quality, such as measures of pH, calcium hardness, and carbonate alkalinity, can provide important clues about the corrosiveness of the water. Generally, the higher the values of these parameters, the less likely it is that your water is corrosive. If you have no data from your school, your public water system should at least be able to provide information about the general water quality.
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?	You should incorporate this information into decisions regarding sample locations and sampling protocol. You may wish to note the direction of water flow and the location of fixtures, valves, tanks, areas of sediment accumulation, areas of corrosion, etc., on a sketch or blueprint of the plumbing.

Now that you understand the potential dangers of lead contamination in drinking water and the laws and programs in place to address this problem, it is time to begin development of a plumbing profile and a sampling plan.

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

As discussed in Chapter 2, it is important to designate a school employee(s) to take responsibility of the sampling program and follow-up activities, even if someone else is hired to conduct testing. If laboratory representatives or consultants are used to conduct testing, you should ensure that they have experience in conducting lead testing at schools. You may wish to ask the laboratory or consultant for references. Contact your state or local health department or drinking water program if you need advice on how to identify a qualified consultant.

3.3 Where Should I Sample? - Determining Sample Locations

You must decide where to take samples and how to prioritize the sample sites based on your responses to the plumbing profile and your knowledge of the facility. If possible, every outlet used for drinking or cooking should be sampled. *At a minimum*, every outlet that is regularly used for cooking and drinking should be sampled. Sample sites that are most likely to have lead contamination include:

- Areas containing 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 EPA (See Appendix E) as having lead-lined storage tanks or lead parts. These should be removed.

It may be helpful to diagram the plumbing in your facility and the outlets that will require testing. Examples of plumbing configurations for a single-level building and a multi-level building are illustrated in Exhibits 3.2 and 3.3, respectively. Locate service connections, headers, laterals, loops, drinking water fountains (bubblers and coolers), riser pipes and different drinking water loops *(see Appendix A for a glossary of these plumbing terms)*, and decide in what order you wish to take samples.

As shown in the above-mentioned Exhibits, water is carried to the different floors in a multi-level building by one or more riser pipes. Water from the riser pipes is usually distributed through several different drinking water loops. In addition, in some buildings, water may be stored in a tank prior to distribution. In single-story buildings, the water comes from the service connection via main plumbing branches, often called headers. These, in turn, supply water to laterals. Smaller plumbing connections from the laterals and loops supply water to the faucets, drinking water fountains, and other outlets. For sampling purposes, water within a plumbing system moves “downstream” from the source (i.e., from the distribution main in the street through the service connection and through the building).

3.4 Who Should Collect the Samples and Where Do Samples Go for Analysis? - Collection and Analysis of Samples

Deciding who will collect samples will be based, in part, on who will analyze the samples. Choosing an individual who is adequately trained to collect samples may help avoid sampling errors. Some state drinking water programs or public water suppliers may provide both services, although there is no federal requirement that they do so. Regardless of who collects the samples, you should employ a certified laboratory to conduct sample analyses. Contact your state drinking water program (Appendix D) or EPA's Safe Drinking Water Hotline (Appendix B and C) for a list of certified laboratories in your area. Consider the following issues prior to making a selection:

- Will the laboratory take samples for you or will they provide training and sample containers for collectors designated by you? (Testing activities can be useless if sample collectors do not follow proper sampling procedures.)
- If it is determined that a laboratory or other consultant will take your samples, make sure they understand the sample protocol. This protocol is described in the next section. *Make sure that laboratories or consultants thoroughly understand this protocol and do not confuse it with the lead testing protocol used by public water suppliers*. The two protocol are different.
- What is the cost of the laboratory's services? Costs will vary, depending upon the extent of the services to be provided (e.g., if only analyses are conducted or if other services such as sample collection are provided). You may want to contact several laboratories to compare prices and services, and you may wish to combine your sampling with another school to obtain a cheaper analysis rate.
- What is the laboratory's time frame for providing sample results?
- Recordkeeping is a crucial activity. *Appendix F contains a sample recordkeeping form and identifies the type of information you should consider recording.*
- Establish a written agreement or contract with the laboratory for all of the services to be provided.

Exhibit 3.2: Plumbing Configuration for a Single-Level Building

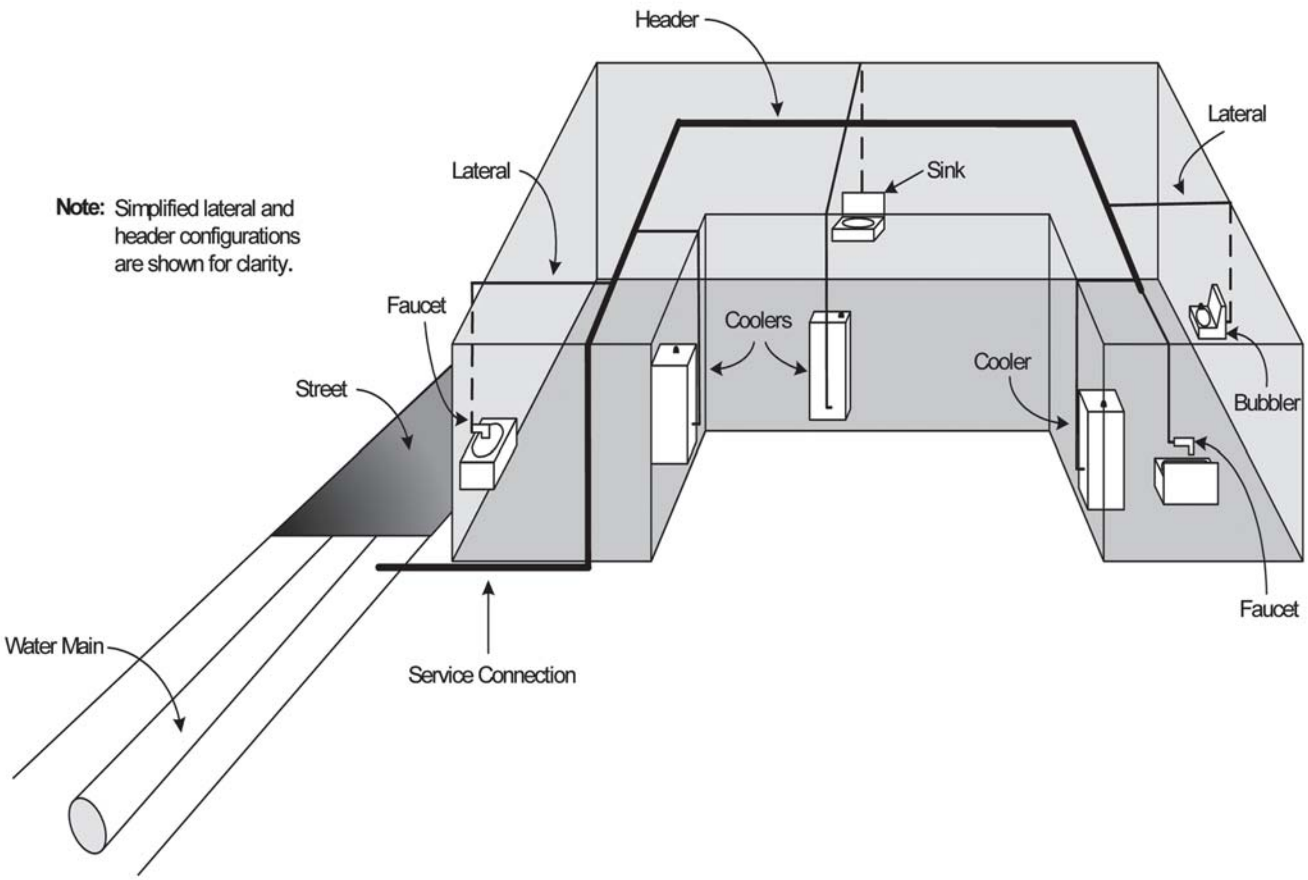
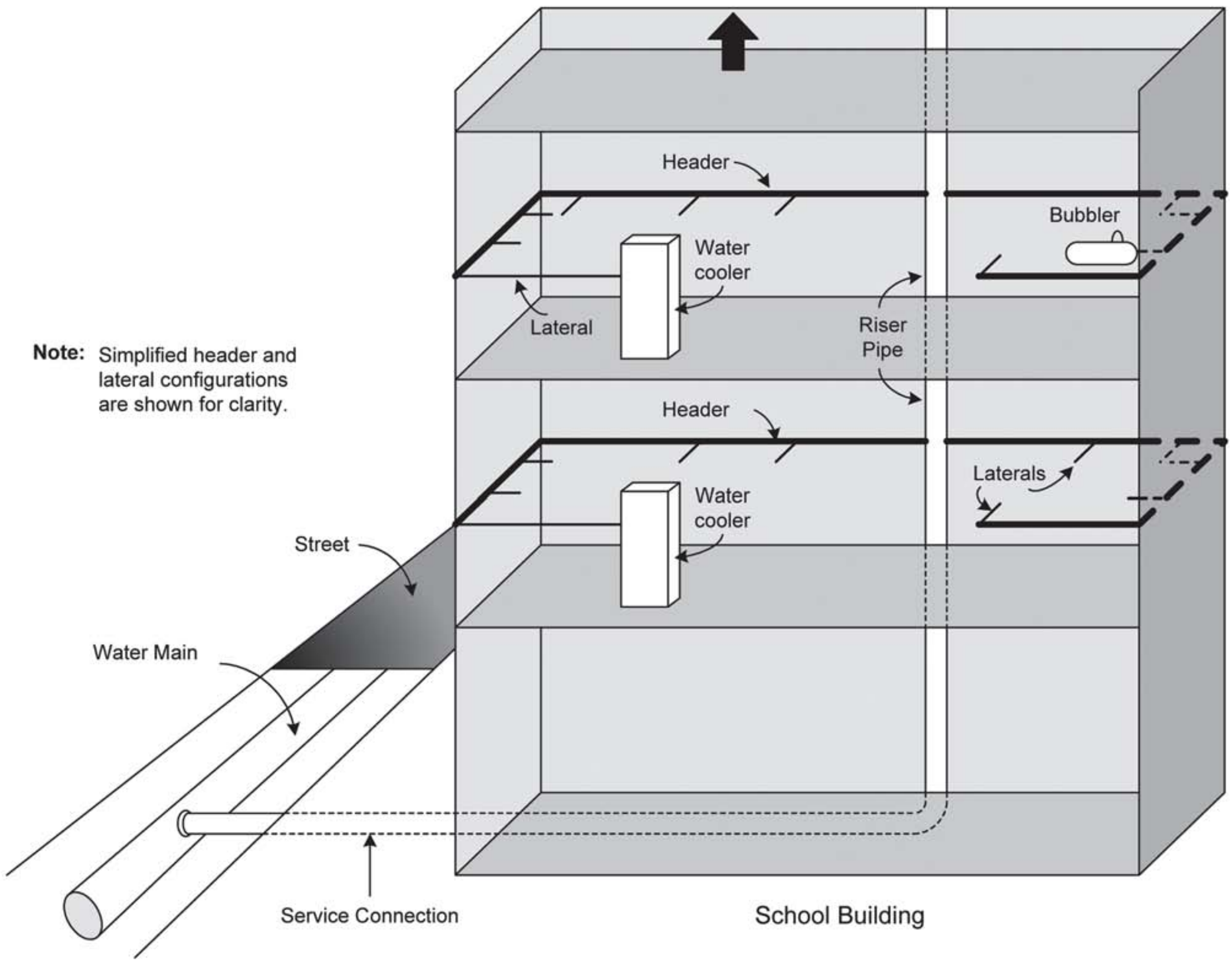


Exhibit 3.3: Plumbing Configuration for a Multi-Level Building



4. Conducting Sampling

4.1 General Sampling Procedures

This section outlines the general procedures involved in collecting drinking water samples for lead testing, and the two-step sampling process for sampling at your school. Please note that the general two-step sampling process in this chapter contains recommendations for sampling that were created for typical plumbing configurations. If you believe that the recommendations do not fit your specific site conditions, you may wish to modify them as appropriate. See additional discussion in 4.4.3. **EPA strongly recommends that all water outlets in all schools that provide water for drinking or cooking meet a standard of 20 parts per billion (ppb) lead or less.**

4.2 Collection Procedures

(1) All water samples collected should be 250 milliliters (mL) in volume. School samples are smaller than the one liter sample collected by public water suppliers for compliance with the Lead and Copper Rule. A smaller sample is more effective at identifying the sources of lead at an outlet because a smaller sample represents a smaller section of plumbing. A smaller sample is also more representative of water per serving consumed by a child. A 250 mL sample from a faucet would not include portions of the plumbing behind the wall that the faucet is mounted on, for example, compared to a 1000 mL (1 liter) sample, which would include a longer line of plumbing with its valves and tees and elbows and soldered joints.

(2) Collect all water samples before the facility opens and before any water is used. Ideally, the water should sit in the pipes unused for at least 8 hours but not more than 18 hours before a sample is taken. However, water may be more than 18 hours old at some outlets that are infrequently used. If this is typical of normal use patterns, then these outlets should still be sampled.

(3) Make sure that no water is withdrawn from the taps or fountains from which the samples are to be collected prior to their sampling.

(4) Unless specifically directed to do so, do not collect samples in the morning after vacations, weekends, or holidays because the water will have remained stagnant for too long and would not represent the water used for drinking during most of the days of the week.

(5) Assign a unique sample identification number to each sample collected - use your sampling plan schematic or numbering system. Record the identification number on the sample bottle and on your recordkeeping form *(see Appendix F)*. On your recordkeeping form include information on:

- Type of sample taken, e.g., initial first draw, follow-up flush, etc.
- Date and time of collection.
- Name of the sample collector.
- Location of the sample site.
- Name of the manufacturer that produced the outlet, and the outlet's model number, if known.

Consult the sample form in Appendix F for additional recordkeeping items.

4.3 Laboratory Analysis and Handling of Sample Containers

As discussed in the previous chapter, the certified drinking water lab that you select will either collect the samples for you or they will provide you with materials and instructions if you plan to collect your own samples.

If you collect your own samples, follow the instructions provided by the laboratory for handling sample containers to ensure accurate results (*also see Appendix G – Preservation of Samples and Sample Containers*). Make sure the containers are kept sealed between the time of their preparation by the lab and the collection of the sample. Be sure to carefully follow the laboratory's instructions for preservation of the samples. Icing or refrigeration of the samples will likely be necessary. Most laboratories will provide shipping containers and ice packs if shipping is necessary.

> When the laboratory returns your test results, the concentrations of lead in your drinking water samples will be reported in metric form such as milligrams per liter (mg/L) or micrograms per liter (µg/L), or they will be reported as a concentration such as parts per million (ppm) or parts per billion (ppb), respectively.
>
> Milligrams per liter (mg/L) is essentially the same as parts per million (ppm). Micrograms per liter (µg/L) is essentially the same as parts per billion (ppb).
>
> **Examples: 1 mg/L = 1000 µg/L = 1ppm =1000ppb; 0.020 mg/L = 20 µg/L = 0.02ppm = 20ppb**

4.4 Overview of the Two-Step Sampling Process

EPA 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 (the faucet, bubbler etc.), plumbing upstream of the outlet fixture (pipe, joints, valves, fittings etc.), or it can already be in the water that is entering the facility. The two-step sampling process helps to identify the actual source(s) of lead.

In Step 1, initial samples are collected to identify the location of outlets providing water with elevated lead levels and to learn the level of the lead in the water entering the facility (i.e., at the service connection). In Step 2, follow-up flush samples are taken only 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 determine the sources of lead contamination and to determine appropriate corrective measures.

The protocol, which consists of an established sample size volume and water retention time, is designed to identify lead problems at outlets and upstream plumbing within school facilities, and in the water entering the facility.

This section provides a brief definition and overview of the purpose of each of the two steps in EPA's lead testing process.

4.4.1 Step 1: Initial Sampling

In Step 1, initial samples are taken from prioritized outlets (e.g., bubblers, fountains) 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). A sample is also collected from a tap located as near as possible to the service connection (i.e., the pipe connecting your facility to a larger water main). Initial service connection samples are flush samples, but the initial samples taken from bubblers, fountains, and other outlets used for consumption are all first-draw samples (i.e., the stagnant water is sampled before **any** flushing or use occurs). The goal of Step 1 is to compare the lead level of water from your facility's service connection to water that has remained stagnant between 8 and 18 hours in an outlet or fixture.

TIP: Some schools may opt to clean the aerators prior to collecting initial first draw samples. However, EPA recommends that the collection of first draw samples without aerators should only be permissible if the outlet does not normally have an aerator, or if your school has a documented routine maintenance program for removing, cleaning, and replacing aerators on drinking water outlets. If your school does not have an aerator maintenance program in place, removing, cleaning, and replacing the aerators prior to sampling for diagnostic purposes will provide sampling results that cannot be assured to represent the water that the children and staff are routinely drinking from the outlet.

To determine the lead content in water from your facility's service connection, first contact your public water supplier to identify what lead levels you might expect. *(If you completed the plumbing profile questionnaire in Appendix I that is also discussed in Exhibit 3.1, you will already have this information.)* Second, test water that is representative of your service connection and the mains in your public water system. Compare the results to determine what contribution your service connection is making to lead concentrations in your building (see Exhibit 4.3). Then, compare this finding to the results from outlets in the facility. For sampling instructions for initial samples from service connections, mains, and different types of water outlets, see Exhibits 4.3 through 4.9.

Before beginning sampling, you should repair any leaking outlets to ensure that you collect representative samples.

4.4.2 Step 2: Follow-Up Flush Sampling

If initial test results reveal lead concentrations greater than 20 ppb in a 250 mL sample for a given outlet, 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. EPA has established this trigger for follow-up flush testing to ensure that the sources of lead contamination in drinking water outlets are identified. The table below provides details of an additional sub-step that might be taken to eliminate particulate debris that can collect on aerators and screens as a source of lead.

In Step 2, follow-up flush samples are collected and analyzed from outlets whose initial first draw results revealed lead concentrations greater than 20 ppb. The purpose of Step 2 is 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 generally involve the collection of water from an outlet where 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. The sampler should induce a small (e.g., pencil-sized) steady flow of water from the outlet or other sample location. The sampler should be careful not to begin with a high rate of flow, and then reduce the flow just prior to sampling. Sudden changes in flow could stir up sediments or cause sloughing of pipe films that would not be characteristic of typical water use patterns.

Eliminating Particulate Lead as a Source of Lead in Drinking Water

Alternative Step 2:

If initial first draw sampling results reveal concentrations higher than 20 ppb 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 a contributing source to elevated lead levels in your facility.

Determining aerator/screen debris contribution:

Scenario 1: Your initial first draw sampling result was higher than 20 ppb, you decide to see if the aerator is a contributing source of lead in the water. After cleaning out your aerator you take another first draw sample.* The results come back less than or close to 5 ppb or the detection level. This result tells you that the debris in the aerator was contributing to elevated levels in your school. Continue to clean out the aerator on a regular basis and this outlet is O.K. to use. However, please note that without regular maintenance this tap may serve water with elevated lead levels.

Scenario 2: Your initial first draw sampling result is 25 ppb, you decide to see if the aerator is a contributing source of lead in the water. After cleaning out your aerator you take another first draw sample.* The second sample result is very close or equivalent to the 25 ppb sample. Since your initial first draw sample and alternative second first draw sample results are similar, the problem is upstream from the aerator. Continue to follow the sampling protocol and do your follow-up flush sampling.

Scenario 3: Your initial first draw sampling result is 60 ppb, you decide to see if the aerator is a contributing source of lead in the water. After cleaning out your aerator you take another first draw sample.* The second sample result is 25 ppb. While your results are lower, but still above 20 ppb, this tells you that the aerator or screen is a contributing source and that the plumbing upstream of the aerator is contributing as well. If this situation occurs, you should continue with follow-up flush sampling to target the additional contributing sources.

** When taking your second first draw sample, please remember to follow the same sampling procedure as your initial first draw sample.*

A comparison of initial and follow-up samples will help to assess where the lead may be getting into the drinking water. See Exhibits 4.3 through 4.8 for follow-up flush sampling instructions for various types of outlets.

After follow-up flush sampling, additional samples from the interior plumbing within the building are also often necessary to further pinpoint the sources of lead contamination. See Exhibit 4.9 for instructions for additional sampling.

After reviewing the plumbing profile questionnaire and background regarding what your answers to the profile could mean (Exhibit 3.1), you have learned that lead contamination may not occur uniformly throughout a building. You should have an idea of the type of water you are receiving. From this assessment, you will then have a better sense of how to organize your testing activities. When planning your strategy, <u>it is important to note that large variations in lead concentrations may be found among individual outlets in a facility because of differences in flow rates and/or building materials.</u>

In general, you may find widespread presence of lead in your drinking water when:

- Lead pipes are used throughout the facility.
- The building's plumbing is less than 5 years old and lead solder was illegally used (i.e., after the "lead-free" requirements of the 1986 Safe Drinking Water Act Amendments took effect). This situation is rare.
- The water is corrosive.
- Sediment or scale in the plumbing and faucet screens contain lead.
- Brass fittings, faucets, and valves were installed throughout the building less than five years ago (even though they may contain less than the "lead-free" requirements of the Safe Drinking Water Act).
- The service connection (i.e., the pipe that carries water from the public water system main to the building) is made of lead.

In general, you may find localized presence of lead if:

- Some brass fittings, faucets, and valves have been installed in the last five years (even though they may meet the SDWA "lead-free" requirement).
- Drinking water outlets are in line with brass flush valves, such as drinking water fountains near restroom supply piping.
- Lead pipes are used in some locations.
- The water is non-corrosive.
- Lead solder joints were installed in short sections of pipe before 1986 or were illegally installed after 1988 (i.e., after the lead-free requirements of the Safe Drinking Water Act took effect).
- There are areas in the building's plumbing with low flow or infrequent use.
- Sediment in the plumbing and screens frequently contains lead.
- Some water coolers or other outlets have components that are not lead-free, especially if the water is corrosive.

After identifying potential problem areas in your facility through completion of a plumbing profile, the next step is to have the water tested. A sampling plan should be developed before testing begins. Key issues to consider in devising a sampling plan include the following:

- Who will be in charge of the sampling effort?
- Who will collect and analyze samples and maintain records?
- Where will the samples be taken?

4.4.3 Initial and Follow-Up Sampling Protocol

The protocol for collecting initial first draw and follow-up flush samples varies by type of drinking water outlet. The initial first draw and follow-up flush testing protocols and the interpretation of test results are described in Exhibits 4.3 thorough 4.9 for the following locations and type of outlets:

- **Service connections and water mains**
- **Drinking water fountains** *(four types)*
  - Bubblers or drinking water fountains (without central chillers): water is supplied to the bubbler or fountain directly from the building's plumbing.
  - Bubblers or drinking water fountains (with central chillers): a central chiller unit cools water for a number of drinking water fountains or bubblers in the building.
  - Water coolers: devices are equipped with their own cooling and storage systems; water is supplied to the device from the building's plumbing.
  - Bottled water dispensers: type of water fountain whose water is supplied from bottled water.

    Note: The Food and Drug Administration (FDA) regulates bottled water. EPA recommends testing the dispenser to ensure that the dispenser is not contributing lead to the water.
- **Ice making machines**
- **Water faucets**
- **Interior plumbing**

Please note that sampling ID codes have been indicated in the descriptions of the sampling protocol for each outlet type. These sampling ID codes have been included for illustrative purposes only. When you conduct testing in your facility, you should assign your unique numbers for every sample you collect.

Following the instructions for the above water outlet locations are instructions for conducting sampling of the interior plumbing of buildings (Exhibit 4.9). Instructions are included for sampling laterals, loops and headers, and riser pipes. These types of samples are necessary if outlet follow-up flush samples show lead levels above 20 ppb.

TIP: Schools may wish to collect both initial and follow-up samples at the same time. This is more convenient and may save time and money if a contractor has been hired to collect the samples. 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 after taking the initial sample could compromise the flushed samples taken at subsequent outlets, depending upon the plumbing configuration. As succeeding outlets are flushed, the chances of compromising the remaining flushed samples would increase.

Exhibit 4.2 provides an overview of the sampling process in a flow chart format.

As discussed in section 4.1, you may wish to modify sampling recommendations to suit your site conditions. For example, if you believe that flushing an outlet for 30 seconds prior to taking a follow-up flush sample is excessive, you may wish to calculate a more accurate time estimate. This could be done by:

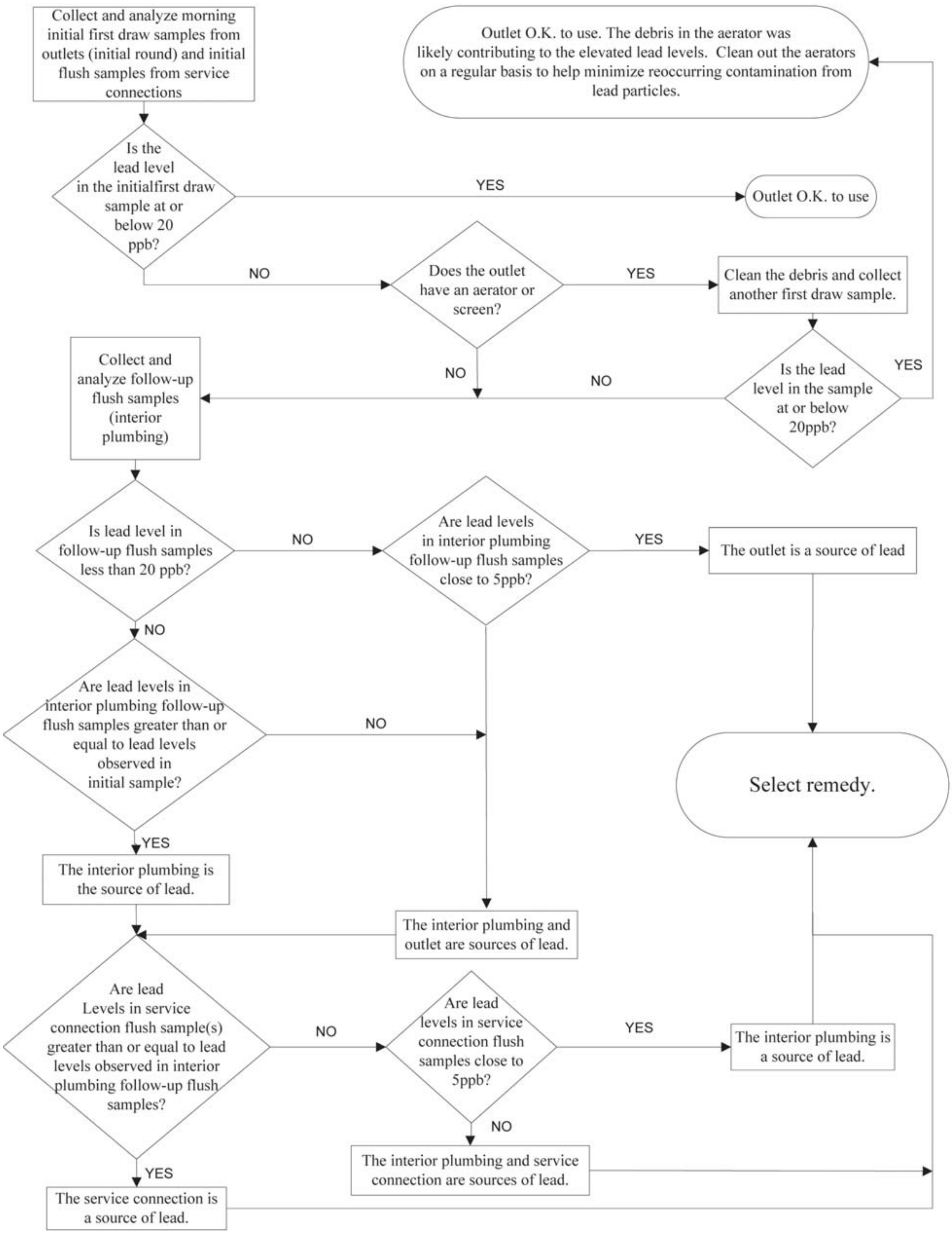
- Calculating the pipe volume in gallons between the outlet and the location in the plumbing that you want to sample.
- Measuring the outlet flow in gallons per minute.
- The length of time for flushing can be determined by dividing the pipe volume in gallons by the outlet flow in gallons per minute.

Pipe volumes per foot of pipe length for various pipe sizes are shown in Exhibit 4.1 below.

Exhibit 4.1: Pipe Volumes for Copper Pipe

Nominal Pipe Diameter (inches)	Approximate Capacity (gallons per foot of length)	
	Type K Copper (soft)	Type L Copper (rigid)
3/8	0.0066	0.0075
1/2	0.0113	0.0121
3/4	0.0226	0.0251
1	0.0404	0.0429
1 1/4	0.0632	0.0653
1 1/2	0.0895	0.0924
2	0.1566	0.1607
2 1/2	0.2412	0.2479
3	0.3448	0.3538

Exhibit 4.2: Sample Strategy Flowchart



4.4.4 Sampling for Other Parameters

In addition to monitoring for lead, you may wish to monitor for other parameters that may provide an indication of problems in your plumbing. However, note that analysis costs will increase as the number of parameters increases. Some other parameters are listed in the following table:

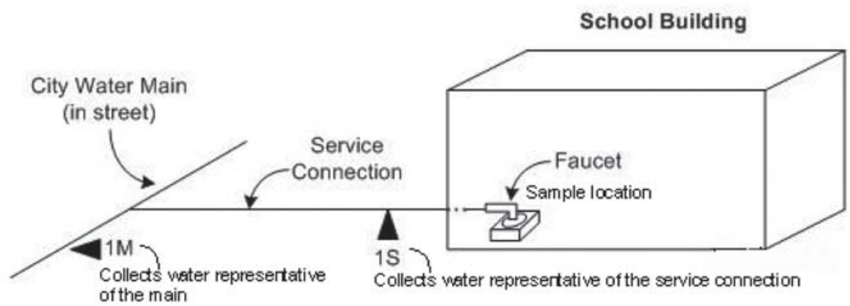
Contaminant	Limit	Concern
Cadmium	5 ppb	A regulated toxic metal found in low levels in galvanized pipe. The maximum allowable level is 5 ppb. However, the presence of cadmium at any level indicates that corrosive conditions may exist in the plumbing.
Color	15 color units	An aesthetic parameter that may indicate the presence of iron oxides. Iron oxides are often present in iron or steel pipe as a result of corrosive conditions.
Copper	1300 ppb	A regulated toxic metal used to make copper piping. The presence of copper in water samples taken from copper piping is not unusual, but higher levels indicate that corrosive conditions may be a concern.
Iron	300 ppb	An aesthetic parameter that is indicative of corrosive conditions at higher levels. See also color and turbidity. (Galvanized pipe is typically made of iron.)
Turbidity	1 turbidity unit	A measurement of the clarity of water. Higher turbidity values may indicate the presence of iron oxides. Iron oxides are often present in iron or steel pipe as a result of corrosive conditions.
Zinc	5000 ppb	An aesthetic parameter that is indicative of corrosive conditions at higher levels. Zinc is used in making galvanized piping products. The presence of zinc in water samples taken from galvanized piping is not unusual, but higher levels indicate that corrosive conditions may be a concern.

Exhibit 4.3: Service Connection Sampling

Lead pipes are still used for service connections in some locations. Other materials used for service connections include copper, galvanized steel, plastic, and iron. Lead service connections can produce significant lead levels in your drinking water.

To test water in your service connection, locate the tap closest to the service connection. This is especially important for larger facilities where more than one service connection is present.

Sample Collection Procedures:



Targeted Locations of Water in Plumbing
for Samples 1S & 1M

Sample 1S (Service Connection)
Take this sample before the facility opens. Note that this initial sample <u>is not a first-draw sample</u>. Open the cold water tap closest to the service connection. Let the water run, and feel the temperature of the water. Depending upon the temperature of your public water system's water and the temperature of the room, you may feel the water temperature change as the water from the service connection enters the building. However, it is possible that the water in the service connection and the building are close to the same temperature. Therefore, you should collect the sample immediately after a temperature change is detected, or after 30 seconds. Flushing removes the water that was in the facility's interior plumbing and allows sampling of the water that was in the service connection. You may wish to calculate a more accurate flush time for your building by using the method described in section 4.4.3.

Sample 1M (Water Main)
This sample is representative of the water that is provided by the distribution main. Take the sample from the same location as sample 1S. Let the water run, and feel the temperature of the water. If you can feel a change in water temperature, allow the water to run an additional 3 minutes after the temperature changes and then collect the sample. If you cannot feel a change in temperature, allow the water to run for 3 minutes and 30 seconds.

If possible, you should take this sample from a faucet rather than a drinking fountain because of the limited flow that is normally provided by a drinking fountain. Also, a change in temperature may be difficult to detect if the sample is taken from a water cooler (see the discussions for Samples 1S and 1M below).

Interpreting Test Results:

- If the lead level of Sample 1S (service connection) significantly exceeds 5 ppb (for example, 10 ppb) and is higher than in sample 1M, lead is contributed from the service connection. Check for the presence of a lead service connection by scratching it with a knife or key. (Lead test kits are available from water testing and laboratory supply companies and are relatively inexpensive.) Lead is soft and dull gray in appearance. When scratched, it will be shiny. In the absence of a lead service connection, lead goosenecks or other materials containing lead may be the source of the contamination.
- If the lead level of Sample 1M (water main) significantly exceeds 5 ppb (for example, 10 ppb), lead in the water may be attributed to the source water, sediments in the main, or to lead in the distribution system such as from lead joints used in the installation or repair of cast iron pipes.
- If the lead levels of Samples 1S and 1M are very low (close to 5 ppb), very little lead is being picked up from the service line or the distribution main. Usually, no significant amount of lead (above 5 ppb) comes from the public water system.

For example scenarios of different water sample results, please see Appendix H.

Exhibit 4.4: Drinking Water Fountains: Bubblers

Do not close the shut-off valves to the water fountains to prevent their use prior to sample collection. Minute amounts of scrapings from the valves will produce inaccurate results showing higher than actual lead levels in the water. Take all samples with the taps fully open.

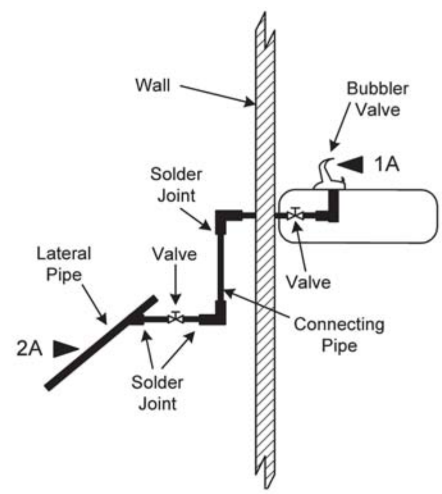
Sample Collection Procedures:

- **Initial First Draw Screening Sample 1A**
  This sample is representative of the water that may be consumed at the beginning of the day or after infrequent use. It consists of water that has been in contact with the bubbler valve and fittings and the section of plumbing closest to the outlet of the unit.

  Take this sample before the facility opens and before any water is used. Collect the water immediately after opening the valve without allowing any water to run into the drain. Take follow-up samples from those bubblers where test results indicate lead levels over 20 ppb.

- **Follow-Up Flush Sample 2A**
  This sample is representative of the water that is in the plumbing upstream from the bubbler (from the bubbler back toward the service connection and the water main). Take this sample before the facility opens and before any water is used. Let the water from the fountain run for 30 seconds before collecting the sample. If several bubblers are served by a central chiller, samples should be taken from different bubblers on different days.

One Style of Drinking Water Fountain



Targeted Locations of Water in Plumbing for Samples 1A & 2A

Note: All the samples are collected at the outlet. The sample numbers indicate what water is being targeted for testing.

Interpreting Test Results:

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


Fountains Connected to a Central Chiller

- If the lead level in Sample 1A is higher than that in Sample 2A, a portion of lead in the drinking water is contributed from the bubbler.
- If the lead level in Sample 2A is very low (close to 5 ppb), very little lead is picked up from the plumbing upstream from the outlet. The majority or all of the lead in the water is contributed from the bubbler.
- If the lead level in Sample 2A significantly exceeds 5 ppb (for example, 10 ppb), lead in the drinking water is also contributed from the plumbing upstream from the bubbler.
- If the lead level in Sample 2A exceeds 20 ppb, EPA recommends collecting follow-up flush samples from the header or loop supplying water to the lateral to locate the source of the contamination. *(Sampling instructions for interior plumbing can be found in Exhibit 4.9.)*

For example scenarios of water sample results and possible solutions, see Appendix H.

Exhibit 4.5: Drinking Water Fountains: Water Coolers

Do not close the valves to the water fountains to prevent their use prior to sample collection. Minute amounts of scrapings from the valves will produce inaccurate results showing higher than actual lead levels in the water. Take all samples with the taps fully open.

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

Wall-Mounted Cooler

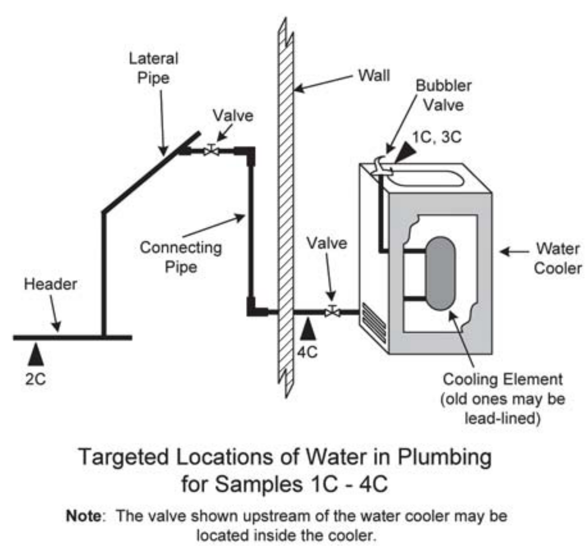
Prior to testing, check the make and model numbers of your water coolers and compare them to EPA's listing of coolers that have lead parts or lead-lined tanks *(see Appendix E for a summary of the water cooler issues and EPA's list of affected coolers).* If you have a Halsey Taylor cooler that is on EPA's list of coolers with lead-lined tanks, consult Halsey Taylor for information on their replacement/refund program and associated testing directions. Contact information is provided in Appendix E.

Regardless of whether your water cooler appears on EPA's listing, initial testing should be conducted.

- **Initial First Draw Screening Sample 1C**
  This sample is representative of the water that may be consumed at the beginning of the day or after infrequent use. (In areas of infrequent use, the water may not have been used in more than 18 hours. This is acceptable if this is representative of the normal water consumption pattern.) The sample consists of water that has been in contact with the interior plumbing, the valve and fittings, the storage unit, and the section of plumbing closest to the outlet of the unit.

  Take this sample before the facility opens and before any water is used. Collect the water immediately after opening the faucet without allowing water to waste. Take follow-up flush samples from water coolers whose test results indicate lead levels greater than 20 ppb.

  When conducting follow-up flush testing with water coolers you should be aware that some



water coolers manufactured before 1988 may have storage tanks lined with materials containing lead. You should contact the manufacturer of any water cooler units you have purchased or are planning to purchase for written guarantees that the unit is lead-free. *A list of makes and model numbers of coolers that contain lead has been prepared by EPA and is summarized in Appendix E.*

- **Follow-Up Flush Sample 2C**
  This water sample is representative of the water that is in contact with the header or rising piping upstream of the cooler. Take this sample after the facility closes. Let the water from the fountain run for 15 minutes before collecting the sample. You must flush the cooler for 15 minutes to ensure that no stagnant water is left in the storage unit.

- **Follow-Up First Draw Sample 3C**
  Take this sample before the facility opens and before any water is used. This sample must be taken the morning after you collect Follow-Up Flush Sample 2C. Collect the water immediately after opening the faucet without allowing any water to waste.

  Because the water in the cooler was flushed the previous afternoon, this sample is representative of the water that was in contact with the cooler overnight, not in extended contact with the plumbing upstream. As such, it may differ from Initial First Draw Screening Sample 1C.

Interpreting Test Results:

- IF | Follow-up Sample 3C | IS GREATER THAN | Follow-up Sample 2C | THEN

  → *The water cooler may be contributing lead.*

- IF | Follow-up Sample 3C | IS GREATER THAN | Follow-up Sample 2C | AND

  Initial Sample 1C | IS GREATER THAN | Follow-up Sample 3C | THEN

  → *The upstream plumbing may also be contributing lead.*

- IF | Follow-up Sample 2C | IS CLOSE OR EQUAL TO | Follow-up Sample 3C | THEN

  → *The water cooler is probably not contributing lead.*

- IF | Follow-up Sample 1C | IS GREATER THAN | Follow-up Sample 3C | AND

  Follow-up Sample 2C | IS CLOSE OR EQUAL TO | Follow-up Sample 3C | THEN

  → *The water cooler and/or upstream plumbing are probably contributing lead.*

- IF | Follow-up Sample 2C > 20 ppb, AND | IS GREATER THAN OR EQUAL TO | Initial Sample 1C & Follow-up Sample 3C | THEN

  → *The source of the lead may be sediments contained in the cooler storage tank, screens, or the plumbing upstream from the cooler.*

- **Follow-Up First Draw Sample 4C**
  To confirm whether the cooler is the source of lead, take Follow-Up First Draw Sample 4C.

  Turn off the valve leading to the cooler. Disconnect the cooler from the plumbing and look for a screen at the inlet. Remove the screen. If there is debris present, check for the presence of lead solder by sending a sample of the debris to the laboratory for analysis.

  Some coolers also have a screen installed at their outlet. Carefully remove the bubbler outlet by unscrewing it. Check for a screen and debris and have a sample of any debris analyzed.

  Some coolers are equipped with a drain valve at the bottom of the water reservoir. Water from the bottom of the water reservoir should be sampled and any debris analyzed.

  Collect Sample 4C from the disconnected plumbing outlet in the same manner as you collected Sample 1C. Compare the results from Sample 4C to the other sample results.

Interpreting Additional Water Cooler Test Results:

- IF $\boxed{\text{Follow-up Sample 4C}}$ IS LESS THAN 5 ppb, THEN → *The lead is coming from debris in the cooler or in the screen.*
- IF $\boxed{\text{Follow-up Sample 4C}}$ IS MUCH GREATER THAN 5 ppb, THEN → *The lead is coming from debris in the cooler or in the screen.*
- IF $\boxed{\text{Follow-up Sample 4C}}$ IS MUCH GREATER THAN 5 ppb, AND LESS THAN $\boxed{\text{Initial Sample 1C}}$ THEN → *The source of lead may be sediments contained in the cooler, screens, and/or the upstream plumbing.*

For example scenarios of water sample results and possible solutions, see Appendix H.

Exhibit 4.6: Drinking Water Fountains: Bottled Water Dispensers

Sample Collection Procedures:
This testing will identify if lead is being contributed to the water from the dispenser.

Notes: The Food and Drug Administration (FDA), regulates the interstate sale of bottled water and has established a 5 ppb standard for lead in bottled water. EPA recommends that you contact your distributor for written assurance that the bottled water does not exceed federal or state bottled water standards, and a copy of recent test results.

- **Initial First Draw Screening Sample 1D**
  This sample is representative of the water that may be consumed at the beginning of the day or after infrequent use. It consists of water that has been in contact with the dispenser valve and fittings incorporated in the outlet of the unit.

  Take this sample before the facility opens and before any water is used. Collect the water immediately after opening the faucet without allowing any water to waste. Take follow-up flush samples from those bottled water dispensers where test results indicate lead levels over 20 ppb.

- **Follow-Up Flush Sample 2D**
  Collect this sample directly from the bottle that supplies the water to the unit. This will enable you to determine the source of lead in the water. See the Note below for an alternative to follow-up sampling.

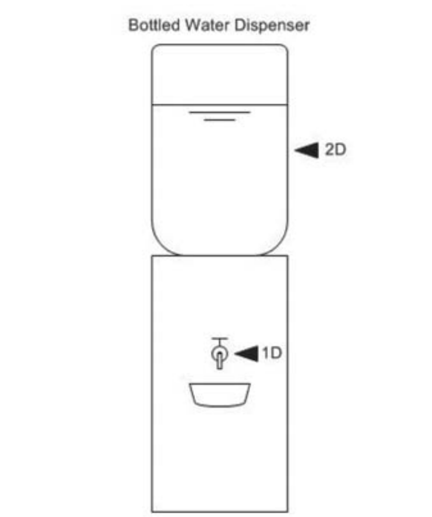
Bottled Water Dispenser

Interpreting Test Results:

- If the sample contains lead, contact the water supplier and/or the manufacturer of the dispenser to ask for their recommendations.
- If the lead level in Sample 1D is higher than that in Sample 2D, lead may be coming from the dispenser unit.
- If the lead level in Sample 2D is identical or close to that in Sample 1D, the source of lead is the bottled water.

Note: Many dispensers have a hot and cold tap. Water from both taps is meant to be directly consumed, therefore, both taps should be sampled. However, you may wish to sample the hot water tap on a separate day.

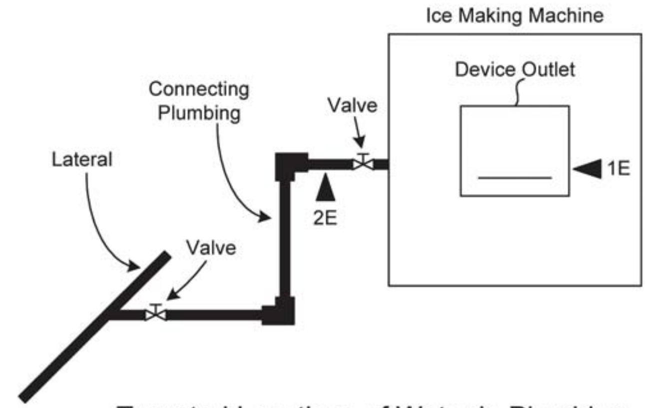
For example scenarios of water sample results and possible solutions, see Appendix H.



Targeted Locations of Water in Plumbing for Samples 1D & 2D

Exhibit 4.7: Ice Making Machines

Sample Collection Procedures:



Targeted Locations of Water in Plumbing for Samples 1E & 2E

- **Initial Screening Sample 1E**
  Fill a suitable container (250 mL or larger, wide-mouthed bottle or other container) provided by the laboratory at least three-quarters full of ice. Do not touch the ice with your hands. Use the non-metal scoop or disposable plastic gloves provided by the laboratory to place the ice in the container.

  If the lead level in Sample 1E exceeds 20 ppb, collect a follow-up sample to determine if the source of the lead is the plumbing or the ice making machine itself.

- **Follow-Up Sample 2E**
  Disconnect the ice maker from the plumbing and look for a screen at the inlet. Remove the screen. If debris is present, forward a sample of the debris to the laboratory for analysis and clean out the remaining debris. The laboratory will determine whether lead solder is present. Clean the screen routinely to avoid accumulations of debris.

  Collect the sample from the disconnected plumbing as close to the ice maker as possible. Fill the sample container with 250 mL of water. If no tap is available, contact the ice machine manufacturer for recommendations that will minimize disruption of existing plumbing. Adding taps or valves could add new sources of lead to the plumbing, even if the new devices are lead-free and meet NSF Standard 61, section 8. If a sample tap or valve is available, collect the sample immediately after opening the tap or valve.

Interpreting Test Results:

- If the lead level in Sample 2E is close to 5 ppb, the source of the lead in the ice is the ice maker.
- If the lead level in Sample 2E significantly exceeds 5 ppb (for example, 10 ppb), lead is also contributed from the plumbing upstream from the ice maker.
- If the lead level in Sample 2E exceeds 20 ppb, EPA recommends collecting follow-up flush samples from the distribution system supplying water to the ice maker. *Refer to Exhibit 4.9 on Sampling Interior Plumbing for instructions.*

For example scenarios of water sample results, please see Appendix H.

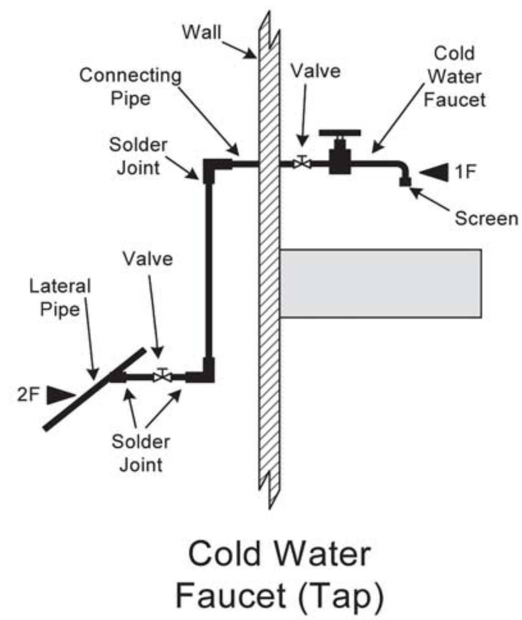
Exhibit 4.8: Water Faucets (Taps)

Sample Collection Procedures:

- **Initial First Draw Screening Sample 1F**
  This sample is representative of the water that may be consumed at the beginning of the day or after infrequent use. It consists of water that has been in contact with the fixture and the plumbing connecting the faucet to the lateral pipes.

  Take this sample before the facility opens and before any water is used. If your facility has a routine maintenance program for removing, cleaning, and replacing aerators you can perform this task prior to collecting the sample.

  Using the cold water tap, collect the water immediately after opening the faucet without allowing any water to go to waste. Follow-up flush samples should be taken from those water faucets where initial screening test results indicate lead levels over 20 ppb.



Targeted Locations of Water in Plumbing for Samples 1F & 2F.

- **Follow-Up Flush Sample 2F**
  This sample is representative of the water that is in the plumbing upstream from the faucet. Take this sample before school opens and before any water is used. Let the water from the faucet run for 30 seconds before collecting the sample.

Interpreting Test Results:

- If the lead level in Sample 1F is higher than that in Sample 2F, the source of lead is the water faucet and/or the plumbing upstream from the faucet.
- If the lead level in Sample 2F is very low, close to 5 ppb, very little lead is coming from the plumbing upstream from the faucet. The majority or all of the lead in the water is from the faucet and/or the plumbing connecting the faucet to the lateral.
- If the lead level in Sample 2F significantly exceeds 5 ppb (for example, 10 ppb), lead may be contributed from the plumbing upstream from the faucet.

For example scenarios of water sample results and possible solutions, see Appendix H.

Exhibit 4.9: Sampling Interior Plumbing

In general, if lead levels exceed 20 ppb in follow-up samples taken from drinking water outlets, additional samples from upstream sample sites in the interior plumbing should be collected. EPA recommends that water samples from each lateral, header and riser (where applicable) be collected because use patterns may vary among locations within a building. The configuration of interior plumbing will vary depending on the layout of a given building. Construction materials may also vary, especially in larger buildings where additions and repairs have been made to the original structure. *See Exhibits 4.10 and 4.11 for simplified diagrams of the interior plumbing in single-level and multi-level buildings.*

Sampling should proceed systematically upstream from follow-up sample sites that exceed 20 ppb. (*However, you do not have to sample at upstream sites where follow-up samples have already been taken.)* The goal of this sampling effort is to isolate those sections of the interior plumbing that contribute lead to the water. This is achieved by comparing the results of interior plumbing samples with each other, and with the results of previously collected follow-up samples.

Developing procedures from upstream sampling from laterals, headers and risers can be difficult because of the wide variation in plumbing configurations among facilities. As discussed in 4.4.3, the sampling procedures in this manual were developed for typical configurations that may not be similar to your facility. You may wish to either develop your own sampling procedures using the guidance provided in 4.4.3, or retain a consultant for guidance in this process.

Laterals
A lateral is a plumbing branch between a fixture or group of fixtures (e.g., taps, water fountains, etc.) and a header.

Sample Collection Procedures:

- **Sample 1G** (lateral)
  Open the outlet that has been designated as the sample site for the lateral pipe. Let the water run for 30 seconds before collecting the sample. Collect a 250 mL sample. The purpose of flushing the water is to clear the plumbing between the sample site and the lateral pipe. This action will ensure collection of a representative sample.

Note: Sample 1G corresponds to follow-up samples taken from other outlets such as 2A, 2E and 2F. Compare the results of these samples from outlets upstream and downstream of Sample 1G for additional information on the source of the lead within the interior plumbing. (As noted above, you do not have to take sample 1G at sites where follow-up samples have already been taken. The previous results are adequate.)

Interpreting Test Results:

- <u>IF</u> | Follow-up Sample 1G | IS GREATER THAN 20 ppb | <u>THEN</u>

  → *Collect additional samples from the plumbing upstream where samples have note been previously taken; i.e., from the header that feeds the lateral, the riser pipe (if applicable), or the service connection.*

  ***Note:** High lead levels may be caused by recent repairs or by sediment in the plumbing. Sediment should be sent to a laboratory for analysis.*

- <u>IF</u> | Follow-up Sample 1G | IS CLOSE OR EQUAL TO | Initial results from a downstream outlet | <u>THEN</u>

  → *The lead is contributed from the lateral and/or from interior plumbing upstream from the lateral. Possible sources include the lateral, header, riser pipe, or service connection.*

- <u>IF</u> | Follow-up Sample 1G | IS CLOSE OR EQUAL TO 5 ppb | <u>THEN</u>

  → *The portion of the lateral upstream from Sample Site 1G and the interior plumbing supplying water to the lateral are probably not contributing lead. The source is downstream from Sample Site 1G.*

- <u>IF</u> | Follow-up Sample 1G | IS APPROXIMATELY 10 ppb OR GREATER <u>AND</u> IS LESS THAN | Initial results from a downstream outlet | <u>THEN</u>

  → *A portion of the lead is contributed from the plumbing downstream from Sample Site 1G.*

Headers

A header is the main water supply pipe on a given floor of a building. A header supplies water to laterals. In smaller buildings, a header may be very short and/or have a relatively small diameter.

Sample Collection Procedures:

- **Sample 1H** (header)
  Locate the sampling point furthest from the service connection or riser pipe (see discussion of riser pipes on the next page) on the floor. You should try to take this sample from a faucet to provide adequate flushing through the tap. Open the faucet and let it run for 30 seconds before collecting this sample. Fill the sample container with 250 mL of water. The purpose of flushing the water is to clear the faucet and plumbing between the sample site and the header pipe.

Interpreting Test Results:

- IF [Follow-up Sample 1H] IS GREATER THAN 20 ppb THEN

→ *Collect additional samples from the plumbing upstream that supplies water to the header (if not already done); i.e., the riser pipe (if applicable), or the service connection.*

Note: *High lead levels may be caused by recent repairs or by sediment in the plumbing. Sediment should be sent to a laboratory for analysis.*

- IF [Follow-up Sample 1H] IS CLOSE OR EQUAL TO [Initial results from a downstream outlet] THEN

→ *The lead is contributed from the header and/or from interior plumbing upstream from the header. Possible sources include the header, riser pipe, or service connection.*

- IF [Follow-up Sample 1H] IS CLOSE OR EQUAL TO 5 ppb THEN

→ *The portion of the header upstream from Sample Site 1H and the interior plumbing supplying water to the header are probably not contributing lead. The source is downstream from Sample Site 1H.*

- IF [Follow-up Sample 1H] IS APPROXIMATELY 10 ppb OR GREATER AND IS LESS THAN [Initial results from a downstream outlet] THEN

→ *A portion of the lead is contributed from the plumbing downstream from Sample Site 1H.*

Riser Pipes

A riser is the vertical pipe that carries water from one floor to another.

Sample Collection Procedures:

- **Sample 1J**
  Open the tap closest to the riser pipe. Let the water run for 30 seconds before collecting the sample. Fill the sample container with 250 mL of water. The purpose of flushing is to clear the faucet and plumbing between the sample site and the riser pipe.

Interpreting Test Results:

- IF $\boxed{\text{Follow-up Sample 1J}}$ IS GREATER THAN 20 ppb, THEN

  → *Collect additional samples from the plumbing upstream that supplies water to the riser (if not already done); i.e., a riser from another floor, or the service connection.*

  Note: *High lead levels may be caused by recent repairs.*

- IF $\boxed{\text{Follow-up Sample 1J}}$ IS CLOSE OR EQUAL TO $\boxed{\text{Initial results from a downstream outlet}}$ THEN

  → *The lead is contributed from the riser and/or from interior plumbing upstream from the sample site. Possible sources include the riser pipes on other floors or the service connection.*

- IF $\boxed{\text{Follow-up Sample 1J}}$ IS CLOSE OR EQUAL TO 5 ppb THEN

  → *The portion of the riser upstream from Sample Site 1J and the service connection are probably not contributing lead. The source is downstream from Sample Site 1J.*

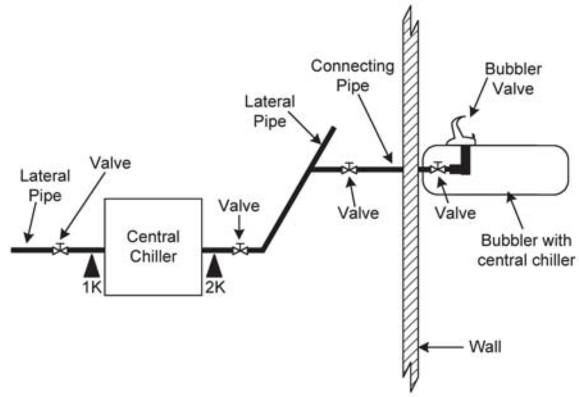
- IF $\boxed{\text{Follow-up Sample 1J}}$ IS APPROXIMATELY 10 ppb OR GREATER AND IS LESS THAN $\boxed{\text{Initial results from a downstream outlet}}$ THEN

  → *A portion of the lead is contributed from the plumbing downstream from Sample Site 1J.*

For example scenarios of water sample results and possible solutions, see Appendix H.

Sample Collection Procedures – Central Chiller Unit:

- **Follow-Up First Draw Sample 1K**
  This sample is representative of water that has been in contact with the plumbing supplying water to the chiller. Take this sample before the facility opens and before any water is used. Take the sample from a tap or valve as close to the inlet of the chiller as possible. If no tap is available, contact the chiller manufacturer for recommendations that will minimize disruption of existing plumbing. Adding taps or valves could add new sources of lead to the plumbing, even if the new devices are lead-free and meet NSF Standard 61. If a sample tap or valve is available, collect the sample immediately after opening the tap or valve, without allowing any water to waste.



Targeted Locations of Water in Plumbing for Samples 1K & 2K

- **Follow-Up First Draw Sample 2K**
  This water sample consists of water that has been in contact with the chiller unit and the plumbing upstream which supplies water to the chiller. Often, water supplied to the bubblers is recirculated to the chiller unit. In this instance, Sample 2K consists of a mixture of water from the water supply and any water that may be recirculated from the plumbing supplying water to the bubblers.

  Take the sample from a tap or valve as close to the outlet of the chiller as possible. If no tap is available, contact the chiller manufacturer for recommendations that will minimize disruption of existing plumbing. Adding taps or valves could add new sources of lead to the plumbing, even if the new devices are lead-free and meet NSF Standard 61. If a sample tap or valve is available, collect the sample immediately after opening the tap or valve.

Interpreting Test Results – Central Chiller Unit:

Note: You will need the results from samples collected at the bubblers per instructions in exhibit 4.4.

- If the lead level in Sample 2A is higher than that in Sample 2K, lead is contributed from the plumbing supplying the water from the chiller to the bubbler.
- If the lead level in Sample 2K is higher than in Sample 1K, a portion of the lead may be coming from the chiller. Note: Sludge and sediments containing high levels of lead may accumulate in chiller tanks. If the test results indicate that lead is contributed from the chiller unit, check for the presence of debris and sludge. Remove any of these materials from the chiller, flush the chiller unit, and resample the water.
- If the lead level in Sample 1K exceeds 20 ppb, EPA recommends additional sampling from the distribution system supplying water to the chiller to locate the source of contamination.
- If the lead level in Sample 1K is very low (close to 5 ppb), very little lead is picked up from the plumbing upstream from the chiller. The majority or all of the lead in the water may be attributed to the chiller and the plumbing downstream from the chiller.

For example scenarios of water sample results and possible solutions, see Appendix H.

Exhibit 4.10: Sample Sites for a Single-Level Building

1. Morning first-draw samples from coolers, faucets, bubblers, etc. (Initial Screening Samples 1A, 1C, 1D, 1E, 1F.)
2. Samples from lateral after 30-second flush from designated outlets. (Follow-up Samples 2A, 2E, 2F, 1G.)
3. Samples from coolers after 15-minute flush. (Follow-up Sample 2C.)
4. Samples from coolers morning first-draw. (Follow-up Sample 3C.)
5. Morning first-draw from coolers at disconnected plumbing outlet. (Follow-up Sample 4C.)
6. Sample from header pipe taken from faucet farthest from service line. (Sample 1H.)
7. Sample from service line and distribution main taken from faucet closest to service line. (Samples 1M, 1S.)

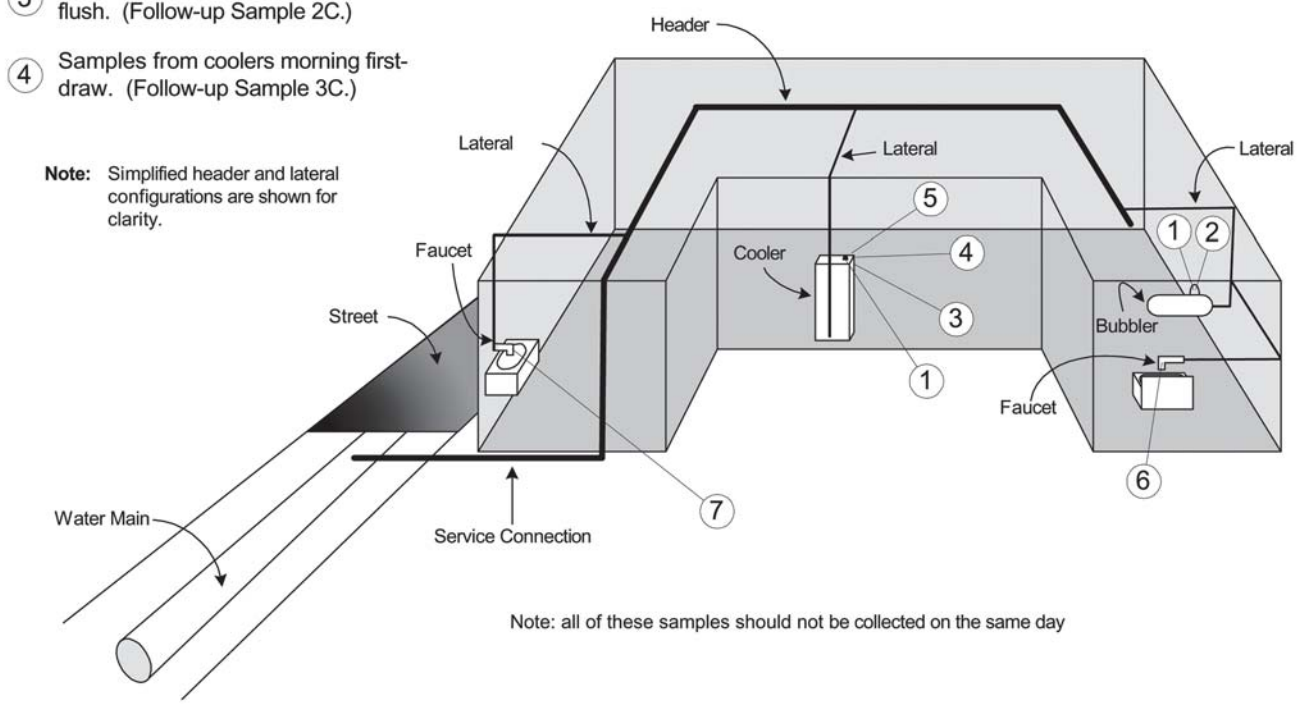
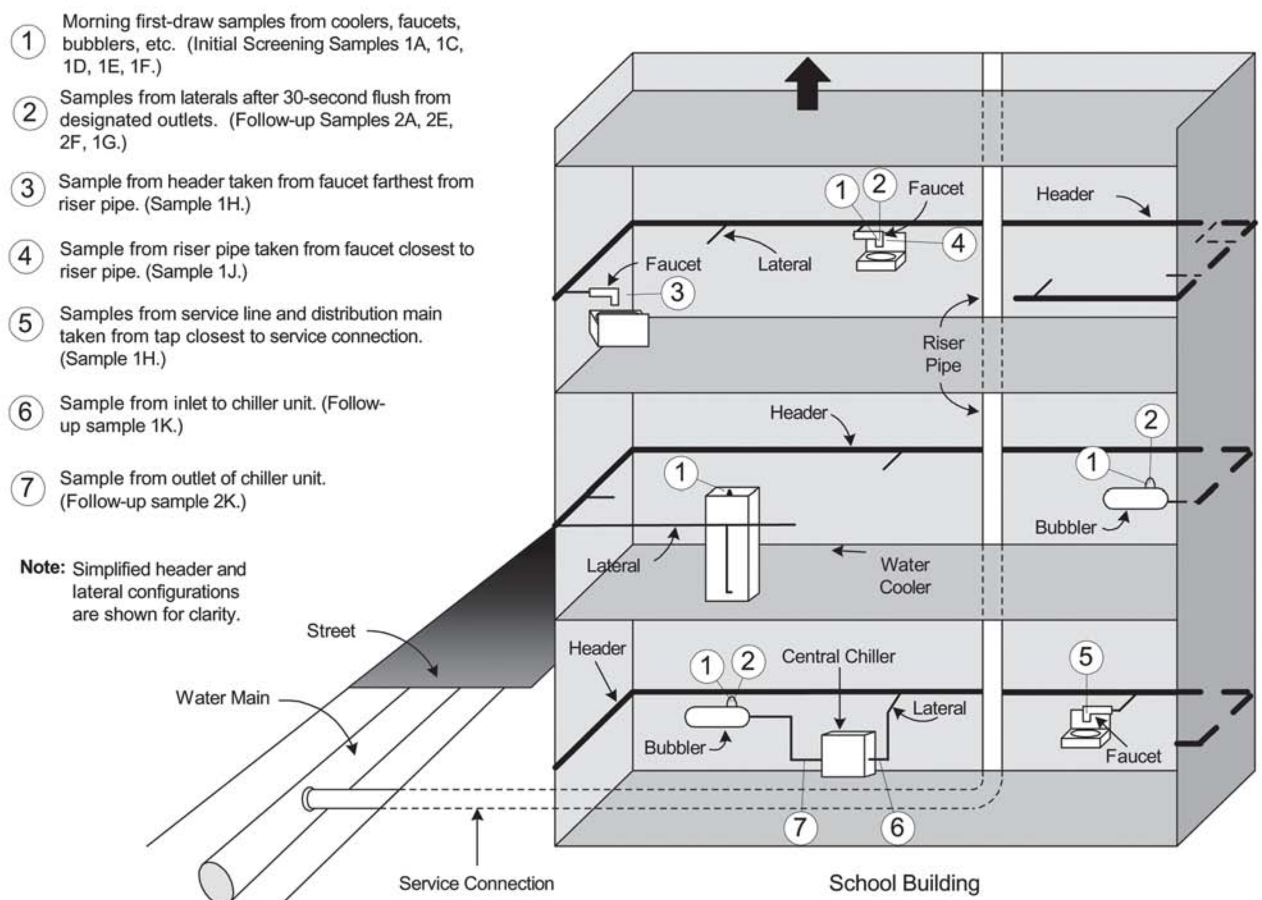


Exhibit 4.11: Sample Sites for a Multi-Level Building



Note: all of these samples should not be collected on the same day.

5. Remedies

Solutions to lead problems typically need to be made on an interim (short-term) and on a permanent basis. Interim measures can be taken while you wait for your test results or until a permanent solution has been put in place. In addition, there are routine measures that should be taken. You should work closely with maintenance staff and any plumbers who may make repairs. Make sure that users are familiar with the use of new fixtures you install.

Outlined below are various routine, interim and permanent remedies. To aid you in the process of selecting remedies, a case study has been included as Exhibit 5.3.

5.1 Routine Control Measures

Below are examples of routine activities that should be conducted to prevent exposure to elevated levels of lead:

- Create aerator (screen) cleaning maintenance schedule and clean debris from all accessible aerators frequently.
- Use only cold water for food and beverage preparation. Hot water will dissolve lead more quickly than cold water and is likely to contain increased lead levels. If hot water is needed, it should be taken from the cold water tap and heated on a stove or in a microwave oven.
- Instruct the users (students and staff) to run the water before drinking or staff could run the water before students arrive, so they are drinking water that has not been in contact with the faucet interior since faucets are often a major source of lead in drinking water.
- Placard bathroom sinks with notices that water should not be consumed. You should use pictures if there are small children using bathrooms.

5.2 Interim (Short-Term) Control Measures

Some examples of interim control measures include:

(1) **"Flush" the piping system in your building.** "Flushing" involves opening suspect taps every morning before the facility opens and letting the water run to remove water that has been standing in the interior pipes and/or the outlets. The flushing time varies by the type of outlet being cleared. The degree to which flushing helps reduce lead levels can also vary depending upon the age and condition of the plumbing and the corrosiveness of the water. Flushing instructions are presented in Exhibit 5.1.

Exhibit 5.1: Flushing Directions by Outlet Type

Remember that each drinking water outlet should be flushed individually; flushing a toilet will not flush your water fountains. All flushing should be recorded in a log submitted daily to the office, or person, in charge of this program.

- Locate the faucet furthest away from the service line on each wing and floor of the building, open the faucets wide, and let the water run for 10 minutes. For best results, calculate the volume of the plumbing and the flow rate at the tap and adjust the flushing time accordingly. This 10-minute time frame is considered adequate for most buildings.
- Open valves at all drinking water fountains without refrigeration units and let the water run for roughly 30 seconds to one minute, or until cold.
- Let the water run on all refrigerated water fountains for 15 minutes. Because of the long time period required, routinely flushing refrigerated fountains may not be feasible. It may therefore be necessary, and more economical, to replace these outlets with lead-free, NSF-approved devices.
- Open all kitchen faucets (and other faucets where water will be used for drinking and/or cooking) and let the water run for 30 seconds to one minute, or until cold.

Advantages:

- Quickest and easiest solution to high lead levels, especially when contamination is localized in a small area or in a small building.
- Does not require installation or maintenance of water treatment equipment.
- Does not require complex instructions.

Disadvantages:

- The most obvious disadvantage to flushing is the potential waste of water involved in the flushing procedures. To minimize this disadvantage, consider the following:
    - Flush pipes only after weekends or vacations when lead levels may be highest (use only if lead levels do not exceed 20 ppb on a daily basis).
    - Thoroughly flush several designated drinking water outlets daily while taking all others temporarily out of service.
    - Use bottled water.
    - Collect water being flushed and use for non-consumptive purposes.
- Another obvious disadvantage to flushing is the amount of time and staff needed to perform the task.
- Flushing is not recommended as a practical remedy for water coolers.

HINT: Be careful not to flush too many taps at once. This could dislodge sediments that might create further lead problems, or it could reduce pressure in the system below safe levels. If the flow from outlets is reduced noticeably during flushing, you have probably turned on too many taps at once.

(2) **Provide bottled water.** This can be an expensive alternative but might be warranted if you expect or are aware of widespread contamination and flushing is not an option. If you use bottled water, be aware that it is not regulated by EPA but rather by the Food and Drug Administration (FDA). Your state may also regulate bottled water, and, in some instances, these standards may be more stringent than the federal requirements. EPA recommends that you require a written statement from the bottled water distributor guaranteeing that the bottled water meets FDA and state standards.

(3) **Shut off problem outlets.** If initial sample results from an outlet exceed 20 ppb, the outlet can be shut off or disconnected until the problem is resolved. If the outlet had been frequently used, bottled water could be provided as a temporary replacement as suggested in item 2 above.

5.3 Permanent Remedies

You can take a number of actions to permanently reduce or eliminate the sources of lead that originate in your building's plumbing. Some of these actions may allow the elimination or reduction of routine flushing or other interim measures. After obtaining an understanding of your water supply and the lead conditions in your facility (as a result of testing), you should examine the permanent treatment options and select those most appropriate to your situation. Obviously, your decision will be based on such factors as cost, likelihood of success, availability of water, and staffing requirements.

(1) **Replacement**. If the sources of lead contamination are localized and limited to a few outlets, replacing these outlets or upstream components may be the most practical solution. EPA worked with the plumbing industry and NSF International to develop an industry standard that is designed to minimize the amounts of lead being leached from these products. This standard is NSF Standard 61 (Sections 4, 8 and 9). Before you purchase any brass plumbing products, request information regarding compliance with this standard.

> Tip: If multiple components (for example, bubbler valves) are in need of replacement, you may wish to purchase only one or two initially. You could then take follow-up water samples after installing the new component(s) to see if that particular product leaches unacceptable levels of lead. If follow-up testing is satisfactory, you could be reasonably certain that the product will perform well at other locations in your facility.

NSF Standard 61, Section 4 covers pipes, fittings and small drinking water storage devices having domestic or residential applications, including the products or water contact materials of pipes, fittings, tubing, hoses, well casing, drop pipes and screens, etc.

NSF Standard 61, Section 8 covers inline mechanical devices that are used to measure or control the flow of water. Inline devices used to measure or control the flow of water in a building include water meters, building valves, check valves, meter stops, valves and fittings, backflow preventers, etc. An inline device is any device installed on a service line or building distribution system downstream of the water main and before endpoint devices.

NSF Standard 61, Section 9 covers endpoint devices. The devices include kitchen and bar faucets, lavatory faucets, water dispensers, drinking fountains, water coolers, glass fillers, residential refrigerator ice makers, supply stops, and endpoint control valves. *Under the Lead Ban, these devices must meet the requirements of this standard.* Be sure to check for compliance with NSF Standard 61, Section 9 before purchasing or installing an endpoint device.

(2) **Lead levels can be reduced at the tap.** Reverse osmosis units are commercially available and can be effective in removing lead. Since these devices also tend to make the water corrosive, they should only be used when placed at water outlets. Such devices are termed point-of-use (POU) devices. POU devices can be used to treat faucets or taps, but would not be used on drinking water fountains. There are a number of POU cartridge filter units on the market that effectively remove lead.

POU devices can be either purchased or leased. They can be relatively inexpensive ($65 to $250) or expensive (ranging from $250 to $500), their effectiveness varies, and they may be vulnerable to vandalism. They also require a maintenance program for regular upkeep to ensure effectiveness. Cartridge filter units need to be replaced periodically to remain effective. NSF International, an independent, third-party certification organization, has a testing program to evaluate the performance of POU devices for lead removal (NSF Standard 53). Before purchasing any device, ask the manufacturer for proof of NSF approval and the Performance Data Sheet, or check by visiting the NSF Web site at http://www.nsf.org/business/search_listings/index/asp.

(3) **Check grounding wires**. Electrical current may accelerate the corrosion of lead in piping materials. Existing wires already grounded to the water pipes can possibly be removed by a qualified electrician, and replaced by an alternative grounding system. If your local or state building codes allow, consider finding an alternative grounding system and have a qualified electrician make the change. Be aware that the removal of grounding from water pipes may create a shock hazard unless an acceptable, alternative ground is provided.

(4) **Lead pipe replacement**. Lead pipes within the school and those portions of the lead service lines under the water supplier's jurisdiction can be replaced. Contact your public water supplier regarding their jurisdiction. However, your facility may be responsible for replacing a portion of a lead sevice line that is under its own administrative jurisdiction, rather than under the jurisdiction of the water supplier.

(5) **Reconfigure plumbing**. In some facilities, the plumbing system might be modified so that water supplied for drinking or cooking is redirected to bypass sources of lead contamination. Before undertaking such an alternative, be certain of the sources of lead contamination. Follow-up testing would also be necessary, as with the other remedies, to ensure that the efforts result in reduced lead levels at the tap.

(6) **Manual flushing**. Flushing individual problem outlets or all outlets may also represent a permanent, albeit ongoing, solution. There are advantages and disadvantages to flushing. Flushing is often the quickest and easiest solution to high lead levels, especially when contamination is localized in a small area or in a small building. *See the Interim Remedies section above for a discussion of the advantages/disadvantages of this remedy in addition to outlet flushing instructions. You should review this information before deciding whether flushing is appropriate as a permanent remedy in your facility.*

(7) **Automatic flushing.** Time-operated solenoid valves can be installed and set to automatically flush the main pipes (headers) of the system. It is important to note that solenoid valves are not practical for flushing water coolers. They would have to be flushed manually by staff. *See the Interim Remedies section above for flushing instructions for water fountains.*

(8) **Bottled water**. If other treatment fails or is impractical, bottled water can be purchased for consumption by the building community. As noted under the interim remedies section above, make sure that the bottled water you select meets federal and/or state standards for lead and other drinking

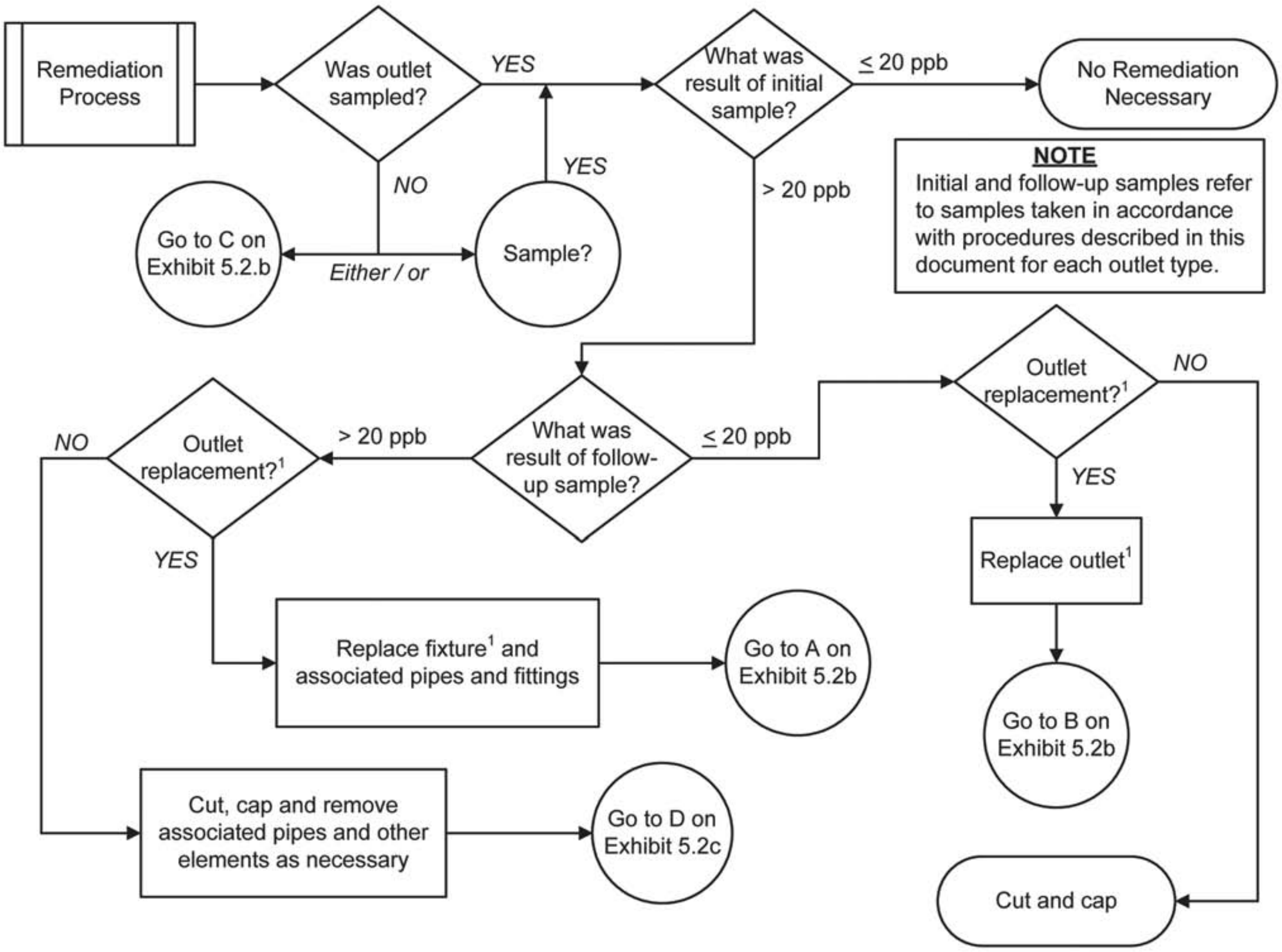
water contaminants. EPA recommends that you require a written statement from the bottled water distributor guaranteeing that the lead levels in the water do not exceed 5 ppb.

(9) **Use lead-free materials**. Make sure that any plumber who does repair or replacement work on the facility's plumbing system uses only "lead-free" solders and other materials. The 1986 Safe Drinking Water Act Amendments require that only "lead-free" materials be used in new plumbing and plumbing repairs. Make sure all plumbers and other workers adhere to these requirements. These actions will ensure that new lead is not introduced into the facility's plumbing system. Report any violations of the "lead-free" requirements to your local plumbing inspector, the state drinking water program or EPA *(see Appendix D for a directory of state programs).*

(10) **Shut off problem outlets.** If initial sample results from an outlet exceed 20 ppb, the outlet can be shut off or disconnected permanently. If the outlet had not been used regularly, this may be a viable option. However, if the outlet had been frequently used, this is probably not a practical solution.

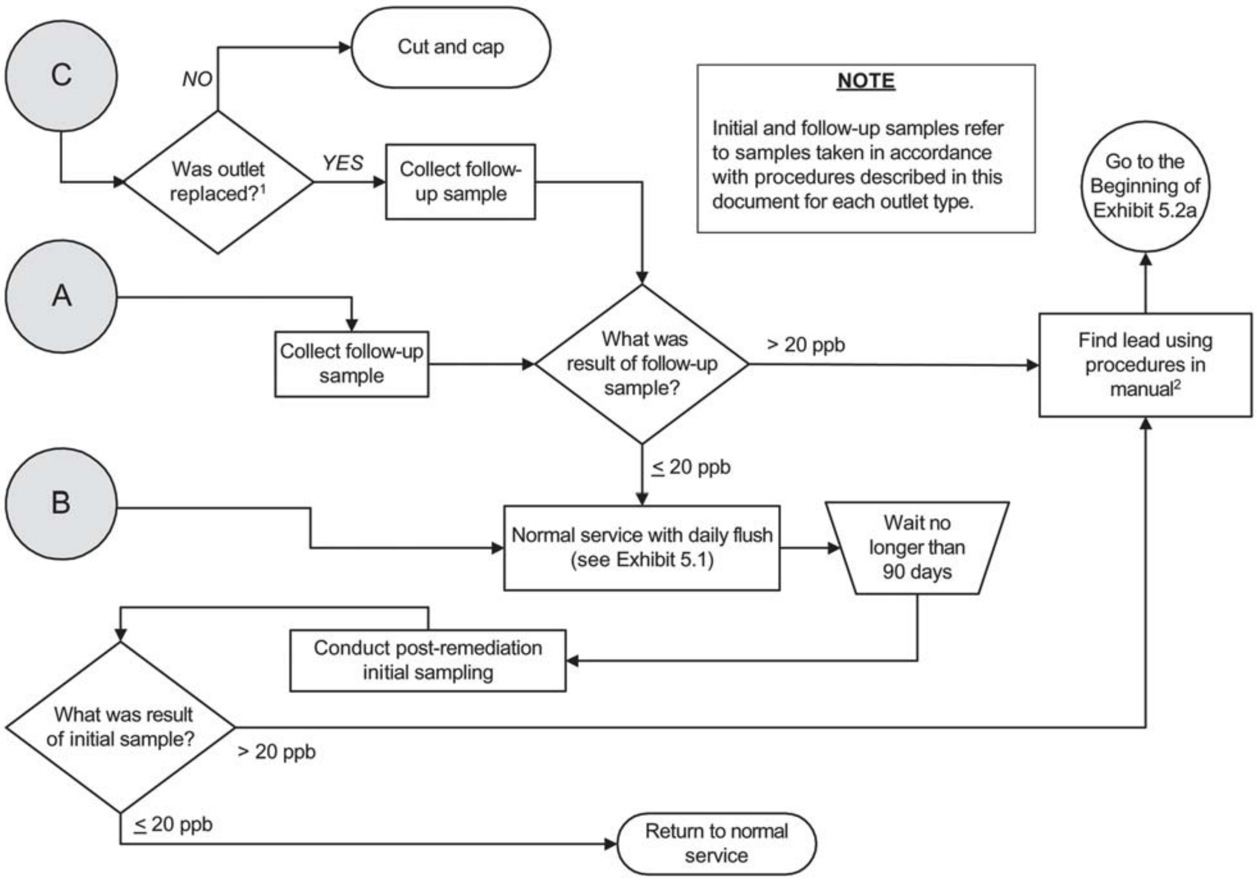
Three flow charts (Exhibits 5.2a through 5.2c) illustrating a basic remediation process are presented below. Please note that these flow charts provide a basic process for developing permanent solutions to lead problems. Interim measures are therefore not specifically addressed on the charts. Also, for simplicity, not all of the possible permanent remedies listed in the above discussion are shown on the charts. However, these options provide additional flexibility and should be considered when using the flow charts. For example, a school might decide to provide a point-of-use reverse osmosis treatment unit at a kitchen sink tap in lieu of replacing high lead plumbing because a treatment unit would provide better overall water quality for cooking *and* it would remove lead from the water.

Exhibit 5.2a: Remediation Flow Chart (part 1)



1 Point-of-use treatment devices or routine flushing measures may serve as alternatives to outlet replacement (see Section 5.3). Continue on with the flow chart.

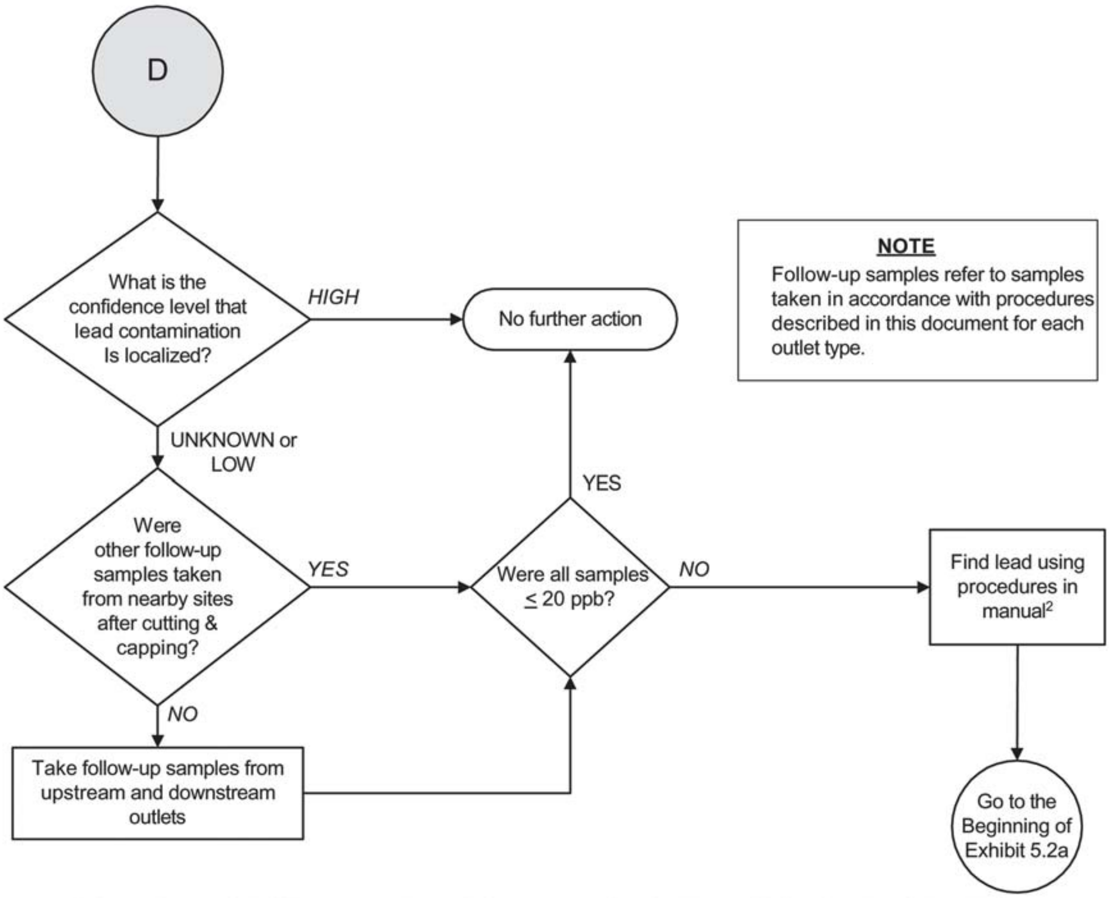
Exhibit 5.2b: Remediation Flow Chart (part 2)



1 Point-of-use treatment devices or routine flushing measures may serve as alternatives to outlet replacement (see Section 5.3). Continue on with the flow chart.

2 Procedures include follow-up sampling and development of a plumbing profile (see Sections 3.1 and 4.4).

Exhibit 5.2c: Remediation Flow Chart (part 3)



2 Procedures include follow-up sampling and development of a plumbing profile (see Sections 3.1 and 4.4).

Exhibit 5.3: Case Study 1

This case study illustrates how one large school district addressed a long-standing lead problem. A variety of solutions were used to address lead problems at 50 schools in the district.

Background

Schools were sampled in 1991 and 1992 in response to the Lead Contamination Control Act. Drinking fountains with lead levels over 20 ppb were replaced. However, subsequent testing showed that levels at some outlets continued to be above 20 ppb. Internal recommendations to replace plumbing at four schools were not implemented due to many complex factors. A flushing program was implemented, but was not consistently applied.

In 2003, a concerned parent conducted testing at one school because of iron staining problems. The testing showed that there were also lead problems at the school. Recognizing that the problem was likely widespread, the district put all schools over 7 years old on bottled water and sent a letter of notification to every parent.

A consultant was hired to create a comprehensive testing program for almost 100 schools. A working group consisting of the school's local public water supplier, the county and state health departments, and toxicologists was formed to develop a comprehensive approach.

A comprehensive water quality policy was adopted that includes standards for lead and 5 other contaminants. The standard for lead (10 ppb) is more stringent than EPA's recommended Action Level for schools and public buildings. The policy includes procedures for short-term and long-term testing, and for remediation.

Testing

In cooperation with the working group, the district's consultant developed plumbing profiles and a testing program, and the district began comprehensive lead testing in 2004 at 2400 sample locations. All drinking water fountains and cold water taps in classrooms, nurse's offices, and kitchens were sampled. Other locations were sampled if they were deemed to be a potential health risk because of possible human consumption. Lead levels over 20 ppb were found at 25% of the locations. One location was 1600 ppb. Fifty schools were found to have at least one outlet with a problem. The water supplied by the local public water system was found to have typically less than 1 ppb lead and was ruled out as a source of lead.

Testing also showed that flushing of the outlets for 30 seconds reduced the lead levels to below 20 ppb at all but 3% of the locations. Additionally, cadmium was found at 3% of the sample locations, and coliform-positive samples were found at 6 schools.

Remediation

The district adopted a policy for mitigation that included a target level of 10 ppb for lead. Additionally, the EPA public water supply standards for cadmium, copper, iron and coliform bacteria were adopted. (The EPA standard for iron is a secondary standard, which means that the standard is primarily an aesthetic standard rather than health-based. Under federal law, public water supplies are not required to comply with secondary standards.) Compliance with the district's adopted standards will be maintained through fixture replacement, filtration, replacement/rehabilitation of lines, or disabling of outlets.

Fountains and other outlets that produce lead analysis results higher than 10 ppb will be fixed or disabled. Fixtures with confirmed levels of iron over 0.5 ppm will be fixed or removed from service. If more than one-half of the drinking water sources in a school or in a wing of a school exceed 0.3 ppm iron, further remediation for iron will be addressed by the district.

The plumbing in the four schools originally targeted for replacement was fixed in the Summer of 2004. Eventually, the plumbing in all schools will be replaced or rehabilitated so the adopted water quality standards can be maintained. The approach used will range from complete piping replacement in just a few schools (no more than 7 total, including the 4 already done), to partial piping replacement in a number of schools (perhaps 15 total), to fixture replacement in many schools.

Bottled water is provided at all schools or locations within a school which have lead problems until problems are addressed. Drinking water is easily available to all students and all staff throughout the school day. After compliance with the adopted water quality standards is achieved, periodic testing will continue every three years until it is demonstrated that less frequent testing is necessary.

Public Education

The district understands the importance of informing parents, students, and staff of water quality policy and testing results.

Additionally, the district adopted the following steps:

- Qualified experts were retained to obtain the best advice.
- A public oversight committee was created to ensure awareness and involvement of the public.
- Community meetings are held as necessary to keep the public updated.
- School board briefing sessions related to lead are open to the public.
- A comprehensive Web site has been developed that includes health effects information, FAQs, contact information, and testing results for each school in the district.

Lessons Learned

The district had attempted to address the Lead Contamination Control Act in 1991 and 1992 through testing, replacement of drinking water fountains and flushing. Fountains that tested over 20 ppb were replaced until subsequent testing revealed that problems with lead persisted. Flushing efforts that were initially instituted were not uniformly implemented at all district schools. The district considered replacing plumbing in four schools, but no action was taken until 2004. The reasons for the work not being done are complex and no one reason can be cited. Additionally, there were no clear legal mandates for lead testing and compliance at schools served by public water utilities. Lead problems therefore continued at the schools without school officials' awareness.

Because remedial measures were not instituted as originally planned, the public was not aware that lead problems existed until 2003. The public response to the problems was very strong and clear. The public wanted to be aware of the problems and wanted them fixed. The school district had also lost credibility because of the amount of time, the inactivity, and the lack of communication since problems were initially discovered in the early 1990s.

The district has learned that clear, open, and timely communication is mandatory in order to restore public confidence. An aggressive policy of testing, remediation and disclosure has helped to bridge the gap between the district and the public and to restore confidence.

III. Telling

6. Informing the Public about Lead

In addition to testing for lead and solving any contamination problems, a lead control program should also include a public information component. This section discusses public information techniques and the importance of developing an overall communication strategy. Helpful communication hints are provided along with sample public notice materials.

6.1 Techniques for Disseminating Public Information

EPA recommends that schools conducting a lead-in-drinking-water sampling program comply with the public information components of the Lead Contamination Control Act. There are two components:

(1) Notify relevant parent, teacher, student, and employee organizations of the availability of your sampling program results.

(2) Make copies of the sampling results available in your administrative offices "for inspection by the public, including teachers, other school personnel, and parents."

Given the health effects of lead, EPA advocates that any school conducting sampling for lead make public any test results. In addition, such schools should identify activities they are pursuing to correct any lead problems found.

There are six basic public notification methods that can be applied alone or in combination to communicate lead-in-drinking-water issues and the meaning of your sampling program results.

You should choose the method(s) that best suits your particular situation and/or protocol. Remember, you should not provide sampling program results to the public without also providing a basis for interpreting and understanding the significance of those results. All materials should be culturally and linguistically appropriate.

- **Press Release:** A press release in the local newspaper can potentially inform a broad range of the public of lead in drinking water issues and the results of your sampling program. It is important that the release inform readers of how to obtain the sampling results and other lead in drinking water information and perhaps even include the phone number of an informed and available facility official.
- **Letters/Fliers:** Letters or fliers represent the most direct and effective method of communicating lead in drinking water activities to parents/guardians and other members of your school or building community. The letters and fliers should be mailed directly.
- **Mailbox or Paycheck Stuffers:** Mailbox and paycheck stuffers represent the most direct and effective method of communicating lead in drinking water activities to school employees. Stuffers would contain much the same information as that contained in a press release or letter/flier.
- **Staff Newsletter:** A notice contained in a staff newsletter is another option for directly and effectively communicating information about the lead program to employees.

- **Presentations:** Providing presentations at facility-related meetings is another effective means of communication. Relevant events for schools include meetings of parent-teacher organizations, faculty, and the school board.

- **Email and Web sites:** Electronic communications are convenient for many parents, especially those who work during the school day. Web sites can be updated frequently to quickly convey new information. Email provides a quick, easy method for parents to ask questions, but responses must be timely to be effective.

6.2 The Components of an Effective General Communication Strategy

Lead in drinking water can be an emotional and sensitive issue, especially for parents who are concerned about their children's health. As a result, you should not view communication and outreach activities as stand-alone or final efforts, but rather as a part of an *overall or general* communication strategy.

The purpose of a general communication strategy is to provide the means for addressing questions from members of your facility's community and also to provide ongoing, up-to-date information regarding your sampling efforts. *Ideally, you should designate a single spokesperson or special task force to interact with the public since it is important that your message remain consistent.*

The issues to be addressed as part of a communication strategy include:

- Participants
- Timing for delivery
- Content of the message
- Methods and manner of communication.

6.3 Participants

Overall, there are six primary players or interests involved in the control of lead in drinking water:

(1) **Your School Community:** School employees, students, and parents should be informed and involved from the beginning of the process. Interested employees, students, and parent volunteers can help address the issue and ensure safe drinking water at your school.

(2) **Building Community:** The building community consists of those users of the facility who would be most affected by lead in drinking water problems (i.e., students, teachers and other employees, school boards and community groups who use the facility). Members of the school and building community should be the primary targets of any general communication activities.

(3) **Local Health Community**: Local health officials, such as health officers, sanitarians, and nurses, can help you understand potential health risks associated with elevated lead levels in drinking water.

(4) **Larger Community:** The local and regional media can serve as a conduit for information reaching a larger local community. It is important that you be prepared to generate accurate news releases. Also, your spokesperson or task force should be prepared to respond to interview requests with accurate and consistent information.

(5) **States and EPA Regions:** State drinking water programs and EPA Regional offices are responsible for ensuring that public water suppliers comply with the state and federal regulations regarding lead in drinking water. States or EPA may be able to provide guidance or technical assistance in communication strategies, health risks, and other sources of lead.

(6) **Drinking Water Community:** Public water suppliers comprise the regulated drinking water community, and they are responsible for complying with all national and state drinking water standards for lead. This means that they must ensure that the water they deliver is non-corrosive, contains minimal amounts of lead, and will not result in significant lead-leaching from plumbing in individual homes and buildings.

6.4 Timing

The timing of your communication activities is very important. Whenever public health risks are involved, public communication efforts are less complicated and generate less conflict if those potentially affected are notified in advance of important issues and events. At a minimum, EPA recommends that you provide information to members of the local school community and the larger community (if deemed necessary) at the following three times.

(1) Before your lead in drinking water sampling program begins.

(2) In response to periodic interest.

(3) After you obtain the results of testing, when/if you decide upon corrective measures, or if no corrective measure are required because the lead levels are low.

6.5 Content

Your communication messages should consist of the following information:

(1) Details about the nature of your drinking water lead control program.

(2) The results of your sampling program and your plans for correcting any identified problems.

(3) Information on the public health effects and risks posed by lead in drinking water and the significance of lead in drinking water versus other sources such as food, air, dust, and soil.

(4) The availability of general lead in drinking water information resources and the availability of the detailed sampling results for your facility.

(5) How and where individuals may seek blood-lead level testing if they are concerned.

(6) Recommend consultation with a physician if further assistance is needed.

(7) How families can increase their awareness of exposure in their home and elsewhere.

6.6 Methods and Manner of Communication

The communication methods that can be used for your general communication strategy are largely the same as those described earlier and, thus, need not differ from communication activities common to school operations (i.e., meeting presentations, press releases, mailbox/paycheck stuffers, and letters to staff and parents). If your school has a large community of non-English speakers you should provide information in other languages, as appropriate, or provide a contact name for non-English speakers to get more information.

Additional methods unique to your lead control program may include:

(1) Creating an information center located at a convenient place in the facility such as a library or break room.

(2) Creating a task force with representatives from the community.

(3) Making available a list of laboratories that are state-certified to test home water for lead and other contaminants.

(4) (For schools) encouraging classroom science activities that focus on drinking water quality. *(Contact EPA's Safe Drinking Water Hotline 1-800-426-4791– see Appendix B and C – for information on organizations that have such science activities).*

The following list contains some hints for effective communication:

(1) Take the initiative in providing information to your community (it is important to do so before the media does it for you). When public health risks are involved, especially with respect to children, vague or incorrect information can be worse than no information at all.

(2) Be a good and reliable source of information. That is, provide honest, accurate, and comprehensive information in every necessary area.

(3) Always speak with one voice (i.e., designate points of contact – preferably one person – to respond to parents and the media).

(4) Anticipate likely questions from members of the local community, including civic organizations and the media, and prepare answers. Each member of the community may have a different concern or viewpoint on the subject of lead testing.

(5) Be positive, proactive, and forthcoming when working with the media. If you work together in a cordial manner, your communication efforts are likely to be less complex.

(6) Keep members of the building community up-to-date as important events and information on your lead testing program unfold.

6.7 Sample Public Notice Materials

Exhibit 6.1 contains a sample public notification letter that could be used and adapted to communicate lead testing information. Exhibit 6.2 is a sample press release for local media that could also be used or adapted. Exhibit 6.3 is a sample article that could be published in a school newsletter.

Exhibit 6.1: Sample Public Notice Letter

(Date)

Anytown School Department
Anytown, USA 00000-0000

Dear Anytown School Community:

Our school system is committed to protecting student, teacher, and staff health. To protect our community, (Anytown School District) tests our schools' drinking water for lead.

Why Test School Drinking Water for Lead?
High levels of lead in drinking water can cause health problems. Lead is most dangerous for pregnant women, infants, and children under 6 years old. Exposure to high levels of lead during pregnancy contributes to low birth weight and developmental delays in infants. In young children, lead exposure can lower IQ levels, affect hearing, reduce attention span, and hurt school performance. At *very* high levels, lead can even cause brain damage.

To protect public health, the U.S. Environmental Protection Agency (EPA) suggests that schools and day care facilities test their drinking water for lead. If lead is found at any water outlet at levels above 20 parts per billion (ppb), EPA recommends taking action to reduce the lead.

Is Our School's Drinking Water Safe?
Yes, our schools' water is safe. Anytown School District tested our drinking water for lead. Of the (number) water samples we tested, only (number) showed lead levels above the 20 ppb mark. In other words, (percentage) of the water outlets tested did not have any lead problems.

The first outlet with high lead levels was a drinking water fountain/bubbler at (Anytown High School). We identified the source of the lead so we could fix the problem. The faucet for this drinking water fountain/bubbler was made of lead parts. (Lead was often used in plumbing materials until it was banned in 1986). We replaced the part with a lead-free faucet. Then we tested the water again and found the problem was fixed.

The second outlet with high lead levels was a faucet in the kitchen of (Anytown Elementary School). We found the source of the lead was a pipe that brings water to the faucet. We replaced the pipe with lead-free pipe. Then we tested the water again and found the problem was fixed.

While we sampled the schools' water, we provided bottled water for all students and staff. When we found high lead levels at (two) water outlets, we made sure no one used those outlets until we had fixed the lead problems.

How Can I Learn More?
You can see a copy of all of our water testing results at the school district's central office, which is open Monday to Friday from (9:00 am to 5:00 pm) and on our Web site at (www.anytownschools.k12.us). For more information about water quality in our schools, please contact (John Doe) at (Anytown School District, 555-2233). For information about water quality and sampling for lead at home, contact your local water supplier or state drinking water agency.

Sincerely,

(Fred Frank)
Superintendent of Schools

Note: If your school district cannot immediately fix elevated lead levels, we encourage you to send this notice without delay. In that case, describe the interim measures you will take to provide safe drinking water until the problem can be addressed and the reason for the delay in a implementing a permanent solution.

Exhibit 6.2: Sample Press Release for Local Media

Anytown School Department
One School Street
Anytown, USA 00000-0000
Contact: Fred Frank, Superintendent

FOR IMMEDIATE RELEASE

News Release

Lead Levels in School Drinking Water Meet Federal Guidelines

Anytown, USA, April xx, 2005... The Anytown School Department announced today that recent tests of drinking water in the town's schools indicate that lead levels meet federal guidelines. Although lead was initially detected above the recommended level at one drinking water outlet in an elementary school and at one outlet in a senior high school, lead levels were reduced to acceptable levels following replacement of these outlets.

In making the announcement, School Superintendent Fred Frank stated, "We are pleased that the testing program identified only two drinking water outlets with elevated lead levels. Both outlets have since been replaced."

The School Department conducted the testing program to make sure that drinking water in the school system is safe for children and school staff. Water with high lead levels can contribute to negative health effects, especially in young children.

The testing was conducted in January by school personnel following federal and state guidelines. Samples from various locations in each of the schools were sent to a state-certified laboratory for analysis. The laboratory results were received by the School Department last week.

Information about the lead testing program, including the laboratory results, can be found at the School Department office at the above address, weekdays between 8:30 a.m. and 4:30 p.m.

STOP

Exhibit 6.3: Sample Newsletter Article

Anytown School District Conducts Sampling for Lead in Drinking Water

Why was Testing Conducted?

Schools that receive water from a public water system, such as our district, are not required by state or federal regulations to conduct testing for lead in their drinking water. The Environmental Protection Agency (EPA) requires our public water system to provide water to our school that is minimally corrosive. However, some school districts in other locations have found that water samples from their drinking water fixtures have contained relatively high levels of lead. The lead was found to come from the plumbing inside the schools, including fittings, solder, water coolers or water faucets. Because of this information, the Anytown School District decided that testing would be in the best interests of the children, parents, faculty and other citizens served by our district.

Health Effects of Lead

The EPA has determined that lead in drinking water is a health concern at certain levels of exposure. Lead is found throughout the environment in lead-based paint, air, soil, household dust, food, certain types of pottery porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that will not hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination - like dirt and dust - that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

How Lead Enters our Water

Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like groundwater, rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and in building plumbing. These materials include lead-based solder used to join copper pipe, brass, and chrome-plated brass faucets. In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials. However, even the lead in plumbing materials meeting these new requirements is subject to corrosion. When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into the drinking water. This means the first water drawn from the tap in the morning *may* contain fairly high levels of lead.

Lead in Drinking Water

Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of children under the age of 6. EPA estimates that drinking water can make up 20% or more of a person's total exposure to lead.

Results of our Testing

Following instructions given in an EPA guidance document especially designed for schools, we completed a plumbing profile for each of the buildings within the Anytown School District. Through this effort, we identified and tested those drinking water outlets most likely to have high levels of lead. Of the _____ samples taken, all but _____ tested well below EPA's recommended level of 20 ppb for lead.

The first outlet that tested high for lead was a drinking water fountain (bubbler) at Kennedy High School. After follow-up testing was conducted, it was determined that the faucet (bubbler head) was the source of the lead contamination. The faucet was replaced with a lead-free faucet and retested. Follow-up test results revealed lead levels well below EPA's recommended level.
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The second outlet, in the Lincoln Elementary School, was a faucet in the kitchen that showed unacceptable lead levels in both initial and follow-up testing. We found the source of the lead contamination to be the pipe providing water to the faucet. This pipe was replaced with lead-free materials.

During the testing period, bottled water was provided to all students at all schools to minimize the potential for lead exposure. Upon receiving the test results, the two outlets that tested high for lead were disconnected until they were replaced.

A copy of the test results is available in our central office for inspection by the public, including students, teachers, other school personnel, and parents, and can be viewed between the hours of 8:30 a.m. and 4:00 p.m. For more information about water quality in our schools, contact John Doe at the Anytown School Department, 555-2223. For information about water quality in your home or for questions about testing, contact your water supplier or drinking water agency.

Appendix A – Glossary of Terms

Bubbler: An outlet fixture that consists of the bubbler valve, the bubbler receptacle and all associated piping, valves and mounting appurtenances for attaching the fixture to a wall or mounting surface. A bubbler does not contain a refrigeration unit. Some bubblers are attached to central chiller units, while others are not.

Bubbler Valve: The valve and discharge device that mounts on top of the bubbler fixture and discharges water for consumption.

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

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

Drinking Water Fountain: A fixture connected to the water supply that provides water as needed. There are four types of drinking water fountains: (1) bubblers without central chillers, (2) bubblers with central chillers, (3) water coolers, and (4) bottled water dispensers.

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

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

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

Header: The main pipe in the internal plumbing system of a building. The header supplies water to lateral pipes.

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

Lead-free: Taken from Section 1417(d) of the Safe Drinking Water Act, this term means that solders and flux may not contain more than 0.2 percent lead; pipes, pipe fittings, and well pumps may not contain more than 8.0 percent lead; and outlet plumbing fittings and fixtures must meet standards established under the lead leaching requirements of section 1417(e) of the Safe Drinking Water Act.

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

Passivation: A corrosion control technique that causes the pipe materials to create metal-hydroxide-carbonate compounds that form a film on the pipe wall to protect the pipe.

Potable Water Pipes: The pipes in a distribution system and in a building which carry water intended for human consumption.

Public Water System: Any water system that has 15 or more service connections and is in operation at least 60 days per year or any water system serving 25 or more persons daily at least 60 days per year.

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

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

Service Connection: The pipe that carries tap water from the public water main to a building. In the past, these were often comprised of lead materials.

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

Solder: A metallic compound used to seal the joints between pipes. Until 1988, solder containing up to 50% lead was legally used in potable water plumbing. Lead-free solders, which can contain up to 0.2% lead, often contain one or more of the following metals: antimony, tin, copper or silver. Several alloys are available that melt and flow in a manner similar to lead solder.

Valves: Valves are any of numerous mechanical devices by which the flow of water may be started, stopped, or regulated by a movable part that opens, shuts, or partially obstructs one or more ports of passageway.

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

Appendix B – Publication List

Web Site Publications*

(1) ******Actions You Can Take To Reduce Lead in Drinking Water.*** Web site publication. US EPA 810-F-93-001. June 1993. http://www.epa.gov/safewater/lead/leadfactsheet.html

(2) ***Commonly Asked Questions: Section 1417 of the Safe Drinking Water Act and the NSF Standard.*** US EPA. http://www.epa.gov/safewater/standard/plumbing.html

(3) ***Consumer Fact Sheet on: Lead.*** Web site article. US EPA. http://www.epa.gov/safewater/dwh/c-ioc/lead.html

(4) ***Decision Tree for Pre-Sampling*** (at Schools). Web site article. US EPA. http://www.epa.gov/safewater/schools

(5) ****Fact Sheet - Lead Reduction Plan - EPA Activities to Improve Implementation of the Lead and Copper Rule.*** Web site publication. US EPA 810-F-05-001. March 2005. http://www.epa.gov/safewater/lcrmr/reductionplan_fs.html

(6) ***Frequently Asked Questions.*** Web site article. National Sanitation Foundation (NSF). http://www.nsf.org/business/water_distribution/dwa_usepa.asp

(7) ****Is There Lead in the Drinking Water?*** Web site publication. US EPA 903-F-01-002. April 2002. http://www.epa.gov/safewater/lead/pdfs/v2final.pdf

(8) ****Lead Contamination Control Act*** (pamphlet). Web site article. Web site publication. US EPA 570/9-89-AAA. July 1989. http://www.epa.gov/safewater/lead/pdfs/epalccapamphlet1989.pdf

(9) ***Lead Contamination Control Act*** (statute). Web site article. Government Printing Office. January 2004. http://www.access.gpo.gov/uscode/title42/chapter6a_subchapterxii_partf_.html

(10) ****Lead in Drinking Water in Schools and Non-Residential Buildings.*** Web site publication. US EPA 812-B-94-002. (April 1994 version of this document.)

(11) ***Lead in Schools and Day Care Centers.*** Web site article. US EPA.) http://www.epa.gov/safewater/lead/schoolanddccs.htm

(12) ***Mechanical Plumbing System Components.*** Web site article. Listing of approved components. NSF. http://www.nsf.org/business/mechanical_plumbing/index.asp?program=MechanicalPluSysCom

(13) ***National Lead Information Center - Document Request Site.*** US EPA. http://www.epa.gov/lead/nlicdocs.htm

(14) ***Post-Remediation Sampling.*** Web site article.(after replacement of fixtures, pipe, fittings, etc.). US EPA. http://www.epa.gov/safewater/lead/passivation.htm

(15) ***Testing Schools and Day Care Centers for Lead in Drinking Water.*** Web site article. US EPA. http://www.epa.gov/safewater/lead/testing.htm

(16) ****Lead Contamination Control Act*** (P.L. 100-572 - federal statute) and supporting documents. House Document Room, House of Representatives. Washington, DC 20515. (202) 225-3456.

(17) ****Sampling for Lead in Drinking Water in Nursery Schools and Day Care Facilities*** (booklet). US EPA 812-B-94-003. April 1994.

(18) ****The Lead Ban: Preventing the Use of Lead in Public Water Systems and Plumbing Used for Drinking Water*** (pamphlet on the federal lead ban). US EPA 570/9-89-BBB. August 1989.

* Also available in hard copy through the National Drinking Water Hotline. See below.

Hard Copy Publications

EPA National Safe Drinking Water Hotline
(800) 426-4791

Hotline operates Monday through Friday,
except federal holidays.

Appendix C – Resources

Safe Drinking Water Hotline 1-800-426-4791

Healthy School Environments

Healthy School Environments

This web site is designed to provide one-stop access to the many programs and resources available to help prevent and resolve environmental issues in schools. http://www.epa.gov/schools/

Department of Education Safe and Drug Free Schools

This Department of Education web site offers a collection of links and resources on various school health and safety topics. http://www.ed.gov/admins/lead/safety/edpicks.jhtml?src=qc

Lead Poisoning Prevention

Lead Poison Prevention

EPA's Lead Awareness Program designs outreach activities and educational materials, awards grants, and manages a toll-free hotline to help parents, home owners, and lead professionals learn what they can do to protect their families, and themselves, from the dangers of lead. http://www.epa.gov/lead/

The Centers for Disease Control Childhood Lead Poisoning Prevention Program

The Lead Contamination Control Act of 1988 authorized the Centers for Disease Control and Prevention (CDC) to initiate program efforts to eliminate childhood lead poisoning in the United States. Visit this web site for information on partnerships, publications, and various other materials addressing lead poison prevention. http://www.cdc.gov/nceh/lead/lead.htm

National Lead Information Center (NLIC)

The National Lead Information Center (NLIC) provides the general public and professionals with information about lead hazards and their prevention. NLIC operates under a contract with the U.S. Environmental Protection Agency (EPA), with funding from EPA, the Centers for Disease Control and Prevention, and the Department of Housing and Urban Development. (1-800-424-LEAD [5323]). http://www.epa.gov/lead/nlic.htm

Accredited Certification Programs:

American National Standards Institute: list of accredited plumbing and other product certification programs. www.ansi.org/public/ca/ansi_cp.html

The current companies/organizations with NSF 61 plumbing component certification programs accredited by ANSI:

> **National Sanitation Foundation:** Also provides information on the standards that it has issued. www.nsf.org
>
> **Underwriters Laboratories.** www.ul.com
>
> **International Association of Plumbing & Mechanical Officials, Research & Testing, Inc.** www.iapmo.org/rnt/index.html
>
> **Canadian Standards Association International.** www.csa.ca
>
> **Truesdail Laboratories.** www.truesdail.com

Appendix D – List of State Drinking Water Programs

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American Samoa

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Arizona

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Arkansas

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Appendix E – Water Cooler Summary

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

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

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

Based on responses to a Congressional survey in the winter of 1988, three major manufacturers, the Halsey Taylor Company, EBCO Manufacturing Corporation, and Sunroc Corporation, indicated that lead solder had been used in at least some models of their drinking water coolers. On April 10, 1988, EPA proposed in the *Federal Register* (at 54 *FR* 14320) lists of drinking water coolers with lead-lined tanks and coolers that are not lead-free. Public comments were received on the notice, and the list was revised and published on January 18, 1990 (Part III, 55 *FR* 1772). *See Table E-2 for a list of water coolers and lead components.*

Prior to publication of the January 1990 list, EPA determined that Halsey Taylor was the only manufacturer of water coolers with lead-lined tanks.[1] Table E-1 presents a listing of model numbers of the Halsey Taylor drinking water coolers with lead-lined tanks that had been identified by EPA as of January 18, 1990.

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

Since the LCCA required the CPSC to order manufacturers of coolers with lead-lined tanks to repair, replace or recall and provide a refund of such coolers, the CPSC negotiated such an agreement with Halsey Taylor through a consent order published on June 1, 1990 (at 55 *FR* 22387). The consent agreement calls on Halsey Taylor to provide a replacement or refund program that addresses all the water coolers listed in Table E-2 as well as "all tank-type models of drinking water coolers manufactured by Halsey Taylor, whether or not those models are included on the present or on a future EPA list." Under the consent order, Halsey Taylor agreed to notify the public of the replacement and refund program for all tank type models.

SPECIAL NOTE:
Experience indicates that newly installed brass plumbing components containing 8 percent or less lead, as allowed by the SDWA, can contribute high lead levels to drinking water for a considerable period after installation. U.S. water cooler manufacturers have notified EPA that since September 1993, the components of water coolers that come in contact with drinking water have been made with non-lead alloy materials. These materials include stainless steel for fittings and water control devices, brass made of 60 percent copper and 40 percent zinc, terillium copper, and food grade plastic.

Currently, a company formerly associated with Halsey Taylor, Scotsman Ice Systems, has assumed responsibility for replacement of lead-line coolers previously marketed by Halsey Taylor. See below for the address of Scotsman Ice Systems.

Scotsman Ice Systems
775 Corporate Woods Parkway
Vernon Hills, IL 60061
PH: (800) SCOTSMAN or 800-726-8762
PH: (847) 215-4500

Table E-1
Halsey Taylor Water Coolers With Lead-Lined Tanks[2]

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

WM8A	WT8A	GC10ACR	GC10A	GC5A	RWM13A

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

WM14A Serial No. 843034	WM14A Serial No. 843006	WT11A Serial No. 222650
WT21A Serial No. 64309550	WT21A Serial No. 64309542	LL14A Serial No. 64346908

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

Table E-2
Water Coolers With Other Lead Components

EBCO Manufacturing

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

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

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

Halsey Taylor

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

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

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

HC8WT	HC14F	HC6W	HWC7D	HC8WTH	HC14F H	HC8W	HC2F	HC14WT
HC14FL	HC14W	HC2FH	HC14WTH	HC8FL	HC4F	HC5F	HC14WL	HCBF7D
HC4FH	HC10F	HC16WT	HCBF7HO	HC8F	HC8FH	HC4W	HWC7	

If you have one of the Halsey Taylor water coolers noted in Table E-2, contact Scotsman Ice Systems *(address and phone noted above)* to learn more about the requirements surrounding their replacement and rebate program.

Appendix F – Sample Recordkeeping Form

Appendix F – Sample Recordkeeping Form

Record of Sampling

Name of Building	
Name of Sample Collector	
Contact Person for this Record	

				Sample ID Number

Circle sample type: Initial / 1st Follow-up / 2nd Follow-up

Length of Flush (for flushed samples)	
Type of Outlet (faucet, cooler etc.)	
Mfg/Model	
Serial #	
Date of Installation	
Location	
Date of Collection	
Time of Collection	
Name of Laboratory Used	
Lead Concentration (ppb)	

NOTES:

Appendix G - Preservation of Samples and Sample Containers

This appendix contains information pertaining to the preservation of samples and sample containers. A certified drinking water laboratory should be aware of these requirements. In addition, they will provide you with actual samplers or sample containers and instructions. The sample containers may have been prepared prior to your receipt. The laboratory will also specify how to handle the sample containers and when to submit them after taking your samples.

In order to avoid analytical errors, pay particular attention to proper collection and handling of the sample before analysis. Sample containers (250 mL) should be obtained from a certified laboratory. You should not use other containers such as used jars or water bottles.

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

For more detailed information, refer to the following documents:

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

Manual for the Certification of Laboratories Analyzing Drinking Water. US EPA 815-B-97-001. March 1997 (available from the National Technical Information Service (703) 487-4650).

Standard Methods for the Examination of Water and Wastewater, 20th Edition. Co-published by the American Public Health Association, the Water Environment Federation, and the American Water Works Association. 1998 (available from the American Water Works Association, ISBN # 0-87553-235-7, Catalog #10079).

Appendix H – Example Scenarios for Water Sample Results

Service Connection Sampling (See Exhibit 4.3)

Examples:

- Sample 1S (20 ppb) exceeds Sample 1M (5 ppb) = 15 ppb of lead is contributed from the service connection; the lead amount in the main (Sample 1M) does not exceed 5 ppb; therefore, you may want to check for a lead sevice line or gooseneck depending upon results of lead testing at other outlets in the building; if you reduce lead at the connection, lead levels may be reduced throughout the remainder of the building.
- Sample 1M is 10 ppb and Sample 1S is 10 ppb = very little lead is contributed from the service line; source of lead is most likely the water main.
- Sample 1S (7 ppb) and Sample 1M (6 ppb) are close to 5 ppb = very little lead (1 ppb) is being picked up in the water from the service line or the distribution main; very little lead is contributed from the source water; if other outlets show significantly higher lead levels, the source of the contamination is the interior plumbing and/or the outlets themselves.

Drinking Water Fountain without Central Chiller (See Exhibit 4.4)

Example:

- Sample 1A (31 ppb) exceeds Sample 2A (7 ppb) = 24 ppb of lead is contributed from the bubbler.
- Sample 2A (7 ppb) does not significantly exceed 5 ppb = very little lead (2 ppb) is being picked up from the plumbing upstream from the bubbler; the majority of the lead in the water is contributed from the bubbler.
- Sample 2A (7 ppb) does not exceed 20 ppb = sampling from header or loop supplying water to the lateral is not necessary.

Possible Solution: Replace fixture, valves, or fittings on bubbler with lead-free device (ensure compliance with the NSF standards for any fixtures you intend to purchase); retest water for lead after new materials installed.

Drinking Water Fountain with Central Chiller (See Exhibits 4.4 and 4.9)

Example 1:

- Sample 1A (25 ppb) exceeds Sample 2A (3 ppb) = 22 ppb of lead is contributed from the bubbler.
- Sample 2A (3 ppb) is close to 5 ppb = very little lead is being picked up from the plumbing upstream from the bubbler; the majority or all of the lead is contributed from the bubbler.

Possible Solution: Replace bubbler valve, fittings and/or fixture with lead-free materials (request results of lead leaching studies from manufacturers of brass products before purchasing to ensure that harmful amounts of lead will not be leached); retest water once new materials installed.

Example 2:

- Sample 1A (38 ppb) exceeds Sample 2A (21 ppb) = 17 ppb of lead is contributed from the bubbler.
- Sample 2A (21 ppb) significantly exceeds 5 ppb = about 21 ppb of lead is being contributed from the plumbing upstream from the bubbler.
- Sample 2A (21 ppb) exceeds 20 ppb = sampling from the chiller unit supplying the water to the lateral is necessary to locate the source of the contamination *(see instructions and examples below for sampling chiller units).*

Example 3:

- Sample 2A (21 ppb) exceeds Sample 2K (10 ppb) = 11 ppb of lead is contributed from the plumbing supplying the water from the chiller to the bubbler.
- Sample 2K (10 ppb) exceeds Sample 1K (4 ppb) = a portion of the lead (6 ppb) may be coming from the chiller; check for and remove any debris and sludge in the chiller unit; flush the unit, and resample the water.
- Sample 1K (4 ppb) does not exceed 20 ppb = additional sampling from the distribution system supplying water to the chiller is not necessary.
- Sample 1K (4 ppb) is very close to 5 ppb = very little lead is picked up from the plumbing upstream from the chiller; the majority or all of the lead in the water can be attributed to the chiller and the plumbing downstream from the chiller.

Possible Solutions: Flush the chiller unit and plumbing; if lead levels are still high, replace plumbing supplying water from the chiller to the bubbler; replace the bubbler fixture, fittings, and valves with lead-free materials; and clean sediment and debris from chiller unit. Retest water for lead once changes have been made. If the lead levels after initial flushing are low, clean any sediment and debris from the chiller, and resample the chiller monthly for 3 months. If the lead levels increase, the additional remediation measures listed immediately above are probably necessary to reduce lead risks. If the levels remain low, routine annual cleaning of sediment and debris and routine monitoring at the same frequency as other sites is recommended .

Example 4:

- Sample 2A (45 ppb) exceeds Sample 2K (28 ppb) = 17 ppb of lead is being contributed from the plumbing supplying water from the chiller to the bubbler.
- Sample 2K (28 ppb) exceeds Sample 1K (21 ppb) = 7 ppb of lead is contributed by the chiller.
- Sample 1K (21 ppb) exceeds 20 ppb = additional sampling from the distribution system supplying water to the chiller is necessary to locate the source of the contamination *(see Exhibit 4.9 on Sampling Interior Plumbing for instructions).*

Possible Solution: Lead levels are clearly elevated at all sample sites. It appears that multiple sources of lead are contributing to the problem. Retesting may help locate sources of lead, but it appears that the solution includes replacement of upstream plumbing; the bubbler fixture, valves, and fittings with lead-free materials; and cleaning the sediment and debris from the chiller. Retest water for lead after changes have been made. If levels are still elevated, replacement of the chiller may be necessary.

Drinking Water Fountain (Water Coolers) (See Exhibit 4.5)

Example 1:

- Sample 1C (54 ppb) = the plumbing upstream from the cooler and/or the water cooler is contributing lead.
- Sample 3C (40 ppb) exceeds Sample 2C (5 ppb) = the water cooler is contributing 35 ppb of lead.
- Sample 3C (40 ppb) exceeds Sample 2C (5 ppb) and Sample 1C (54 ppb) exceeds Sample 3C (40 ppb) = the plumbing directly upstream from the cooler is contributing 14 ppb of lead.
- Sample 2C (5 ppb) is less than 10 ppb and Sample 2C is less than Sample 1C (54 ppb) and Sample 3C (40 ppb) = the source of lead is not sediments contained in the cooler storage tank, screens, or plumbing upstream from the cooler.

Possible Solutions: Replace the cooler with one that contains lead-free components, and retest the water or find an alternative lead-free drinking water source; locate source of lead from plumbing and eliminate it *(routine flushing is not applicable as a potential remedy for water coolers – see discussion of this issue in Sections 5.2 and 5.3 of this guidance document for further information).*

Example 2:

- Samples 1C (44 ppb), 3C (42 ppb) and 2C (41 ppb) are approximately equal = the cooler is not the likely source of lead.
- Sample 1C (44 ppb) exceeds Sample 3C (42 ppb) and Sample 3C and Sample 2C (41 ppb) are close = the plumbing upstream from the cooler is contributing lead to the water.
- Samples 1C (44 ppb), 3C (42 ppb) and 2C (41 ppb) are approximately equal = the source of lead is not likely sediments contained in the cooler storage tank or screens.
- Sample 4C (43 ppb) significantly exceeds 5 ppb = the source of lead is the plumbing upstream from the cooler.

Possible Solutions: Replace the plumbing upstream between the header and cooler with lead-free materials and retest the water. If the water continues to test high, the header, service connection and/or public water supply may be the problem. An evaluation should be made as soon as possible to determine the source of the lead, and other outlets should be tested immediately if not already done. Remember that flushing is not recommended as a practical remedy for water coolers.

Bottled Water Dispensers (See Exhibit 4.6)

Example 1:

- Sample 1D (23 ppb) exceeds Sample 2D (5 ppb) = 18 ppb of lead is contributed from the dispenser unit.

Possible Solution: Replace dispenser unit with one that is made of lead-free materials and retest.

Example 2:

- Sample 1D (24 ppb) and Sample 2D (23 ppb) are close = the source of lead is the bottled water.

Possible Solutions: Purchase another type of bottled water for which the distributor provides written assurance that lead levels do not exceed federal and state lead standards, or find other alternative lead-free water source. Retest after any remedy has been employed.

Ice Making Machines (See Exhibit 4.7)

Example 1:

- Sample 1E is 22 ppb and Sample 2E (6 ppb) is close to 5 ppb = source of the lead (16 ppb) is the ice maker.

Possible Solutions: Replace plumbing components in ice maker with lead-free materials; clean debris from plumbing and screen at inlet to ice maker; replace with lead-free ice maker; retest after any remedy has been employed.

Example 2:

- Sample 1E = 22 ppb and Sample 2E (21 ppb) significantly exceeds 5 ppb = lead is contributed from the plumbing upstream from the ice maker.
- Sample 2E (21 ppb) exceeds 20 ppb = sampling from the distribution system supplying water to the ice maker is recommended *(see Exhibit 4.9 for instructions).*

Faucets (Taps) (See Exhibit 4.8)

Example 1:

- Sample 1F (39 ppb) exceeds Sample 2F (6 ppb) = 33 ppb of lead is contributed from the water faucet.
- Sample 2F (6 ppb) is close to 5 ppb = very little lead is coming from the plumbing upstream from the faucet; the majority of the lead is coming from the faucet and/or the plumbing connecting the faucet to the lateral.

Possible Solutions: Replace faucet with lead-free device (ensure compliance with the NSF standards for any fixtures you intend to purchase); replace plumbing connecting the faucet to the lateral with lead-free materials; flush outlet and connecting plumbing each day; apply point-of-use device designed to remove lead; find alternative water source such as bottled water or other lead-free location in the building; retest after any remedies are employed.

Example 2:

- Sample 1F (49 ppb) exceeds Sample 2F (25 ppb) = source of lead (24 ppb) is the water faucet and the plumbing upstream from the outlet (25 ppb).
- Sample 2F (25 ppb) significantly exceeds 5 ppb = lead may be contributed from upstream from the faucet; evaluate lead test results conducted upstream from the faucet to ascertain potential contributions of lead from the upstream piping. To pinpoint location test interior plumbing *(see instructions for sampling interior plumbing in Exhibit 4.9).*

Possible Solutions: Replace faucet with lead-free device (ensure compliance with the NSF standards for any fixtures you intend to purchase); replace plumbing connecting faucet to the lateral with lead-free materials; replace suspected portion of interior plumbing with lead-free materials; flush the outlet and interior plumbing each day; apply point-of-use device designed to remove lead; find alternative water source such as bottled water or water from other lead-free location in the building; retest after any remedies are employed.

Interior Plumbing (See Exhibit 4.9)

Example 1:

- Sample 1G (22 ppb) exceeds 20 ppb = collect additional samples from the plumbing upstream to further pinpoint the source of lead (i.e., from the service line, the riser pipe, the loop, or the header supplying water to the lateral).
- Sample 1G (22 ppb) significantly exceeds 5 ppb and is less than downstream site (35 ppb) = a portion of the lead (13 ppb) is contributed downstream from the sample site.
- Sample 1G (22 ppb) is not similar to downstream site (35 ppb) but both exceed 20 ppb = lead is contributed from the lateral or from interior plumbing upstream from the lateral; possible sources of lead may be the loop, header, riser pipe, or service connection; further sampling is necessary.

Possible Solution: Following the collection of additional samples from plumbing upstream to pinpoint sources of lead, replace plumbing with lead-free materials; retest water for lead.

Example 2:

- Sample 1H or 1J (23 ppb) exceeds 20 ppb = collect additional samples from the plumbing upstream supplying water to the loop or header; compare the results with those taken from the service line or the riser pipe that supplies water to the loop and/or header.
- Sample 1H or 1J (23 ppb) significantly exceeds 5 ppb and Sample 1H or 1J is less than downstream site (25 ppb) = a small portion of the lead (2 ppb) is contributed downstream of the sample site.

Possible Solution: Following the collection of additional samples upstream from the header or loop to pinpoint source of lead, replace affected plumbing with lead-free materials; retest water for lead.

Example 3:

- Downstream Site is 25 ppb, Service Connection Sample is 4 ppb, and Sample 1J (6 ppb) is less than 20 ppb = additional samples from upstream need not be collected; 21 ppb of lead is contributed from the downstream site.
- Sample 1J (6 ppb) is not equal to downstream site (25 ppb) = source of lead is not the riser pipe or the plumbing and service connection upstream from the riser pipe.
- 1J (6 ppb) is close to 5 ppb = the portion of the riser pipe and plumbing upstream from Sample Site 1J and the service connection are not contributing lead to the water; the source of lead is downstream of the sample site.

Possible Solution: Following the collection of samples from interior plumbing downstream from the riser pipe and the affected outlet to pinpoint the source of lead, replace affected plumbing with lead-free materials; retest water for lead.

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.	
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?	
3. When were the most recent plumbing repairs made (note locations)?	
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.	

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.	
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.	
7. Was lead solder used in your plumbing system? Note the locations with lead solder.	
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.	

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	
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.	
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.	
12. Have these screens been cleaned? Note the locations.	

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

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?	
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?	

EPA 816-B-05-008
October 2006 (Revised)
Office of Water (4606)

ATTACHMENT

6

LEAD AND COPPER RULE REVISIONS WHITE PAPER

October 2016

U. S. Environmental Protection Agency

Office of Water

Washington, DC 20460

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I. Executive Summary

Exposure to lead is known to present serious health risks to the brain and nervous system of children. The recent crisis in Flint, Michigan, has brought increased attention to the challenge of lead in drinking water systems across the country. It is important to recognize that major reductions in been achieved in childhood exposure to lead in the United States. Data show that from 1976 – 1980 the median blood lead level of a child (1-5 years old) was 15 micrograms per deciliter. That median level has been reduced dramatically since then, to 1 microgram per deciliter, based on the most recent data. Further, over the last twenty-five years, the percentage of children aged 1–5 years with blood lead levels less than or equal to 5 micrograms per deciliter declined more than ten-fold, and blood lead levels fell dramatically for all racial and ethnic groups. These improvements were made by removing lead from toys and lead solder in cans, taking lead out of gasoline, reducing exposure to lead in paint and dust in homes and during renovations, greatly reducing the allowable content of lead in plumbing materials in homes and other buildings, and further reducing lead in drinking water through the federal Lead and Copper Rule (LCR). Although we have taken significant steps to protect our children from the detrimental effects of lead poisoning, there is more to do.

Lead and copper enter drinking water mainly from corrosion of lead and copper containing plumbing materials. Lead was widely used in plumbing materials until Congress banned its use in 1986, and there are an estimated 6.5 to 10 million homes served by lead service lines (LSLs) in thousands of communities nationwide, in addition to millions of older buildings with lead solder across the U.S. Lead exposure, whether through drinking water, soil, dust or air, can result in serious adverse health effects, particularly for young children. Infants and children exposed to lead may experience delays in physical and mental development and may show deficits in attention span and learning disabilities. In adults, lead exposure can cause kidney problems and high blood pressure. Copper exposure can cause stomach and intestinal distress, liver and kidney damage, and complications of Wilson's disease in genetically predisposed people.

In 1991, EPA promulgated the LCR – a treatment technique regulation under the Safe Drinking Water Act (SDWA) – to protect public health by minimizing lead and copper levels in drinking water, primarily by reducing water corrosivity through corrosion control treatment. This rule applies to 68,000 public water systems nationwide. EPA has continued to work to make the LCR more effective through interim revisions promulgated in 2000 and 2007.

Implementation of the LCR over the past twenty-five years has resulted in major improvements in public health; the number of the nation's large drinking water systems with a 90^{th} percentile sample value exceeding the LCR action level of 15 parts per billion has decreased by over 90 percent since the initial implementation of the LCR. However, the regulation and its implementation are in urgent need of an overhaul. Lead crises in Washington, DC, and in Flint, Michigan, and the subsequent national attention focused on lead in drinking water in other communities, have underscored significant challenges in the implementation of the current rule, including a rule structure that for many systems only compels protective actions after public health threats have been identified. Key challenges include the rule's complexity, the degree of discretion it affords with regard to optimization of corrosion control treatment and compliance sampling practices that in some cases, may not adequately protect from lead exposure, and limited specific focus on key areas of concern such as schools. There is a compelling need to modernize and strengthen implementation of the rule – to strengthen its public health protections and to clarify its implementation requirements to make it more effective and more readily enforceable.

EPA has conducted extensive engagement with stakeholder groups and the public to inform revisions to the LCR. In December of 2015, EPA received comprehensive recommendations from the National Drinking Water Advisory Council (NDWAC) and other concerned stakeholders on potential steps to strengthen the LCR. EPA is carefully evaluating the recommendations from these groups. In addition, EPA is giving extensive consideration to the national experience in implementing the rule as well as the experience in Flint, MI, as we develop proposed revisions to the rule.

Key Principles for LCR Revisions

EPA's goal for the LCR revisions is to improve public health protection while ensuring effective implementation by the 68,000 drinking water systems that are covered by the rule. This includes strengthening corrosion control treatment in drinking water systems to further reduce exposure to lead and copper and identifying additional actions that will equitably reduce the public's exposure to lead and copper when corrosion control treatment alone is not effective. In developing proposed revisions to the LCR, EPA will be guided by several key principles, including:

- Focus on Minimizing Exposure to Lead in Drinking Water: Improve public health protection by reducing exposure to lead in drinking water to the maximum amount possible through proactive measures to remove sources of lead and educating consumers about the health effects of lead and actions to reduce exposure.
- Clear and Enforceable Requirements: Improve implementation by designing a more prescriptive regulation with fewer discretionary decision points that rely on the judgment of individuals in states and drinking water utilities that may lack expertise in the complexities of corrosion control treatment and distribution system management.
- Transparency: Stronger programs to educate consumers about health risks and actions to reduce exposure to lead in drinking water, better access for consumers to information related to the location of LSLs, and more rapid test results of all tap samples and water quality parameter monitoring.
- Environmental Justice and Children's Health: Because of disparities in the quality of housing, community economic status, and access to medical care, lead in drinking water (and other media) disproportionately affects lower-income people. In addition, lead has disproportionate health effects on infants and children. In revising the LCR, EPA seeks to address environmental justice concerns and to prioritize protection of infants and children who are most vulnerable to the harmful effects of lead exposure.
- Integrating Drinking Water with Cross-Media Lead Reduction Efforts: Leveraging efforts of state and local public health authorities to provide integrated approaches to comprehensively reduce exposure to lead from drinking water, paint, dust, soil and other potential sources of exposure.

EPA is carefully considering NDWAC advice and other stakeholder input and is undertaking key analytical work to develop proposed revisions to the LCR. We are considering an approach that will incorporate both technology- based and health-based elements – to ensure effective reductions of lead in drinking water at the water system level, while at the same time providing consumers with the information, tools and protections needed to address remaining risks. We anticipate that these elements will be supported by clear and robust revised sampling requirements, strengthened reporting, transparency provisions that ensure consumers have rapid access to relevant information and public education materials. Key potential elements under consideration are discussed in Section 3; these elements are highly interdependent, and potential revisions to the rule must be considered in an integrated perspective.

II. Background

Health Effects of Lead

Over the past decade, epidemiologic studies have consistently demonstrated that there is no safe level of lead. In particular, studies conducted in diverse populations of children consistently demonstrate the harmful effects of lead exposure on cognitive function, as measured by IQ decrements, decreased academic performance and poorer performance on tests of executive function. Lead exposure is also associated with decreased attention, and increased impulsivity and hyperactivity in children. In adults, long-term lead exposure results in increased blood pressure and hypertension. In addition to its effect on blood pressure, lead exposure can also lead to coronary heart disease and death from cardiovascular causes and is associated with cognitive function decrements, symptoms of depression and anxiety, and immune effects in adults.

Health Effects of Copper

Copper has been demonstrated to cause gastrointestinal distress following short term exposure and can cause liver and kidney damage during longer term exposures. Copper exposures are of particular concern for people with Wilson’s disease.

Lead in Plumbing Materials

The extent to which leaded materials occur in drinking water distribution systems and plumbing materials in homes and buildings (premise plumbing) varies across the U.S. Much of the variation is due to the quality and age of the housing stock; older homes are more likely to have pipes and plumbing materials containing lead. Where they are present, the most significant source of lead in drinking water are leaded pipes that extend from the water main underneath the street to the residence (lead service lines, or LSLs) however, faucets and fixtures with leaded brass and pipes with lead solder can also contribute to the presence of lead in drinking water. Water chemistry also plays a role in lead levels, because some water sources are more corrosive to leaded plumbing materials if not treated for corrosion control.

In 1986, Congress amended the Safe Drinking Water Act, prohibiting the use of pipes, solder or flux that are not “lead free” in public water systems or plumbing in facilities providing water for human consumption. At the time, "lead free” was defined as solder and flux with no more than 0.2% lead and pipes with no more than 8%. Prior to this, leaded materials were commonly used in plumbing materials and for service lines connecting residences and buildings to water mains. In 1996, Congress further amended SDWA to expand the prohibition to encompass plumbing fittings and fixtures and to prohibit the introduction into commerce of pipes, fitting, and fixtures, solder or flux that is not lead free. The Reduction of Lead in Drinking Water Act of 2011 created exemptions to the prohibitions and revised the maximum allowable lead content from not more than 8% to not more than a weighted average of 0.25% lead on the wetted surface; further reducing the amount of lead in contact with drinking water when that law became effective in January 2014. While these prohibitions have reduced the amount of lead allowed in covered plumbing materials after they went into effect, there are many buildings that still have LSLs and/or plumbing materials made with a higher percentage of lead than currently allowed for new installations or repairs of existing plumbing.

Summary of the Current Lead and Copper Rule

Under SDWA, EPA establishes national primary drinking water regulations (NPDWRs) which either establish a maximum contaminant level (MCL) or a treatment technique "to prevent known or anticipated adverse effects on the health of persons to the extent feasible." The Lead and Copper Rule (LCR) is a treatment technique rule, first promulgated in 1991 and revised in 2000 and 2007, which requires water systems to conduct tap sampling for lead and copper to determine the actions water systems must take to reduce exposure to lead and copper. Recognizing that there is no safe level of lead in drinking water, the LCR set a health-based maximum contaminant level goal of zero. Under the LCR, water systems must work with their customers to collect samples from locations with LSLs and/or leaded plumbing materials. The LCR established action levels of 0.015 mg/L (15 ppb) for lead and 1.3 mg/L (ppm) for copper, based on the 90th percentile sample level.

The action level for copper is set at the health-based maximum contaminant level goal for copper. The action level for lead is based upon EPA's evaluation of available data on corrosion control's ability to reduce lead levels at the tap. Corrosion control treatment (CCT) typically involves the addition of chemicals such as orthophosphate, or chemical adjustment of drinking water pH, to reduce the corrosivity of drinking water and thus the level of leaching of lead and copper from plumbing materials. Whereas an MCL is an enforceable level that drinking water cannot exceed without violation, an action level is a screening tool for determining when certain treatment technique actions are needed. If the lead or copper action level is exceeded in more than ten percent of tap water samples collected during any monitoring period (i.e., if the 90th percentile level is greater than the action level), a water system must take certain actions.

The type of action that is triggered depends upon the size of the system and the actions it has taken previously. All water systems serving more than 50,000 people were required to install corrosion control treatment soon after the LCR went into effect. Systems serving less than 50,000 people are not required to install corrosion treatment if the system meets the lead and copper action levels during each of two consecutive six-month monitoring periods. Systems serving less than 50,000 people that exceed the action level and have not yet installed CCT must begin working with their state to monitor water quality parameters and install and maintain CCT. Any system that exceeds the lead action level must conduct public education. Any system with LSLs that exceeds the lead action level after installing CCT must begin LSL replacement (LSLR). Although LSLR programs are conducted by public water systems, in many cases, the portion of the LSL that extends from the water main to the residential property line is owned by the water system, while the portion of the line that extends from the property line to the home is solely owned by the homeowner. Under the current rule, water systems conducting LSLR must offer building owners the opportunity to replace their portion of the line at the time the system is replacing the portion of the service line owned by the system, but the system is not obligated to pay for replacing the portion of the line it does not own.

Key Challenges with the Current Lead and Copper Rule

The LCR is one of the most complicated drinking water regulations for states and drinking water utilities to implement due to the need to control corrosivity of treated drinking water as it travels through often antiquated distribution and plumbing systems on the way to the consumer's tap. The LCR is the only NPDWR that requires sampling in homes, often by the consumers themselves. The rule includes complex sampling and treatment technique requirements intended to protect against exposure to lead and copper in drinking water. States and public water systems must have expertise and resources to identify the sampling locations and to collect and analyze samples correctly. Even greater expertise is needed for systems and states to identify on a system-specific basis the optimal CCT and water quality parameter monitoring to assure effective operation. The current structure of the rule compels additional protective actions on the part of a water system only after a potential problem has been identified, which may create a disincentive for utilities to identify potential problems with lead and copper in the drinking water system. It is also worth noting that road construction activities or maintenance of gas or buried power lines can cause disturbance of LSLs, in some cases introducing high levels of lead into drinking water through the release of lead particulates into the drinking water distribution system.

When corrosion control alone is not sufficient, LSLR, public education, and further actions on the part of consumers to reduce their exposure to lead are necessary. Consumers' ability to understand and afford these actions can pose challenges. In most communities, LSLs are partially owned by the utility and partially owned by the homeowner; the cost of full LSLRs has been estimated to be $2,500-$5,500 per line, but some industry estimates for an average replacement are as high as $8,700 per line.

Summary of National Drinking Water Advisory Council Recommendations

The National Drinking Water Advisory Council (NDWAC) is a Federal Advisory Committee that supports EPA in performing its duties and responsibilities related to the national drinking water program. The council was created through a provision in the SDWA of 1974. The NDWAC LCR Working Group was formed to provide advice to EPA in considering potential revisions to the LCR. In December 2015, the NDWAC provided specific recommendations to the Administrator for LCR revisions including:

- Require proactive LSLR programs, which set replacement goals, effectively engage customers in implementing those goals, and provide improved access to information about LSLs, in place of current requirements in which LSLs must be replaced only after a lead action level exceedance (ALE);
- Establish more robust public education requirements for lead and LSLs, by updating the Consumer Confidence Report (CCR), adding targeted outreach to consumers with LSLs and other vulnerable populations (pregnant women and families with infants and young children), and increasing the information available to the public;
- Strengthen CCT, retaining the current rule requirements to re-assess CCT if changes to source water or treatment are planned, adding a requirement to review updates to EPA guidance to determine if new scientific information warrants changes;
- Modify monitoring requirements to provide for consumer requested tap samples for lead and to utilize results of tap samples for lead to inform consumer action to reduce the risks in their homes, to inform the appropriate public health agency when results are above a designated household action level, and to assess the effectiveness of CCT and/or other reasons for elevated lead results;
- Tailor water quality parameters (WQPs) to the specific CCT plan for each system, and increase the frequency of WQP monitoring for process control;
- Establish a health-based, household action level that triggers a report to the consumer and to the applicable health agency for follow up;
- Separate the requirements for copper from those for lead and focus new requirements where water is corrosive to copper; and
- Establish appropriate compliance and enforcement mechanisms.

Summary of Other Stakeholder Input

EPA has also received recommendations for revisions to the LCR from other stakeholders including a NDWAC Working Group member who dissented on a number of the NDWAC recommendations, the

Flint Water Interagency Coordinating Committee, and local citizens impacted by the experience in Flint. These recommendations emphasize the importance of enforceable goals for LSLR, recognize the significant lead exposure risks that can accompany partial service line replacements (PLSLRs) and provide clearer and more prescriptive requirements for sampling and corrosion control protocols that reduce the opportunities for systems to generate biased sampling results or improperly implement corrosion control procedures. EPA has received input from other stakeholders similarly concerned with eliminating PLSLRs and strengthening the sampling and corrosion control provisions of the LCR. In addition, the Board of the American Water Works Association (AWWA), which represents drinking water utilities, voted unanimously in March of 2016 to support the NDWAC recommendations, including those that would ultimately lead to complete replacement of LSLs.

III. Key Issues and Potential Elements under Consideration

EPA expects that proposed revisions to the LCR will include both technology-driven and health-based elements that focus on proactive, preventative actions to avoid high lead levels and health risks. In addition, we expect to propose robust and ongoing communication and information sharing with consumers that will foster actions by consumers to reduce risks. The potential elements under consideration are interconnected components that together will address the challenges with the current rule and improve public health protection in the revised rule.

In developing revisions to the LCR, EPA must adhere to the SDWA's statutory requirements and achieve the greatest public health protection feasible. The SDWA requires that any treatment technique rule must prevent known or anticipated adverse effects on the health of persons to the extent feasible and revisions to any NPDWR must maintain or strengthen public health protection. In addition, EPA must prepare a Health Risk Reduction Cost Analysis to evaluate if the benefits justify the costs of the rule. EPA is committed to using the best available science. As knowledge about lead contamination in drinking water evolves, we will continue to engage with stakeholders and consider their viewpoints and relevant science in developing revisions to the LCR.

Lead Service Line Replacement

As noted above, LSLs, which connect a residence or building to the water main, can be a significant source of lead in drinking water. The total number of LSLs currently in use in the US is unknown; estimates range from 6.5 million to greater than 10 million homes that have service lines that are at least partially made of lead. The current LCR requires LSLR only after a lead ALE, and allows partial LSLR when an owner of a home or building is unable or unwilling to pay for replacement of the portion of the service line not owned by the water system.

In 2010, EPA asked its Science Advisory Board to evaluate the data regarding the effectiveness of the partial LSLR, in comparison to full line replacement. The EPA Science Advisory Board concluded in its 2011 report to EPA that:

> PLSLRs have not been shown to reliably reduce drinking water lead levels in the short term, ranging from days to months, and potentially even longer. Additionally, PLSLR is frequently associated with short-term elevated drinking water lead levels for some period of time after replacement, suggesting the potential for harm, rather than benefit during that time period. Available data suggest that the elevated tap water lead levels

tend to then gradually stabilize over time following PLSLR, sometimes at levels below and sometimes at levels similar to those observed prior to PLSLR. [1]

Much of the discussion regarding potential LCR revisions has focused on mandatory, proactive LSLR, as a potential opportunity to eliminate one of the primary sources of lead in drinking water, thus reducing reliance on corrosion control to reduce lead in drinking water at the tap.

The NDWAC has recommended that the Agency require proactive full LSLR programs with the following elements:

- Requiring all PWSs to establish a LSLR program that effectively informs and engages customers to encourage them to share appropriately in fully removing LSLs, unless the system can demonstrate that LSLs are not present in their system;
- Targeted outreach to customers with LSLs, with information about the risks of lead exposure, an offer to test a tap sample, and information about and encouragement to participate in the LSLR program;
- Dates by which systems should have met interim goals and completed replacement of all LSLs and partial LSLs, without penalty to the water system for those homeowners who refuse to participate in the replacement program as long as the water system has made a meaningful effort to work with such a homeowner;
- Creating incentives for understanding where LSLs and PLSLs exist, while making action on full replacement, rather than on investigation of the location of LSLs and PLSLs the priority;
- Maintaining ongoing-outreach to homeowners where LSLs or PLSLs still exist;
- Implementation of standard operating procedures (SOPs), either from EPA guidance or tailored to the system, that helps define operations that disturb LSLs and practices to minimize disturbance and consumer exposure to lead; and
- Stronger programs to educate consumers, and to provide test results of tap samples at the request of consumers.

It is important to recognize that LSLR presents substantial economic, legal, technical and environmental justice challenges. First, it is costly. Estimated costs for LSLRs range from $2500 to more than $8000 per line, suggesting an estimated cost of eliminating all 6.5 to 10 million LSLs nationwide ranging from 16 to 80 billion dollars. Potential costs may be disproportionately borne by specific low-income localities, such as Detroit, which has an estimated 100,000 LSLs and where 40 percent of the population is below the poverty line. Second, LSLs are often partially or totally owned by private homeowners. Under the current LCR, public water systems are responsible for replacement of LSL or the portion of the LSL it owns. This is typically the portion of the line from the water main to the property line. There are important legal questions about EPA's authority to mandate replacement of privately owned portions of lines and about water systems' authority under state or local law to require and/or pay for such replacement. To the extent water systems rely on homeowners to pay for replacement of privately owned portions of lines, there are concerns about consumer's ability to pay and the possibility that lower-income homeowners will be unable to replace lines, resulting in disparate levels of protection. However, a number of cities and towns across the nation have successfully implemented full LSLR and have developed innovative approaches to addressing these challenges, including Lansing, Michigan; Madison, Wisconsin; and more recently Boston, Massachusetts – and EPA is looking at this experience in the context of developing proposed revisions to the LCR.

[1] Science Advisory Board, U.S. Environmental Protection Agency, "Evaluation of the Effectiveness of Partial Lead Service Line Replacements," transmitted to Lisa Jackson, EPA Administrator, September 28, 2011.

EPA is considering proposing full LSLR programs. In assessing options for an LCR revision proposal, EPA is evaluating a number of important issues, including:

- The appropriate pace of LSLR and the mechanism for implementing and enforcing any LSLR program requirements. Consideration of number of LSLs that can feasibly be replaced on an annual basis will need to be considered as well as water system size.
- Costs and benefits of LSLR for reducing lead exposures. National costs could range from 16 to 80 billion dollars. Benefits will be estimated based upon avoided effects of lead exposure such as IQ loss in developing children. EPA will evaluate how much additional lead exposure reduction can be achieved in removing LSLs from water systems with optimized corrosion control. EPA will also evaluate other measures that can reduce lead exposure to assure that resources are focused on reducing the most significant sources of lead.
- How to provide for full LSLR where the utility does not own the full line, including an evaluation of whether a potential change to the definition of "control" under the SDWA would facilitate full LSLR.[2]
- Requiring drinking water utilities to update their distribution system materials inventory to identify the number and location of LSLs in their system.
- How to address potential equity concerns with LSLR requirements and consumers ability to pay for replacement of their portion of the LSL. Identifying and evaluating incentive and creative funding mechanisms are critical as is encouraging use of Drinking Water State Revolving Fund to the extent possible.
- How to address LSLR in rental properties, particularly where low income residents do not control the property or have the ability to contribute to the cost of LSLR.
- Whether to prohibit or otherwise limit partial LSLR, and how to address concerns related to potential disturbance of LSLs during emergency repairs to water mains that are connected to LSLs.
- How to address the short term increases in lead levels that can follow LSLRs (i.e., requiring water systems to provide filters when lines, or enhanced household flushing recommendations).

Improved Optimal Corrosion Control Treatment Requirements

Optimal Corrosion Control Treatment (OCCT) is the primary treatment technique on which the LCR focuses, and as noted above, it has been successful on a national basis in reducing lead and copper levels at the tap. Even if the revised LCR includes requirements for full LSLR, full replacement of LSLs would likely take decades to complete, and LSLR will not address potential risks from lead and copper materials present in premise plumbing in tens of millions of homes across the U.S. As a result, CCT requirements will continue to be a key element of a revised LCR.

Since the initial implementation of the LCR, systems have faced ongoing challenges of continuing to maintain optimal corrosion control while making necessary adjustments to treatment processes or system operations unrelated to corrosion control to comply with other NPDWRs. Determining whether treatment is optimized can be challenging for individual systems, given the wide variability in

[2] The Safe Drinking Water Act defines the term public water system as "…a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves at least twenty-five individuals. Such term includes (i) any collection, treatment, storage, and distribution facilities ***under the control of*** the operator of such system and used primarily in connection with such system, and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system."

distribution system composition, source water characteristics and approaches to complying with other NPDWRs, such as the surface water treatment rules. While the impact of changes in some water quality parameters on lead and copper levels are well understood, such as fluctuations in pH or alkalinity, others are more complex, such as the quantity and type of disinfectant used or the chemical composition of the protective scales within the LSLs. Small and medium systems (those serving <50,000 persons) are not required to commence development of a CCT plan under the existing LCR unless they have a lead ALE.

The NDWAC recommends that:

- EPA release a revised CCT guidance manual as soon as possible and update this manual every six years, so that PWSs and primacy agencies can take advantage of improvements in the science;
- EPA provide increased expert assistance on CCT to PWSs and primacy agencies;
- The LCR continue to require re-evaluation of CCT when a PWS makes a change in treatment or source water;
- The LCR continue to require water quality parameter monitoring to ensure that the OCCT is achieving the treatment objectives and that EPA consider requiring such monitoring on a more frequent basis with additional guidance on process control methods; and
- Large systems review their existing CCT plan in light of current science in a newly revised guidance manual with their primacy agency to determine whether the WQPs reflect the best available current science.

Recognizing the continuing central importance of CCT in reducing lead exposures, EPA is considering a range of options for strengthening CCT requirements in the proposed rule that could help to provide clearer requirements, reduce uncertainty, and ensure broader and more consistent proactive application of CCT to avoid high lead levels. Options under consideration include:

- Requiring large water systems (serving > 50,000 persons) to evaluate and re-optimize CCT when EPA publishes updated CCT guidance. This option would provide a mechanism to ensure water systems are considering the best available science to inform treatment decisions.
- Given that CCT is also effective at reducing lead leaching in premise plumbing (not just LSLs), requiring all systems in the U.S. to implement CCT, regardless of system size, tap sampling results, or the presence of LSLs; or alternatively, broadening the categories of systems for which CCT is required; requiring all systems to assume that their distribution system includes the presence of LSLs unless or until they provide the primacy agency with a robust distribution system materials evaluation that demonstrates that this is not the case.
- Requiring water systems that are already applying CCT that exceed the lead action level to evaluate and re-optimize CCT.

Incorporating a Health-Based Benchmark to Strengthen Protection

Although the current LCR is focused on protecting public health by reducing lead and copper exposures, it does so through "technology-based" requirements. The 1991 LCR established an action level for lead of 15 ppb (for the 90th percentile sample) based on an assessment that it was generally representative of effective CCT. Although public discussion often mistakes the action level as having significance in terms of health impacts, EPA has consistently emphasized that the health-based maximum contaminant level goal (MCLG) for lead in the current LCR is zero and that there is no safe level of lead exposure. While the future LCR will maintain treatment technique requirements (e.g., CCT, public education and LSLR) to reduce lead exposures, a health-based benchmark for lead in drinking water could help to guide appropriate actions to communicate and mitigate risk, particularly at the household level.

As part of its 2015 recommendations, the NDWAC suggested that EPA establish a "household action level" based on the amount of lead in drinking water that would raise an average, healthy infant's blood lead level to greater than five micrograms per deciliter based on consumption of infant formula made with water. According to the NDWAC recommendations, water systems would be required to notify the consumer and the local public health agency if this level were exceeded – with the expectation that individuals and local officials will use this information to take prompt actions at the household level to mitigate lead risks.

While EPA has not yet determined the specific role of a health based benchmark for lead in drinking water in the new rule, the Agency sees value in providing states, drinking water systems and the public with a greater understanding of the potential health implications for vulnerable populations of specific levels of lead in drinking water. EPA is currently developing up-to-date scientific modeling of the relationship between lead levels in drinking water and blood lead levels – particularly for sensitive lifestages such as formula-fed infants and children under age 6. EPA expects to conduct an expert peer review panel to identify approaches to derive a health based value for lead in drinking water. Following this public peer review process, EPA expects to evaluate and determine what specific role or roles a health-based value may play in the revised LCR. EPA anticipates that the proposal will consider the "household action level" approach recommended by the NDWAC, but a health-based value could also help to inform other potential elements of a revised LCR – including public education requirements, prioritization of households for LSLR or other risk mitigation actions at the household level, and potential requirements related to schools or other priority locations.

Considering the Potential Role of Point of Use Filters

One of the insights that has emerged from work in response to the crisis in Flint, Michigan, is the efficacy of point-of-use household filters in reducing lead levels at the tap. There are a broad array of point-of-use filters that are certified by independent third party labs for lead reduction. Recently, EPA collected samples from these filters installed on taps in Flint, Michigan, and verified that these filters are effective in reducing lead levels. Filters require periodic replacement of cartridges to remain effective. The SDWA requires point of use devices specified as a feasible technology to achieve compliance with an MCL or treatment technique requirements to be owned, controlled, and maintained by the water utility. While filters are not an appropriate substitute for CCT, LSLR, or other actions to properly manage and reduce lead levels at the system level, EPA is considering role for filters in addressing risks from lead and copper at the household level. Potential roles include requiring point of use filters where there has been a disturbance of a LSL or where tap sampling indicates an exceedance of a health-based benchmark or action level.

Clarify and Strengthen Sampling Requirements

The goal of the LCR sampling requirements – including site selection criteria and tap sampling procedures — is to cost effectively assess the effectiveness of a water system's CCT and to trigger additional actions to reduce exposure when necessary. The target locations in the LCR are focused on the homes that are likely to have the highest risk for lead exposure. The lead sampling protocol requires a one liter first draw sample collected after water has remained stagnant for at least 6 hours. Implementation of the sample site selection criteria and the sampling protocol are challenging and provide opportunity for error, particularly given that samples are collected by the residents themselves. In addition, numerous stakeholders have criticized the current rule as providing too much discretion in sampling approaches and providing opportunities for systems to implement their sampling procedures to avoid exceeding the action level, even in circumstances where corrosion control has not been optimized.

On February 29, 2016, EPA issued a memorandum encouraging states and drinking water utilities to implement protective LCR sampling procedures, based on lessons learned in Flint, Michigan, and other communities. These sampling procedures include eliminating the practice of flushing the tap prior to the mandatory 6-8 hour stagnation period (pre-stagnation flushing), ensuring that faucet aerators are not removed prior to conducting tap sampling under the LCR, and encouraging the use of wide mouth bottles for collection of tap samples to avoid the loss of any of the first draw sample. EPA expects to incorporate each of these recommended sampling procedures as proposed requirements in the proposal for the revised LCR.

In addition, EPA has increased oversight of state programs to ensure effective implementation of the LCR. As part of these efforts, EPA sent letters on February 29, 2016, to state commissioners to ensure consistency with EPA regulations and guidance. The letter requested that primacy agencies work collaboratively with EPA to ensure national consistency and improve transparency and public information regarding the implementation of the rule.

The majority of the states confirmed that they have been consistent with EPA guidance and the LCR. Some primacy agencies specifically stated in their response that they would be undertaking steps to ensure that their protocols and procedures follow the LCR and applicable guidance. Regarding the use of EPA guidance on LCR sampling protocols and optimization corrosion control procedures, the majority of the primacy agencies confirmed that they use relevant guidance and protocols for sampling and corrosion control. Some primacy agencies had previously encouraged pre-flushing but stated they would update their protocols to ensure consistency with the recently published EPA sampling memo.

The NDWAC recommends that a voluntary customer-initiated sampling program based on a more robust and targeted public education be substituted for the current LCR tap sampling requirements.
The results of the voluntary tap sampling program would be used for three separate purposes:

- Informing and empowering individual households to take action to reduce risk;
- Reporting to health officials when monitoring results exceed a “household action level”; and
- Providing an ongoing source of information to the utility to assess effectiveness of CCT.

In the proposed LCR revisions, EPA intends to propose clear and robust sampling requirements to serve the goals of: (1) providing appropriately robust information on how the overall system is performing in reducing lead levels; and (2) providing information on household levels that can be compared to health-based levels, to help guide mitigation actions at individual homes.

EPA is continuing to evaluate specific procedures for tap sampling, including:

- The continued use of “first draw” tap samples, sequential sampling to characterize lead levels in drinking water that has been in contact with premise plumbing and the LSL, random daytime samples, whether the rule should include a variety of tap sampling protocols to meet different needs for customers and the system, and whether the rule should provide for systems to sample customer’s taps on request.
- Mandatory sampling for schools that are not public water systems in the revised LCR, given the presence of vulnerable populations in the school environment and the ongoing challenges that schools continue to encounter with elevated lead levels in drinking water.

- ORD partnering with technology developers in industry and academia to identify available technologies that can be used to support real-time monitoring of water quality parameters for measuring the effectiveness of corrosion control in the distribution system.

Increased Transparency and Information Sharing

Transparency and public sharing of data and information is a cornerstone of EPA's efforts to strengthen the effectiveness of its rules. The drinking water crisis in Flint, Michigan, and subsequent focus on lead issues in other communities has underscored the need for transparency with the public in implementing actions to reduce lead in drinking water. EPA took important steps to advance these efforts on February 29, 2016, when the Agency sent letters to every governor and drinking water primacy agency responsible for implementing the LCR, urging a series of actions to address risks from lead in drinking water. The Agency called on primacy agencies to work with public water systems to increase transparency in implementation of the LCR by posting on their public websites:

- the materials inventory that systems were required to complete under the LCR, including the locations of LSLs, together with any more updated inventory or map of LSLs and lead plumbing in the system; and
- LCR compliance sampling results collected by the system, as well as justifications for invalidation of LCR samples.

The Agency also asked that states enhance efforts to ensure that residents promptly receive lead sampling results from their homes, together with clear information on lead risks and how to abate them, and that the general public receives prompt information on high lead levels in drinking water systems.

Many of the responses from state commissioners identified practices and policies that enhance the implementation of the LCR and increase public transparency. States identified opportunities to promote transparency at the state level by posting individual lead compliance samples, and not just the 90th percentile values on their public websites utilizing the Drinking Water Watch or similar tools. To complement this effort, some public water systems are providing online searchable databases that provide information on known locations of LSLs, or providing videos that show homeowners how to determine whether their home is served by a LSL.

To shorten reporting and notice timeframes, some states have adopted more stringent timelines for water systems to provide consumer notices to all who receive water from sites that were sampled and resulted in a lead ALE. While the LCR allows up to 30 days, some states are requiring notice to consumers as quickly as 48 hours after sampling. In addition, some states require laboratories that analyze lead compliance samples to contact the state within 24 hours of confirming that a sample analysis has exceeded the 15 parts per billion action level for lead. Consistent with the EPA's 2013 E-Reporting Policy[3] the agency intends to use, to the maximum extent practicable, common agency tools, information systems, and data sets for E-Reporting for the revised LCR. E-Reporting can facilitate faster access to data and other information critical to consumers to understand lead and copper levels in their drinking water and within the water system and to make informed decisions regarding actions they may take to reduce exposure from lead in drinking water.

The NDWAC recommends that EPA strengthen requirements for public access to information about LSLs, tap monitoring results and other relevant information. Enhanced requirements for sharing compliance

[3] https://www.epa.gov/compliance/policy-statement-e-reporting-epa-regulations

data and other information with the public can play a critical role in strengthening the protections provided by the LCR. By providing individuals and communities with prompt and accurate information, the LCR can help to leverage broader public involvement and engagement in ensuring accountability, consistency in meeting regulatory requirements, and prompt action to mitigate high lead levels or other risks, both at the system and household level.

Accordingly, the agency expects to propose stronger public transparency elements for the revised LCR. Measures under consideration include:

- Requiring drinking water utilities to post all LCR sampling results and sample invalidation justifications on their publicly accessible website in a form that protects the privacy of customers;
- Mandating shorter time frames for providing lead sampling results to consumers;
- Mandating shorter time frames for providing the public with public health education when high lead levels are detected in their drinking water system;
- Enhanced requirements for sharing the results of the materials evaluation conducted by drinking water system, including publicly identifying the location of LSLs within the community in a way that protects privacy of homeowners;
- Enhanced requirements for states to publicly identify each system within their state that is currently or has recently experienced an ALE, along with the specific steps the system is required to fulfill and their progress in implementing these requirements
- Requiring systems to provide information on the number of lead tap samples collected, number of samples that exceed the lead action level, information about voluntary sample results and any recent changes to CCT or water quality parameters that might affect lead levels in their water; and
- Requiring more timely electronic reporting of sampling results to primacy agencies and EPA.

Public Education Requirements

A critical element of the LCR is public health education to ensure that the public has easy access to clear information on lead and copper risks in drinking water and how to mitigate them. The current LCR requires public health education in response to a lead ALEs. One concern with this approach is that systems can have up to 10 percent of homes with highly elevated levels of lead in drinking water without causing an ALE and triggering the public health education requirements of the rule.

The NDWAC recommends that:

- EPA establish an easily accessible, national clearinghouse of information about lead in drinking water to serve the needs of the public and of public water systems;
- Require information be sent to all new customers on the potential risks of lead in drinking water;
- Revise the current CCR language to address LSLs and update the health statements;
- Add requirements for targeted outreach to customers with LSLs; and
- Expand the current requirements for outreach to caregivers/health care providers of vulnerable populations.

EPA is considering modifications to the rule to strengthen the public education requirements by requiring ongoing, proactive and targeted public education to effectively communicate drinking water lead risks, promote tap sampling, and provide actions consumers can take to reduce lead exposures regardless of ALEs by the system.

The Agency is also considering requiring water utilities to provide information on lead risks to all new customers at the time of service connection, expanding the current LCR requirements for public outreach to caregivers and healthcare providers for vulnerable populations, and revising the current requirement for CCRs so that these reports address the status of LSLs in each city.

Customers with LSLs are at heightened risk for lead exposures in drinking water. EPA is considering a number of potential public education requirements in the proposed LCR revisions to help mitigate these risks, including:

- Requiring water systems to provide targeted outreach to customers with LSLs and to provide these customers with invitations to have their water tested and to participate in a LSLR program, regardless of ALEs in the system;
- Requiring water system to provide public access for LSL inventories, which would include the locations of those service lines;
- Requiring that customers be notified of emergency or planned maintenance that may disrupt LSLs, therefore increasing lead levels, and be provided with information on actions that can be used to mitigate exposure; and
- Requiring a standard operating procedure be prepared and provided to other utilities who may disturb LSLs for maintenance or capital improvements.

Potential Revised Copper Requirements

Published corrosion literature since 1991 on copper has shown that copper and lead leaching patterns differ. The current LCR sample site selection criteria targets highest-risk lead sites, and tap samples for both lead and copper are collected at these locations. Some stakeholders have expressed concerns that elevated levels of copper may be missed using this approach.
The NDWAC Recommends:

- Instead of basing action on the results of routine, in-home copper sampling, actions should be based on the aggressiveness of the water to copper. Systems can determine if their water is aggressive to copper by doing WQP monitoring in the distribution system. All PWSs should be assumed to have water that is aggressive to copper unless they demonstrate that it is not.
- EPA should develop criteria to define water that is not aggressive to copper for the purpose of establishing whether a system falls into that category (or “bin”) for the purposes of the LCR. EPA should consider the accuracy and potential variability of pH and alkalinity monitoring as well as corrosivity to copper in establishing pH and alkalinity ranges. The criteria also should include consideration of passivation time.
- PWSs can choose one of several approaches to demonstrate that their water is not aggressive to copper.
- PWSs with water classified as non-aggressive to copper must continue to demonstrate that the water is non-aggressive. PWS’s can choose to:
    - Maintain those WQPs that demonstrate it maintains non-aggressive water, or
    - Conduct copper sampling at vulnerable homes (houses < 2 years old with new copper plumbing) to demonstrate that water chemistry is non-aggressive cooper levels fall under the AL/MCL).

EPA is considering modifications to the LCR requirements to provide greater attention to the potential risks associated with elevated levels of copper in drinking water. Options that are being considered include modifications to the sample site selection criteria to include sites that are at greatest risk of producing elevated levels of copper, and developing water quality parameters designed to identify systems that have water aggressive to copper. Systems with aggressive water could be required to install CCT and/or conduct public education for copper, while systems with nonaggressive water could be required to periodically demonstrate that leaching of copper is not a concern for the water system.

Relationship with Broader Lead Issues

While the LCR revisions are focused on lead in drinking water, EPA recognizes that the ultimate goal is comprehensive reduction in exposures to lead from all contaminated media, some of which may present greater risks than drinking water in individual communities or homes.

Lead can be ingested from various sources, including lead paint and house dust contaminated by lead paint, as well as soil, drinking water, and food. The effects of lead exposure are generally measured by blood lead levels. As a result of the multitude of possible exposure pathways, the contribution from specific pathways (e.g., consumer products, diet, soil, ambient air) to blood lead concentrations can vary widely for each individual.

Young children, infants, and fetuses are particularly vulnerable to lead because their behavior patterns typically lead to higher exposures, they absorb a greater proportion of the lead they ingest than adults, physical and behavioral effects of lead occur at lower exposure levels in children than in adults, and the central nervous system of children undergoes rapid development and impacts during this period can have lifelong effects.

EPA estimates that drinking water can make up 20 percent or more of a total exposure to lead. In some circumstances, infants who consume mostly mixed formula can receive 40 percent to 60 percent of their exposure to lead from drinking water. Current water sampling protocols were designed to assess the adequacy of CCT, not the level of human exposure to lead. Important fluctuations in water lead levels can be missed because of limitations inherent in sampling protocols that EPA uses, making it difficult to assess household exposure through drinking water.[4]

Pathways of exposure to lead related to ambient air include both inhalation of lead and ingestion of lead in dust or soil that originated in the ambient air. For example, dietary lead exposure may be air-related if ambient air lead deposits on plant materials or in water that becomes available for human consumption. (They may also be water-related if cooking is undertaken in tap water with high lead levels.)

Dust and soil particles containing lead are typically in the size range that is ingested rather than inhaled. However, soil can act as a reservoir for deposited lead emissions, and exposure to soil contaminated with deposited lead can occur through re-suspended particulate matter as well as hand-to-mouth contact, which is the main pathway of childhood exposure to lead.

To address these concerns, EPA is committed to continuing to work with federal, state and local partners to reduce lead risks in all contaminated media**.**

[4] Brown, Mary Jean and Margolis, Stephen, Division of Emergency and Environmental Health Services, National Center for Environmental Health, Centers for Disease Control, “Lead in Drinking Water and Human Blood Lead Levels in the United States,” *Morbidity and Mortality Weekly Report*, August 10, 2012.

IV. Conclusion

It is critical that EPA thoughtfully revise the LCR to strengthen the rule to reduce exposure to lead in drinking water, especially for infants and children and communities bearing a disproportionate risk. It is also important that LCR revisions improve implementation and enforceability of the rule requirements. This paper provides examples of regulatory provisions EPA is considering and evaluating in order to improve public health protection. While EPA has received extensive recommendations from NDWAC and other stakeholders, the Agency is committed to continue to engage with stakeholders and consider all viewpoints in revising the LCR. EPA is committed to using the best available science and to conducting robust analyses of regulatory options that have been informed by stakeholder input. The Agency welcomes input and feedback on the ideas presented in this paper to support development of a Notice of Proposed Rulemaking of LCR Revisions for publication in the Federal Register and public review and comment in 2017.

ATTACHMENT

7

United States Environmental Protection Agency

Implementing the Lead Public Education Provision of the Lead and Copper Rule:

A Guide For Community Water Systems

(Original Document: Lead in Drinking Water Regulation:
Public Education Guidance for Community Water Systems, EPA 816-R-02-010, June 2002)

(Revised Document: Implementing the Lead Public Education Provision of the LCR,
A Guide for Community Water Systems: EPA 816-R-08-007, June 2008)

Table of Contents

Objective and Organization

This guidance document explains the revised requirements for a lead Public Education (PE) program, describes a practical approach for successfully carrying out a PE program on lead in drinking water, and continues to serve as a tool to assist water suppliers with conducting a community-based, PE program on lead in drinking water. The approach described here is based on our National Primary Drinking Water Regulations (NPDWRs) for lead and copper, practical experience gained from implementing the PE requirements of the Lead and Copper Rule (LCR), and principles of good risk communication. This guidance is not a rule, but is intended to explain EPA's PE rules and provide recommendations on "best practice" approaches that systems might want to consider in complying with these rules. While compliance with the PE rules is required, following the recommendations and tips is optional.

The Environmental Protection Agency (EPA), first issued this guidance document in July 1992. Since that time, EPA published minor revisions to the NPDWRs for lead and copper on January 12, 2000 (65 FR 1950). On October 10, 2007, EPA published an additional set of short-term revisions and clarifications (72 FR 57782). These most recent changes to the LCR incorporate comments received from members of the National Drinking Water Advisory Committee (NDWAC) Work Group on Public Education (WGPE), water systems, utility organizations, and States. These groups have extensive experience implementing or overseeing public education (PE) programs. The new rule requirements make changes to the content of the messages provided to consumers, how the materials are delivered to consumers, and the timeframe in which materials must be delivered. The rule changes still require water systems to deliver PE materials after a lead action level exceedance. A summary of the revised PE requirements for community water systems (CWS) is provided in Tables 1, 1A, 2, and 3 in Section 1.

Under the authority of the Safe Drinking Water Act, EPA set the action level for lead in drinking water at 15 ppb. This means utilities must determine whether water from the customer's tap exceeds this level in at least 10 percent of the homes sampled (i.e. 90th percentile level). If the 90th percentile level does exceed this limit, then the utility must take certain steps to correct the problem. One action a utility must take following a lead action level exceedance is to conduct public education (no public education is required if only the copper AL is exceeded).

For utilities seeking to quickly identify the basic public education requirements after a lead action level exceedance, we have developed a five page fact sheet summarizing requirements (Appendix E).

Many systems have already developed PE programs, but we believe that systems, both large and small, will find this document useful in understanding the modifications to the PE requirements resulting from the most recent LCR changes and helping them to develop more effective PE programs.

The guidance manual is divided into the following sections:

- **Introduction** provides a discussion of the health effects of lead, a brief history of the LCR regulations, and discusses the importance of conducting a thorough PE program that is grounded in strong risk communication principles.
- **Section I: PE Program Requirements** summarizes requirements that water suppliers must meet to comply with the Federal regulations and how the latest LCR rule changes have impacted these requirements.

- **Section II: Designing an Effective PE Program** suggests practical steps a water system can take to plan a PE program prior to an exceedance.
- **Section III: Implementing Your PE Program** discusses how a water system can implement their PE requirements in the event of an exceedance; details tips for preparing materials needed to effectively communicate with the public; and provides practical tips on working with the media and communicating directly with the public.

This document contains five appendices:

- **Appendix A: Frequently Asked Questions about Lead in Drinking Water**
- **Appendix B: PE Materials Templates**
- **Appendix C: Contacts/Additional Sources of Information**
- **Appendix D: Lead and Copper Rule Public Education Requirements—Federal Regulatory Language**
- **Appendix E: Lead and Copper CWS Public Education Fact Sheet**

Introduction

Reducing lead in the environment is an important public health issue. Lead, a metal found in natural deposits, is harmful to human health. The most common exposure to lead is swallowing or breathing in lead paint chips and dust. However, lead in drinking water can also be a source of lead exposure. Lead is used in some water service lines and household plumbing materials. Lead in water usually occurs through corrosion of plumbing products containing lead. Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development. EPA has taken a number of actions to limit our total exposure to lead, such as phasing out the use of lead in gasoline and banning lead based paint. As a result of EPA's actions and those of other government agencies, total exposure to lead is much lower today than in the late 1970s.

On June 7, 1991, EPA promulgated provisions to the maximum contaminant level goals (MCLGs) and NPDWRs for controlling lead and copper in drinking water (56 FR 26460). We modified this rule with four technical amendments that were published in the Federal Register on July 15, 1991 (56 FR 32113), June 29, 1992 (57 FR 28785), June 30, 1994 (59 FR 33860), and minor revisions to reduce the reporting burden were published on January 12, 2000 (65 FR 1950). Beginning in 2004, EPA conducted a national review of implementation of the Lead and Copper Rule (LCR) to determine if there was a national problem related to elevated lead levels in drinking water. Our review placed a focus on determining if the existing rule was being effectively implemented by states and local communities and on identifying where additional guidance or changes to the regulation were needed to improve implementation. During 2004, Congress held a number of oversight hearings to further investigate implementation of the LCR in the District of Columbia and the nation.

On October 10, 2007, EPA published the latest changes to the LCR. These revisions are intended to better ensure that at-risk populations receive information quickly and are able to act to reduce their exposure. It is EPA's belief that these changes will also help water systems to better comply with the PE requirements.

The LCR requires water suppliers to deliver water that is minimally corrosive, thereby reducing the likelihood that lead and copper will be introduced into the drinking water from the corrosion of lead and copper plumbing materials. In addition, it requires water suppliers to educate their customers about specific measures that can be used to reduce lead levels in home drinking water caused by lead in household plumbing materials — the primary source of lead in drinking water.

The LCR specifies that a water system must conduct a PE program on lead in drinking water if, during a monitoring period, more than 10 percent of the tap water samples collected in accordance with 40 CFR §141.86 of the regulations (i.e., the 90th percentile lead level) exceed the EPA "action level" of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Specific requirements regarding the content and delivery of PE materials are contained in §141.85 of the regulation. Section 1 of this guidance document details these requirements.

This guidance document presents practical steps and helpful tips for large and small systems to understand their PE requirements under the LCR and to design and implement a community-based education program on lead and drinking water that reaches all segments of the population. This guidance document provides comprehensive information and includes required and suggested activities for conducting a successful PE effort. Water systems should pay particular attention to Section 1 for the specific PE requirements in the event of an exceedance. Keep in mind, water systems may already have in place a communications team or infrastructure that your PE program efforts can build upon. The key to reducing the health risks associated with lead in drinking water is communicating these risks with those who most need to hear this information and in the manner in which they are used to receiving information. A good PE program equals good risk communication.

Section 1

PE Requirements/Developing Your PE Program Plan

Conducting an effective Public Education (PE) program is essential if your system experiences a lead action level exceedance. The Lead and Copper Rule (LCR) requires specific actions in the event of an exceedance to inform the affected community about the risks associated with elevated lead levels (particularly to children and expectant or nursing mothers), to provide information on what the water system is doing to address lead in drinking water, and to advise the community on actions individuals can take to reduce their chance of exposure to elevated levels of lead in drinking water.

This section details the specific PE requirements under the LCR and presents basic steps in developing a PE Program Plan. Sections 2 and 3 go into a greater level of detail on each step in the Program Plan and strategies for implementing each step. Water systems, both large and small, should pay particular attention to the requirements outlined in Section 1 in order to meet your obligations under the LCR. (*Appendix D* of this document provides a copy of the Federal regulatory language described in this document.)

Summary of Program Requirements

This document provides guidance to you, the public water supplier, regarding the PE requirements of the LCR, as amended in 2007. Section 141.85 of the lead and copper rule regulations contain specific requirements regarding the content and delivery of your public education program. The tables below highlight the changes to the PE requirements contained in §141.85 and other public information requirements. Refer to pages 5-7 of this Section for complete program requirements.

Note: Water systems must submit all written public education materials to the state prior to delivery. The state may require the system to obtain approval of the content of written PE materials prior to delivery.

Table 1. Changes in the Public Education Requirements Resulting from the Lead and Copper Rule Short-term Revisions and Clarifications	
Revisions:	**Applies to:**
Content of Materials	
Must alter language of previous public education according to the new text.	All water systems
May use own language to discuss sources of lead and steps to reduce lead in drinking water (previously pre-written text was required. Systems are now able to develop own text within the guidelines that is applicable to local situation).	All water systems
Must include language explaining what happened and what is being done.	All water systems
Must include language providing contacts for more information.	All water systems
Must include language explaining how to get water tested and lead in plumbing components (low lead vs. lead free).	CWSs
Delivery of Public Education Materials	
Must deliver printed materials meeting the content requirements to all bill paying customers within 60 days after the end of the monitoring period in which the exceedance occurred.	CWSs

Table 1. Changes in the Public Education Requirements Resulting from the Lead and Copper Rule Short-term Revisions and Clarifications - (continued)

Revisions:	Applies to:
Must, no less than quarterly, provide information on or in each water bill as long as the system exceeds the action level for lead after the end of the monitoring period in which the exceedance occurred.[1] The message on the water bill must include the following statement: "[Insert name of water system] found high levels of lead in drinking water in some homes. Lead can cause serious health problems. For more information please call [insert name of water system] or visit [insert your Web site here.]	CWSs
Must continue to include information in water utility bill every billing cycle, but no less frequently than quarterly, while still in exceedance of lead action level.	CWSs
Must make a good-faith effort within 60 days after the end of the monitoring period in which the exceedance occurred to contact customers most at risk by delivering materials to the contact list of organizations with an informational notice encouraging them to pass the information along.	CWSs
Must deliver materials that meet content requirements to local public health agency and directly contact the agencies within 60 days after the end of the monitoring period in which the exceedance occurred.	CWSs
Must deliver materials that meet content requirements to: - Public and private schools or school boards - Women Infants and Children (WIC) and Head Start programs - Public and private hospitals and medical clinics - Pediatricians - Family planning clinics - Local welfare agencies	CWSs
Must post material to a publicly accessible Web site within 60 days after the end of the monitoring period in which the exceedance occurred.	CWSs serving a population greater than 100,000
Must submit press release to newspaper, television, and radio stations within 60 days after the end of the monitoring period in which the exceedance occurred.	CWSs
Must repeat submission of press releases twice every 12 months while still in exceedance of lead action level.	CWSs
Must implement additional activities from one or more of the categories listed within 60 days after the end of the period in which the exceedance occurred (See Tables 2 and 3).	CWSs
May distribute notices to every household served by system in place of submitting a press release.	CWSs serving 3,300 or fewer people (previously for CWSs serving between 501 and 3,300 people)
May limit the distribution of PE materials to facilities and organizations served by the system most likely visited by pregnant women and children provided the system distributes the PE materials to every household served by the system.	CWSs serving 3,300 or fewer people
Must repeat delivering printed materials, good-faith efforts, and outreach activities every 12 months while still in exceedance of lead action level.	CWSs
May receive extension from State on 60 day requirement if needed for implementation purposes.[2]	CWSs
End of the monitoring period is September 30 of the calendar year in which sampling occurs, or, if the Primacy Agency has established an alternate monitoring period, the last day of that period.	All water systems that are required to conduct monitoring annually or less frequently

[1]The message or delivery mechanism can be modified in consultation with the Primacy Agency. Specifically, the Primacy Agency may allow a separate mailing of PE materials to customers if the water system cannot place information on the water bills.

[2]Note: This extension is only appropriate if the system has initiated public education activities prior to the end of the 60-day deadline.

Table 1A. Other Lead and Copper Rule Public Information Requirements	
Revisions:	**Applies to:**
Notification of Results – Reporting Requirements[1]	
Must provide a consumer notice of lead tap water monitoring results to all persons served by sampling sites.[2]	All water systems
Must provide consumer notice as soon as practical, but no later than 30 days after system learns of tap monitoring results.	All water systems
Must include the following information: results of lead tap water monitoring, an explanation of the health effects of lead, list steps consumers can take to reduce exposure to lead in drinking water, and contact information for the water utility. The notice must also provide the maximum contaminant level goal (MCLG) and the action level (AL) for lead and definitions for these two terms.[3]	All water systems
Must be provided to all persons served at the site by mail or other methods. This includes those who do not receive a water bill.	All water systems
Consumer Confidence Report (CCR) Requirements[4]	
Every report must include the following lead-specific information: If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. [NAME OF UTILITY] is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking[5]. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.[6,7]	All CWSs
A system may write its own statement in consultation with the Primacy Agency.	All CWSs

[1]See *Appendix C* for templates with language that meets the notification of results requirements.
[2]This must be done whether or not you have a lead action level exceedence.
[3]The MCLG is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. The action level (AL) is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
[4]This information must be included in the CCR whether or not the CWS has had a lead action level exceedence.
[5]You may wish to, in consultation with the Primacy Agency, write your own flushing time based on the actual flushing time in your PE plan or a flushing time that is more appropriate to your system.
[6]For CWSs that have a lead action level exceedence, the new required language is in addition to what the system is required to report in the CCR. Note: All CWSs must report the number of samples above the action level and the 90th percentile value.
[7]CWSs in States where EPA is the Primacy Agency or that have adopted the Revisions by December 2008 must begin including this lead informational statement in CCRs that are due to consumers by July 1, 2009 (i.e., the 2008 CCR.) Otherwise, CWSs must begin to include this information in the 2009 CCR.

I. Required Content of Public Education Materials

Your PE notices are **required** to begin with the following statement:

> **Important Information about Lead in Your Drinking Water**
> *[Insert name of water system] found elevated levels of lead in drinking water in some homes/buildings. Lead can cause serious health problems, especially for pregnant women and young children. Please read this information closely to see what you can do to reduce lead in your drinking water.*

In addition to this statement, your PE notices are required to include, and in the order presented, the **topics which are listed below in bold** and the mandatory language which is noted below in *italics*. Additional information under the topics must be addressed in your PE materials, however, the specific content and wording is flexible. (*Appendix B* contains a template for a PE notice with the required content as well as suggested EPA language. Additional information for developing statements may be found at EPA's Lead Web site at www.epa.gov/lead).

- **Health Effects of Lead**

Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

- **Sources of Lead**
  - What is lead?
  - Where does the lead in drinking water come from? Include information on home/building plumbing materials and service lines that may contain lead.
  - What are other important sources of lead in addition to drinking water? (e.g., paint)

- **Steps you can take to reduce your exposure to lead in your water**
  - You must encourage running water to flush out the lead.[1]
  - You must explain concerns with using hot water and specifically caution against the use of hot water for baby formula (because lead dissolves more easily in hot water).
  - You must tell customers that boiling water does not reduce lead levels.
  - You must discuss other options customers can take to reduce exposure to lead in drinking water, such as alternative sources or treatment of water.
  - You must suggest that parents have their child's blood tested for lead.
  - You must tell customers how to get their water tested.
  - You must discuss lead in plumbing components and the difference between low lead and lead free.

[1] Consider conducting a study to determine the appropriate system specific flushing time. Consult with the Primacy Agency before designing or beginning a study. For example, a study may consist of collecting tap samples at different flushing time durations from a statistically significant number of taps. In addition, use a sample size that is different than the sample size used for the 90th percent calculation to avoid study samples from being included in the 90th percent calculation.

- **What happened? What is being done?**
  - Why are there high levels of lead in my drinking water (if known)?
  - What are you (the water system) doing to reduce the lead levels in homes in this area?
  - Does your system have lead service lines? How can a consumer find out if their home has one? Is there a program to replace it? Are there any special incentives offered?
  - Your system may also want to provide information on the history of lead levels in tap samples: have they declined substantially over time? Have they been low and risen recently? Is there a known reason for any change?

- **For more information**

Call us at [Insert Number] or (if applicable) *visit our Web site at* [Insert Web site Here]. *For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's Web site at* ***www.epa.gov/lead****, or contact your health care provider.*

- We recommend you include the name of your system and the date that the information is being distributed, along with the state water system ID, somewhere on the notice.

II. Required Delivery Methods for Your Public Education Materials

Tables 2 and 3 provide a summary of the required PE activities and the timing of their implementation, depending on system size. (*Appendix B* contains templates for all of the types of required notices and the required content).

Table 2. Required Methods of Delivery for Small (<3,300 customers) Community Water Systems

Requirement	Timing[1]
Deliver printed materials (pamphlets, brochures, posters) along with an informational statement encouraging distribution to all potentially affected customers or users	Within 60 days after the end of the monitoring period in which the exceedance occurred and repeating once every 12 months
Deliver public education materials to the following facilities and organizations that are served by the system along with an informational notice that encourages distribution to potentially affected customers:[2] 1. Local public health agencies[3] 2. Public and private schools or school boards 3. Women Infants and Children (WIC) and Head Start programs 4. Public and private hospitals and medical clinics 5. Pediatricians 6. Family planning clinics 7. Local welfare agencies	Within 60 days after the end of the monitoring period in which the exceedance occurred and repeating once every 12 months

Table 2. Required Methods of Delivery for Small (<3,300 customers) Community Water Systems *(Continued)*

Requirement	Timing[1]
Make a good faith effort to locate the following organizations within the service area and deliver materials that meet the content requirements, along with an informational notice that encourages distribution to all potentially affected customers or users. The good faith effort to contact at-risk customers may include requesting a specific contact list of the organizations from the local public health agencies, even if the agencies are not located within the water system service area:[4] 1. Licensed childcare centers 2. Public and private preschools 3. Obstetricians-Gynecologists and Midwives	Within 60 days after the end of the monitoring period in which the exceedance occurred and CWSs must submit a press release twice every 12 months on a schedule agreed upon with the Primacy Agency
Provide information on or in each water bill (no less than quarterly or state can approve a separate mailing)[5,6]	Each billing cycle for as long as the system exceeds the lead action level
Submit press release to newspaper, television, and radio stations[7]	Within 60 days after the end of the monitoring period in which the exceedance occurred and CWSs must submit a press release twice every 12 months on a schedule agreed upon with the Primacy Agency
Implement additional Public Education activities[8]	Within 60 days after the end of the monitoring period in which the exceedance occurred and repeating once every 12 months

[1] Primacy Agency can allow activities to extend beyond the 60-day requirement if needed for implementation purposes; however, this extension must be approved in writing in advance of the 60-day deadline.

[2] To obtain a list of organizations in your area, contact your local public health agency. Additional informational resources of associations and licensing agencies of these organizations are listed in *Appendix C*.

[3] Systems are required to contact their Local Public Health Agencies directly (either in person or by phone) even if they are not located in the water system service area. If you do not have a Local Public Health Agency, you should contact your State Health Department.

[4] For further clarification of a good faith effort, systems should consult with their Primacy Agency.

[5] State may allow a separate mailing if the water system cannot place information on the water bill. Water bill language is included in *Appendix B*.

[6] Systems may add additional pages (e.g., public education brochure) to the Consumer Confidence Report if timing is appropriate. However, it may be rare that timing will coincide, given that the CCR must contain compliance data collected in the previous calendar year and the report must be provided to consumers no later than July 1 (i.e., the report issued by July 1, 2007 contains compliance data collected in calendar year 2006).

[7] Primacy Agency may waive this requirement as long as the system distributes notices to every household served by the system.

[8] See Table 4 for a listing of the additional required activities for small systems.

Table 3. Required Methods of Delivery for Large (>3,300 customers) Community Water Systems

Requirement	Timing[1]
Deliver printed materials (pamphlets, brochures, posters) to all bill paying customers	Within 60 days after the end of the monitoring period in which the exceedance occurred and repeating once every 12 months
Deliver public education materials to the following organizations that are served by the system, along with an informational notice encouraging distribution to all potentially affected customers:[2] 1. Local public health agencies[3] 2. Public and private schools or school boards 3. Women Infants and Children (WIC) and Head Start programs 4. Public and private hospitals and medical clinics 5. Pediatricians 6. Family planning clinics 7. Local welfare agencies	Within 60 days after the end of the monitoring period in which the exceedance occurred and repeating once every 12 months
Make a good faith effort to locate the following organizations within the service area and deliver materials that meet the content requirements, along with an informational notice that encourages distribution to all potentially affected customers or users. The good faith effort to contact at-risk customers may include requesting a specific contact list of the organizations from the local public health agencies, even if the agencies are not located within the water system service area:[4] 1. Licensed childcare centers 2. Public and private pre-schools 3. Obstetricians-Gynecologists and Midwives	Within 60 days after the end of the monitoring period in which the exceedance occurred and repeating once every 12 months
Provide information on or in each water bill (no less than quarterly or state can approve a separate mailing)[5,6]	Each billing cycle for as long as the system exceeds the lead action level
Post material on the water system's Web site (for systems serving >100,000 individuals) or on a publicly accessible Web site (e.g. State Web site)	Within 60 days after the end of the monitoring period in which the exceedance occurred and continuously throughout the exceedance
Submit press release to newspaper, television, and radio stations	Within 60 days after the end of the monitoring period in which the exceedance occurred and CWSs must submit a press release twice every 12 months on a schedule agreed upon with the Primacy Agency
Implement additional Public Education activities[7]	Within 60 days after the end of the monitoring period in which the exceedance occurred and repeating once every 12 months

[1] Primacy Agency can allow activities to extend beyond the 60-day requirement if needed for implementation purposes; however, this extension must be approved in writing in advance of the 60-day deadline.
[2] To obtain a list of organizations in your area, contact your local public health agency. Additional informational resources of associations and licensing agencies of these organizations are listed in *Appendix C*.
[3] Systems are required to contact their Local Public Health Agencies directly (either in person or by phone).
[4] For further clarification of a good faith effort, systems should consult with their Primacy Agency.
[5] Primacy Agency may allow a separate mailing if the water system cannot place information on the water bill. See *Appendix B* for the required water bill language.
[6] Systems may add additional pages (e.g., public education brochure) to the Consumer Confidence Report if timing is appropriate. However, it may be rare that timing will coincide, given that the CCR must contain compliance data collected in the previous calendar year and the report must be provided to consumers no later than July 1 (i.e., the report issued by July 1, 2007 contains compliance data collected in calendar year 2006).
[7] See Table 4 for a listing of the additional required activities for large systems.

In addition to the activities described previously that are required for all community water systems, there are requirements that affect water systems depending on their size. Small systems (serving <3,300 individuals) are required to conduct one (1) additional activity listed in Table 4. Large systems (serving >3,300 individuals) are required to conduct three (3) activities from one, two, or three of the general categories listed in Table 4. Systems should verify with their Primacy Agency* to ensure fulfillment of all requirements.

Table 4. Required Methods of Delivery for Community Water Systems to Choose From[1,2]

Categories	Example Activities
Public Service Announcements	Radio and Television PSAs
Paid Advertisements	Newspaper, transit, or movie theater ads
Display Information in Public Areas	Community and health centers Local sporting events Grocery stores Laundromat bulletin boards Libraries Faith-based organizations Community listservs Utility or other publicly accessible Web site (for small systems serving < 3,300)[3] Post on local government Web sites
Email to Customers	
Public Meetings	Town hall meetings PTA meetings
Delivery to Every Household	Doorknob hangers, mailing to all consumers
Individual Contact with Customers (targeted contact)	Phone trees Calls to individual consumers/households Targeted mailings to at-risk populations
Provide Materials Directly to Multi-family Housing	Posters, flyers
Other Methods Approved by the State	

[1] *Appendix B* contains customizable templates for PE materials that may be used to meet these requirements.
[2] Consult with the Primacy Agency about what constitutes a good faith effort and what activities would work for your community.
[3] Large Systems must conduct this activity (see Table 3).

*In general, the term "State" is used to mean the Primacy Agency. Section 141.2 definition of "State" is the agency of the State or Tribal government which has jurisdiction over public water systems. During any period when a State or Tribal government does not have primary enforcement responsibility pursuant to section 141.3 of the Act, the term "State" means the Regional Administrator, U.S. Environmental Protection Agency.

III. Consumer Confidence Report Required Information[1]

In addition to the required PE activities above, all CWSs must include a statement about lead, health effects language, and ways to reduce exposure in every CCR released to the public. For CWSs that have a lead action level exceedance, the new required language (see below) is in addition to what a system is required to report in the CCR. Note: All CWSs must report the number of samples above the action level and the 90th percentile value.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. [Name of utility] is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your drinking water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available form the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

Flexibility is given to CWSs to write its own informational statement, but only in consultation with the Primacy Agency. For example, the system may wish to revise the flushing time of "30 seconds to 2 minutes" if it conflicts with the flushing information in its public education materials or to add the phone number for the Safe Drinking Water Hotline (1-800-426-4791). CWSs in States where EPA is the Primacy Agency or that have adopted the Revisions by December 2008 must begin including this lead informational statement in CCRs that are due to consumers by July 1, 2009 (i.e., the 2008 CCR). Otherwise, CWSs must begin to include this information in the 2009 CCR. **Please note**, this new requirement applies to **all** CWSs irrespective of whether they have had a lead action level exceedence.

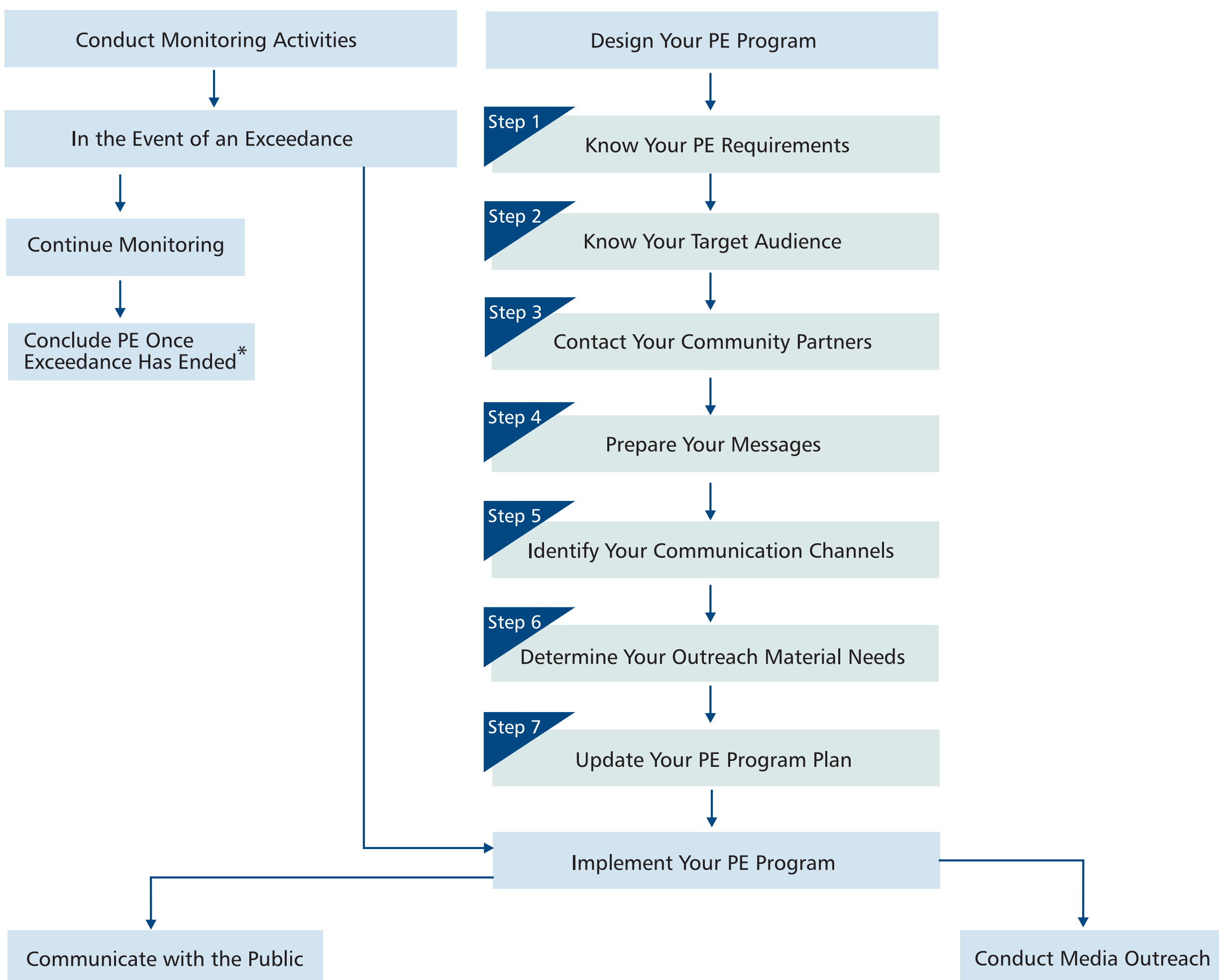
[1] Refer to *Appendix B* for sample Consumer Notification templates.

IV. Developing Your Public Education Program Plan

Meeting the requirements outlined above will require a good deal of effort on the part of a water system to implement the required activities, and within the required timeframe. The most effective way to implement these requirements it to develop a PE Program Plan in advance of an exceedance. This plan will help you determine what activities you will want to undertake during your routine monitoring and what you will need to do to implement your required PE activities in the event of an exceedance.

The flowchart below lists seven recommended steps for designing and implementing your PE Program Plan. Each step corresponds to a more detailed description included in Sections 2 and 3 of this guidance document. Page 26 includes a simple checklist of actions you may wish to conduct as you design and execute your PE Program Plan.

Public Education Flow Chart



*Note: A water system may discontinue delivery of public education materials when the system has met the lead action level during the most recent six month monitoring period.

- **Step 1: Know Your PE Requirements**
  Refer to pages 8-12 of this Section to review the required content and delivery mechanisms for your PE program.

- **Step 2: Know Your Target Audience**
  Knowing who is in your target audience is an important first step. This will help guide your efforts to craft messages and materials, develop effective partnerships, and determine how (and through whom) to deliver these message and materials for maximum impact. (See Pages 17-18 to learn more about identifying your target audiences).

- **Step 3: Contact Your Community Partners**
  Once you know your requirements and who you will be contacting, develop partnerships with key members of your community who will help you distribute your messages and materials and who serve as an information source in your community (e.g. local health department). You should educate these partners about your PE requirements and PE program, ask them for advice on how to reach your target audiences, and let them know what assistance they can provide, such as quickly reaching the community and providing input in planning your PE program. **Please note that systems are required under the LCR to make direct contact with their local health departments.** (See Pages 18-21 to learn more about identifying and working with your community partners). *Appendix C* contains additional information for contacting local community partners.

- **Step 4: Prepare Your Messages**
  After identifying your audience and resources and talking with your community partners, you should identify the messages and most effective activities and delivery methods to reach your audiences. Pages 8-10 provide specific information on the delivery methods you are required to conduct. Consider the education level of your audience and use the templates in *Appendix B* to customize your PE materials (and keep in mind the required content detailed on Pages 8-9). Preparing templates ahead of time will help make compliance within the standard timelines more feasible. (See Page 21 to learn more about preparing your messages).

- **Step 5: Identify Your Communication Channels**
  Knowing what messages and delivery methods you will likely be targeting, you can contact the appropriate channels to prepare for implementation. This should include developing a list of media outlets and contacts for distributing press releases, documenting posting requirements for Web sites, and determining contact information for placing advertisements or submitting public service announcements. Work with the community partners you established in Step 3 to enlist their assistance in reaching high-risk groups, specific ethic or cultural groups, or other target audiences. (See Pages 22-23 to learn more about communication channels). *Appendix C* contains additional information for identifying communication channels.

- **Step 6: Determine Your Outreach Material Needs**
  Identify what materials you will need and what processes you will need to put in place to produce them quickly. You should determine how many copies of materials you will need, the costs for producing materials, the amount of time printers will need to produce materials, and contact information for printers, web designers, and others who will assist you in materials preparation. (See Pages 23-24 to learn more about planning your outreach material needs).

- **Step 7: Update Your PE Program Plan**
  Periodically, you should review and update your PE Program Plan. This should include updating all contacts, talking with your community partners to confirm their willingness and ability to assist you in the event of an exceedance, and determining if any new methods or ideas for reaching your target audiences are available to you. All resources and prices associated with creating and producing your PE outreach materials should also be checked and updated.

Section 2

Designing an Effective Public Education Program

This section describes the recommended steps you should consider in planning your public education (PE) program. These steps can help you design your PE program to ensure that, should your system experience an action level exceedance, you will be ready to implement PE activities quickly and effectively. Your PE Program Plan should be part of your system's larger communications plan (i.e. incorporate with your public notifications, boiling water advisories, communication planning, etc.) While the PE requirements vary somewhat by system size, the steps and tips presented below are applicable to all water systems, large and small.

This section is organized around the following key steps:

- **Step 1: Know Your PE Requirements**
- **Step 2: Know Your Audience**
- **Step 3: Contact Your Community Partners**
- **Step 4: Prepare Your Messages**
- **Step 5: Identify Your Communication Channels**
- **Step 6: Determine Your Outreach Material Needs**
- **Step 7: Update Your PE Program Plan**

Creating an effective PE program requires careful planning and timely execution. Increasingly, the public expects service providers to share health risk information in a timely and effective way. Prompt and thorough communication allows the public to understand a health risk issue and take action to minimize their personal risk until the issue is resolved. Risk information should be clear, thoughtful, and should be delivered in a manner that meets the needs of all members of your community. Waiting until a lead action level exceedance has occurred to plan your program and materials creates an unnecessary burden on your system and may result in rushed and less effective communications with your community.

TIP: An effective PE Program equals effective risk communication

There are several guidelines for effective risk communication that should be considered when designing a PE campaign.

- Take the initiative in providing information to your community.
- Plan your efforts in advance and evaluate them upon completion.
- Listen to your community members and acknowledge their concerns.
- Be a reliable source of information. Provide honest, accurate, and comprehensive information.
- Partner with trusted sources in your community.
- Provide timely and accurate information to the media.
- Always speak with a consistent voice. Designate one point of contact that can respond to the public and the media.
- Make PE materials easy to read and understand for people with differing educational levels.

Step 1: Know Your PE Requirements

Section 1 of this guidance document outlined the required activities, content, and delivery mechanisms water systems must implement in the event of a lead action level exceedance. Water systems are required to communicate with their Primacy Agency when an exceedance is identified. As part of your planning, you should identify the contact at the Primacy Agency for consultations on PE requirements. Review pages 5-13 to understand your PE requirements and see *Appendix D* for the Federal regulatory language.

Step 2: Know Your Audience

Once you have reviewed your PE program requirements, the next step is to determine the audience(s) for your PE program activities.

Identifying your key audiences and their information needs is, perhaps, the most important step that you can take when planning your program. The size, location, and cultural composition of your audiences will have a direct effect on the design of your program — from the educational materials you use to how you distribute information. Effective risk communication requires that important messages reach those who need to hear them when they are ready to hear them and in a way they can understand. In some cases, effectiveness is determined by the person communicating the message (i.e., using health care providers to educate expectant mothers) while in other cases, effectiveness is determined by the way the information is presented (i.e. through direct mailings, mass media, etc.). Whatever the case, understanding your audience and their needs is essential for determining how and where to deliver information that educates, promotes desired behaviors and actions, and creates confidence in your system's ability to deal with an exceedance.

TIP: Research your audience in advance to understand any unique requirements they may have.

- What languages are spoken in your service area?
- Within each language community, what percentage of people is also proficient in English?
- Are there large numbers of people in your service area with low literacy levels?
- Are low-literacy groups "clustered" in certain zip codes or neighborhoods?
- What sources of information do these groups trust?

Below are some of the audience segments that you must reach out to when conducting your PE Program.

- **General public.** This includes everyone in your service area that may be affected by an action level exceedance.
- **High-risk Groups.** Those particularly vulnerable to lead in drinking water exposure include children 6 years of age and younger, infants, and pregnant women. Your PE program should target agencies and organizations that serve high-risk groups, deliver materials and messages that make the risks clear, and provide actionable recommendations for how to protect oneself and ones children from the risks of lead in drinking water.
- **Different Language Communities.** If significant proportions of the population in your community speak languages other than English, the PE materials must contain information in the appropriate language(s) regarding the importance of the notice or a contact where persons can obtain a translation or assistance.
- **Low-literacy Audiences.** Some individuals in your community may possess limited reading skills. To reach these individuals, print materials must be written as simply and concisely as possible and should contain graphical representations of key messages and actions. Low-literacy groups are more likely to rely on non-print forms of communication, such as TV or radio Public Service Announcements (PSAs), to receive information about critical health topics.
- **Non-bill Paying Customers.** Some people who drink your system's water may not receive a water bill (e.g., commuters working within the water system area, but living outside of it; residents in multi-unit dwellings who may not pay for water; restaurant owners who use the water for cooking, etc.) and your system needs to establish delivery mechanisms to reach these individuals.

Sources of information about your audiences:

U.S. Census Bureau

To find information on the languages spoken in your area, see the U.S. Census Bureau's Web site, http://factfinder.census.gov. The census database includes information about literacy levels, what languages besides English are spoken at home, and the level of English proficiency. (English proficiency is important, because if a group tends to speak a language at home, but is also able to read and understand English, a notification in a second language may not be necessary.) You should also be able to find out the number of people who speak each language.

Local Media

Your local media is a good source of information about your community. It is the media's job to know the community inside and out. Media outlets have an economic need to understand how to reach various segments of the audience and typically have a mission to serve the community. These two goals mean that they are likely to know the various audience segments in your community and have contacts with key leaders within the community who have strong relationships or access to a specific subgroup. Since you should establish relationships with your media anyway (Step 3), one way to create media allies is to recognize their knowledge and ask them for valuable information about your service population.

Community and Ethnic Group Leaders

Community and ethnic group leaders can help you understand the audience segments you serve and learn about the communication channels each segment uses and trusts. These grassroots groups have a high level of contact with target demographic groups and tend to be trusted by them. Establish and maintain working alliances with these grassroots organizations so that if you need to quickly disseminate a message about the drinking water in the future, you already have channels in place to reach your diverse audience. This can demonstrate your concern for the community they serve and establish a level of trust that will increase the likelihood that they will assist you when needed.

Cultural and ethnic interest groups, churches/ mosques/ synagogues, and multicultural centers are in touch with the needs and concerns of specific racial, religious, or ethnic groups, including people who may not speak or read English. Leaders of such groups may enjoy greater trust among their constituents than water system spokespeople.

Health Care Providers

Health care providers, hospital and nursing home directors, and social service providers are a first source of information for many people, especially vulnerable populations. Health professionals are likely to be asked questions when there is an issue related to the drinking water. Establishing relationships with these professionals in advance of an action level exceedance and providing them with information on your water system's plans when an exceedance occurs will help them educate their customers and allay their concerns. *Appendix C* contains more information on identifying these resources within your community.

TIP: As you explore the resources in your community and establish relationships with potential allies, remember to ask about the key local media that each audience segment looks to for information. For example, many communities have multiple non-English radio stations, cable access television shows, and local public radio stations that may appeal to your various audience segments.

Step 3: Contact Your Community Partners

Now that you understand your PE program requirements and know your audiences, you should assemble your communication or outreach team and establish community partnerships. You may already have a communications team or person(s) that can be utilized to implement the PE program. Water systems that seek assistance from a variety of community partners to inform PE efforts and to design PE programs are more successful at implementing effective PE campaigns than those that do not. A diverse team comprised of community members representing the public, private, and civic sectors can provide your water system with: access to a wide range of community resources; understanding of the community's audience segments and the best ways to reach them; and ready-made communication channels that you can access in the event of an exceedance.

These groups can make unique and important contributions to your PE program. Government officials lend credibility and authority and can draw attention to the program. Government agencies offer a variety of specialized services and technical expertise from mobilizing community resources and media involvement to providing expertise on the health effects of lead. Schools are one of the best conduits in any community for reaching parents of young children. Community service organizations can distribute information to high-risk targeted groups; civic groups can offer valuable volunteer assistance; and the private sector can underwrite program costs as well as distribute and explain information about lead in drinking water to high-risk targeted groups.

Suggested PE Community Partners (see *Appendix C* for more information)

- City, county, and State government officials including representatives of the city, county, or municipal council; the mayor's, city administrator's, or county commissioner's office
- City or county government agencies including the public affairs, health, and environmental protection departments, and local agencies responsible for lead screening programs
- Representatives of the local public school system
- Representatives of public hospitals and/or clinics
- Representatives of community organizations that the LCR requires water systems to reach out to in the event of an exceedance (see Page 9 for a list of these organizations)
- Members of civic groups such as the Chamber of Commerce, neighborhood associations, and local chapters of community service organizations
- Private sector leaders such as child care centers, health care providers, health care facilities or clinics, and hospitals

Form your planning team and meet with them regularly to help you take action on the remaining steps presented below.

In addition to the members of your communication or outreach team, consider creating partnerships with two important groups within your community: the public health community and the media. These groups are essential avenues for quickly reaching the public. Enlist their assistance in planning your PE program so that they will be ready to assist your efforts should you have an exceedance.

TIP: Because of their interactions with your target audiences, local health professionals need to understand how a lead action level exceedance affects their constituents and patients. Public health officials may know the most effective channels for reaching your community's health providers. Discuss this in advance so that you are not trying to find every child and maternal health clinic, doctor, and nurse in your community at the same time that you are trying to solve an exceedance problem.

Partnering with the public health community

Collaborating with public health officials is crucial to developing an effective PE effort. Different parts of the health department, including maternal and child health, community health, environmental health, and other sections, can assist in developing your materials and conducting effective outreach. Local public health agencies often know how to reach specific segments of your target audience because they may have had to conduct a similarly targeted outreach campaign before. Connecting your PE campaign effort to the health department's lead poisoning prevention, water quality, and broader environmental programs, can seed the kind of holistic lead education program that communities require. Lead in drinking water is one possible source of exposure, but there are many other sources and the public needs to think about lead health risks from every source, not just what could be in the water.

Remember that the public health community is a much larger group than just the local government agencies. Local universities, community based organizations, health care providers and insurers, nurse practitioners, and many others create the network of care that surrounds your community. You should try to access as many of these organizations as you can to determine the most effective communication channels and outreach tactics for your PE campaign. The more allies you have, the better. *Appendix C* contains additional information for identifying community partners.

Chances are that public health officials who regularly work on lead issues already have lists of contacts of health care providers, schools, child care organizations, and social service providers with close ties to women, infants, and children in your community. Learn from what they already know. Explain your role in monitoring for and communicating about lead and educate health officials and others about how lead enters drinking water, how the water system monitors for it, and steps one can take to minimize lead exposure.

Develop a relationship and response plan with your local health department so that you have an agreed upon process for sharing information about lead in drinking water risks and communicating with the public. Consumers may call the health department for information about the health risks described in your PE materials; if you coordinate in advance, you can ensure that, regardless of who they call, your public hears consistent messages that will help them understand the risks and how to manage them. The latest LCR revisions require that water systems must have direct contact with public health officials in the event of an exceedance. Establishing and maintaining relationships with these individuals as you plan your program will make it easier to work with these individuals in the event of an exceedance.

TIP: Be on the lookout for opportunities to help your local media learn about the services your system provides and to recruit them as allies in your PE efforts. One successful approach is to host an annual media day where you can offer tours, explain how your system operates, and explain your lead monitoring program. The more informed your local media is about your water system, the more accurate and positive they will be when covering an exceedance and conveying information to your public.

Partnering with the media

Your local media (print, radio, and television) can be a powerful ally in planning and executing your PE program. More than any other communication channel, the media can rapidly reach a large number of people with educational messages. Although working with the media may be challenging at times, planning ahead will help you to quickly and effectively engage them should you have an exceedance. (See Section 3 for information on working with the media during an exceedance).

Designate one person on your staff to serve as a liaison to the media. Media outlets will need to know who they can speak to about an exceedance and any ramifications for the public. In the event of an exceedance, all media inquiries should be directed to the media spokesperson. This will ensure that messages coming from your water system are consistent and contain accurate information. As part of your system's community relations efforts, your spokesperson should meet regularly with local editors or station managers for both small and large media outlets. You should identify and meet with reporters or segment producers that deal with environment, health, and water issues to educate them about the water system, why and how you monitor the water quality, and what your program will do if a lead action level exceedance or other kind of violation occurs. The more information you can provide up front, the less likely the media will be to make errors in their coverage.

Ask your media contacts what kind of information about water quality issues they would find valuable in case of an exceedance and prepare draft materials for the media in advance. If you make it easy for the media to cover your story correctly, they are more likely to do so. If you base your draft media materials on input from the media themselves, when it is time to finalize your materials and distribute them as part of your PE campaign, the media is more likely to help you get your message out and to reinforce your messages.

Finally, as part of your planning for media engagement, identify individuals in your community (e.g. public health officials, scientists, experts from local universities, etc.) who can serve as experts for the media to contact. These individuals should be very familiar with issues related to lead in drinking water—preferably they are members of your team who you have educated thoroughly about your lead monitoring program and who know your commitment to safeguarding the public health, steps individual customers can take to protect against lead health risks, your PE Program Plan, and your plan for solving the problem.

Effective messages should:

- Be clear and concise.
- Be compelling, encourage action, and explain how to take action.
- Communicate the risks from all sources of lead with a particular emphasis on drinking water.
- Meet the communication needs of your entire community (See Step 2).

Step 4: Prepare Your Messages

Now that you have identified your target audiences and determined what specific communication needs they might have, the next step is to prepare your PE messages. For drinking water-related issues, the public is most likely to be interested in:

- Health and safety implications. (Is my family's health in danger?)
- Simple advice and guidance. (What should I do to stay safe?)
- Practical implications, such as potential service interruptions. (How will this affect my daily life?)

You do not have to wait for an exceedance to begin preparing your messages. The required PE language (as detailed in Section 1) considers the public's risk communication needs, but your system will want to customize your communications to convey actions you are taking as a system to address the exceedance. Developing your key messages and identifying materials to distribute to the public (Step 5) will ensure that, should an exceedance occur, you will be ready to deliver materials that educate your public, empower people to take action to protect their health, and build trust between you and your community.

TIP: Effective risk communication requires that any member of the affected public should know who to contact for more information and how they can learn more about lead in drinking water and lead health risks.

When you think about preparing messages, consider that doing so also allows you to train spokespersons, build Web pages, draft press releases, and create fact sheets, brochures, and other required materials before you ever have to deal with an exceedance. **Keep in mind that Section 1 contains information about the messages your PE materials are required to contain.**

Step 5: Identify Communication Channels to Get Your Message Out

The next step after determining what messages you will use in your PE Program is to identify what mechanisms you will use to get your messages out to your target audiences.

As part of your PE program, water systems that have lead action level exceedances are **required** to reach out to organizations that regularly interact with young children, infants, and pregnant women (See Section 1). This requirement is designed to help water systems find communication channels, or conduit organizations, through which they can distribute materials and educational messages to ensure that critical information reaches the most vulnerable populations as quickly as possible. You should assemble a list of organizations, contacts, and distribution plans to ensure that, when you need to implement your PE campaign, the pathways for sharing your information and reinforcing your messages are already in place.

Many of the organizations that may serve as communication channels should already be on your PE team. Those organizations that may play a role in the event of an exceedance and who are not on your team will need some specific information from you as you are establishing the relationship. Make sure all of the partners you expect to work with know:

- What to expect if an action level exceedance occurs.
- What to do with the materials that you provide them.
- How to reach the key person(s) responsible for your drinking water PE program.

Remember: To reach vulnerable populations with information about lead, water systems are **required** to conduct targeted outreach to:

- Local public health agencies
- Public/private schools or school boards
- WIC/Head Start centers
- Public/private hospitals and clinics
- Pediatricians and pediatric nurse practitioners
- Family planning clinics
- Local welfare agencies

Water systems are required to make a good faith effort to conduct targeted outreach to:

- Licensed childcare centers
- Public and private pre-schools
- Obstetricians-Gynecologists and Midwives

Appendix C contains additional information on how to locate these organizations

Tips for Planning Your Messages and Outreach

Identify Key Organizations. Identify those organizations in your community that meet the required and recommended list of organizations.

Assemble Your List and Be Ready for Action. Routinely review and update as necessary your list of target organizations. Include the name of a contact person at each school, hospital, clinic, child care provider, social service, or other organization through which you plan to distribute your PE materials. Make sure you have the address, phone number, email, and any contact information you need to quickly reach these organizations.

Assemble a spreadsheet or database to manage organizational contact information. In addition to managing the contact information for your conduit organizations and community partners, you may also want to include the name of the target population you expect that organization to help you reach. Having such a system can prove useful if you have an exceedance: you can use it to print mailing labels; organize a phone tree; and track your efforts to reach vulnerable populations, various language communities, and non-bill paying customers.

Learn from the Professionals and Recruit Advocates. Meet with your local health department officials and ask them about the most effective means of communicating to target populations in your community (see Step 3).

Educate and Learn from Your Advocates. Explain why lead is something you monitor, how you monitor, what you are required to do in the event an exceedance, how they can help you and why they should care to help you, what they can expect to receive from you in the event of an exceedance, and what you would like them to do. Ask them what they have found to be effective methods for sharing health risk information with your target audiences.

In addition to the organizations you are **required** to conduct outreach to, EPA strongly recommends that water systems also contact:

- Maternity programs/birthing classes
- Teen parent programs
- Parent teacher organizations
- Parent support organizations
- Women's shelters
- Family/general practices and nurse practitioners
- Institutes of higher education
- Local non profit health groups

In addition to these organizations that have access to high-risk populations, EPA recommends reaching out to conduit organizations that can help you to reach non-bill paying and other target audiences including:

- Citizen's assistance offices to request that they place your materials in their lobbies or waiting rooms;
- Health insurers who can include your messages in their regular communications to their provider network and members;
- Outlets that accept government payment for goods and services, such as supermarkets that take food stamps or WIC coupons;
- Low income/HUD housing where you can place posters; and
- Non-profit organizations, such as soup kitchens, religious organizations, and others, that provide services to people who may not receive a water bill.

TIP: While systems serving over 100,000 customers are **required** to provide information on their system or other publicly accessible Web site, systems of all sizes are encouraged to also utilize electronic dissemination where available.

You should also share key information and messages with all of your employees. Your system's employees are all ambassadors for the system as they go about doing their work. Keeping them well informed is critical, as they will get questions and should be prepared to address issues from your customers.

It is ideal to establish relationships and mechanisms for sharing information with such conduit organizations before an action level exceedance occurs. By coordinating with these groups, you can establish a ready-to-go plan for communication, build understanding of why information about lead in drinking water is important and why young children, infants, and pregnant women need to know about lead in drinking water, and prepare staff at these organizations to discuss lead health risks.

Step 6: Determine Your Outreach Material Needs

The next step you should take in designing your PE program is determining what materials you will provide and how you will make them available. As you are identifying how best to reach your target audiences, keep in mind any production processes that will need to occur between the time you finalize your materials and the time they are ready for distribution.

TIP: Systems should identify groups (e.g. schools or community organizations) that can translate PE materials for non-English consumers.

- Identify approximately how many copies of brochure, pamphlets, and posters you will need to print for quick distribution. Be sure to make extra copies of all materials should you need to distribute several mailings during the exceedance.
- Determine if your system has the capability, to quickly generate these materials and in the needed quantities.
- Consider financial needs and resources of outreach activities, (i.e. printing costs).

- Identify vendors in your community that can quickly reproduce the materials that you need and regularly check in with them to ensure that they can meet your needs.
- Negotiate an agreement with printers ahead of time so that you are not forced to negotiate your terms when you are under pressure to meet a deadline.
- Ask your community partners if they have the capability to assist you with preparation and production of materials.

TIP: When preparing your materials, keep in mind the variety of customers that you serve and their unique needs (Step 2). For example, your audience research will tell you if you have a large Hispanic population in your service area. You may learn from your partner organizations that many Hispanics in your community listen to specific radio stations, watch certain television programs, read particular periodicals, and convene at specific locations.

Assemble additional materials you may want to distribute with your PE materials, such as fact sheets and other supporting materials on the health effects of lead. These materials are available at no-cost from EPA's Safe Drinking Water Hotline at 1(800) 426-4791 or EPA's Web site at http://www.epa.gov/safewater/lead/index.html. In the event of an action level exceedance, you will already have the explanatory materials your consumers may ask for after receiving your notices. EPA's materials are updated periodically, so check the Web site regularly to make sure that you have the most recent versions. The Hotline also can provide phone numbers for state laboratory certification offices where consumers can get a list of labs certified to conduct lead testing.

Step 7: Update Your PE Program Plan

During the course of your monitoring activities (and if there is no exceedance), you should update your PE Program Plan periodically. Contact all of your community partners (if you have not done so on a regular basis) and determine if you have correct contact information. Update any material templates you have created (with any new information on corrosion control or other activities undertaken by your water system to control lead in drinking water). Contact all of the printers and vendors that you will use to produce your materials in the event of an exceedance. Update your local public health agencies and providers about your lead program and any activities you are taking to reduce lead and monitor drinking water supplies. Finally, contact your local media to update them on your efforts and to address any questions they may have about your systems' monitoring or corrosion control activities.

By keeping your plan updated and maintaining regular contact with your community partners and the media, you will ensure that, should you have an exceedance, you will have all of the mechanisms in place to quickly and effectively respond with your PE program.

Section 3

Implementing Your Public Education Program

A lead action level exceedance triggers the Lead and Copper Rule (LCR) requirements for Public Education (PE) and establishes a timeline for performing required activities. In most cases, your PE activities must be implemented within 60 days of the end of the monitoring period in which the exceedence occured. See Section 1 to review the specific requirements for PE if you have an exceedance.

Section 2 of this guidance document outlined the suggested steps you should take to design your PE program, prior to an exceedance. In this section, key activities for implementing your PE program are presented. These activities include:

- **Produce Your PE Materials**
- **Distribute Your PE Materials**
- **Conduct Media Outreach**
- **Communicate Directly with the Public**
- **Conclude Your PE Activities (at the End of the Exceedance)**

TIP: It is important to remember that education programs can only be effective when they are administered over time. Competing demands for people's attention—information overload—can be a significant impediment to understanding. Therefore, you should meet the initial PE requirements as soon as possible and pace your additional PE activities over several months to ensure that your public has multiple opportunities to receive your messages.

The checklist below provides the key activities your program will need to take in order to effectively implement the PE requirements and reach your key audiences. Refer to *Appendix B* for a checklist you can tear out and use as you complete your activities.

Checklist for Implementing Your PE Program

- ✓ Notify your Primacy Agency of an action level exceedance triggering your PE program.
- ✓ Notify your system's decision maker (owner or president) of the exceedance.
- ✓ Review your PE requirements (Section 1) and the timeline for delivering PE materials (see Tables 2 or 3 on Pages 8 or 9).
- ✓ Notify your communication or outreach team of the exceedance and enlist their assistance in implementing your plan.
- ✓ Inform all of your employees about your activities so that they can respond to customer questions or issues.
- ✓ Implement your phone tree and contact your conduit organizations to let them know that an exceedance has occurred and that you will be sending them materials for distribution.
- ✓ Update your PE material templates with information on the exceedance, actions you are taking to address it, and any other relevant information.
- ✓ Identify groups (e.g. schools and community organizations) that can translate PE materials for non-English consumers.
- ✓ Prepare mailing labels for conduit organizations and other dissemination mechanisms.
- ✓ Duplicate your pamphlets, flyers, posters, or other printed materials and prepare to deliver them to your customers and conduit organizations.
- ✓ Meet with representatives from your local health agency (in person or by phone) to alert them to the exceedance and provide them with materials they can distribute to the public.
- ✓ Send a press release to your local media outlets (print, TV, and radio).
- ✓ Reach out to your established media contacts and work with them to distribute your key messages.
- ✓ Coordinate with your spokesperson/spokespeople to conduct media interviews.
- ✓ Document your PE activities and report back to your Primacy Agency on completion of activities as required.
- ✓ Update your system's Web site (if applicable) to include PE materials and key messages for the public.
- ✓ Schedule and conduct public meetings as needed.
- ✓ Continue to conduct your monitoring activities as required.
- ✓ Notify the public when the action level exceedance has ended.

Produce Your PE Materials

A critical first step in implementing your PE program in the event of an exceedance is to produce the materials you have determined in your planning that you will need to distribute to your target audiences. The following information will help you finalize your materials in accordance with the LCR requirements and prepare them for quick delivery to your conduit organizations and your community.

Printed Materials

See Section 1 for a reminder of the LCR requirements for content for PE materials.

Appendix B provides template pamphlets with the mandatory language systems must provide to their customers. Note that electronic fill in the blank versions of these materials are available on the internet at www.epa.gov/safewater/lcrmr/compliancehelp.html for systems to update and customize the documents with their system-specific information.

Press Releases or Media Notices

Water systems are required to provide two press releases per year for the duration of the exceedance. (See Section 1).

Your press releases should be brief informational notices that are ready to be distributed to local press representatives. Always include the name and phone number of an informed contact so that media representatives can obtain more information and cover the issue more fully than presented in a news release. (A sample press release template is provided in *Appendix B*). When conducting your planning, ask your media contacts what would make a press release stand out to them and what they are most likely to publish so that you can plan ahead to secure media coverage in the event of an exceedance.

Tips for Creating PE Materials That Work

- **Place the most important information first.** Most readers only read the top half of printed materials and focus on large text such as headings and bolded text. The most important information, especially instructions to protect consumers' health, should be placed on the top half of the notice in large print. Smaller type is appropriate for less critical elements.
- **Limit wordiness.** A question and answer or heading and subheading format is easy to read and guides readers to the information that is likely to concern them. Risk communication studies have shown that when dealing with potential health risks, people become emotional and have difficulty processing information. The best way to help the public understand your messages is to communicate a limited number of messages and to strive for consistency of messaging across all communications media. If people hear your few, simple messages over and over again, they are more likely to accurately estimate their risks and to take the right steps to manage them.
- **Use graphics,** such as photographs or drawings, to illustrate your messages. Wherever possible, provide an image that describes the actions the public should take to protect themselves from potential health risks.
- **Highlight the name of your system,** especially where people in your area are served by more than one water system. You may also want to prepare a map showing the area you serve, especially if it extends beyond city limits. You may want to print materials on your system's letterhead which, coupled with the material's title, will help people recognize that it is important.

Material Templates

Appendix B contains templates for a variety of public education materials that your system can use to support your efforts. These templates include:

- Water Bill Insert Statement
- Brochure
- Poster
- Press Release
- Print Advertisement
- Listserv or Web site Announcement
- Public Service Announcement (text for a radio or television PSA
- Consumer Notice of Tap Water Results

Additional Materials

Table 5 contains a list of suggested materials that may be useful in conducting additional PE outreach activities.

Fact sheets - Provide basic, objective, detailed information on an issue or topic. Fact sheets can provide information about the problem, recommended consumer actions, health risks, actions being taken, and treatment goals. Fact sheets should be easily understood by the broadest spectrum of audiences.

Tip sheets and brochures – Outline specific actions residents should take. They should be clear, concise, and present the action steps in a simplified manner.

Talking points – Give water system representatives and expert spokespeople tips on communicating about the exceedance and the treatment process. The talking points highlight key messages that should be delivered to the target audience in a clear and effective manner.

Charts and illustrations – Visuals can help to convey complex messages that may be difficult to understand or to communicate textually. Examples include: the incidence of elevated lead levels in homes with and without lead service lines, and the relative numbers of homes in each category; and a "source to tap" representation of how water gets from the source to customers' taps.

Fliers – If you plan to host public meetings, fliers can be used to publicize upcoming meetings and other events. They should be translated into the most common languages spoken among the target audience.

Technical/medical materials – Doctors, nurses, clinic workers, and other health care professionals may prefer technical information about the potential health effects of lead in drinking water.

Deliver Your PE Materials

Once you have produced your PE materials, the next step is to deliver them through the various conduit organizations and communications channels that you identified in your program design (See Section 2, Step 6).

Table 5. Suggestions for Materials in Various Communications Venues

Materials	Communication Routes
Fact sheets	▸ Insert in media press kits ▸ Include in conduit organization mailings ▸ Hand out at public meetings
Tip sheets	▸ Include in conduit organization mailings ▸ Hand out at public meetings
Talking points	▸ Use for press events ▸ Use at public meeting presentations ▸ Provide to utility telephone receptionists or others taking calls from the public
Press releases	▸ Issue in advance of press events and public meetings
Charts and illustrations	▸ Provide as graphics to television stations and print media ▸ Display and distribute as handouts at public meetings ▸ Use in briefing slides or display as posters for press events and public meetings
Fliers	▸ Distribute in advance of public meetings
Public service materials	▸ Distribute PSAs to radio and television stations and print media ▸ Include in conduit organizations mailings ▸ Distribute at public meetings
Technical/ medical materials	▸ Distribute to community leaders and health care professionals

Bill Inserts

Many CWSs periodically enclose special information notices or inserts in their customers' water bills. If you already provide this service, you may choose to dedicate a particular notice to the topic of lead in drinking water. Bill inserts are relatively inexpensive to produce — especially if you already have a regular notice service. If you do not currently provide such a service, you can use the notice provided in *Appendix B*. Remember: in an exceedance you are required to provide lead information no less than quarterly on each water bill using the required language.

TIP: Remember that people who live in apartment complexes or other housing units where the water bill is paid by a landlord or a supervisor will not be on your mailing list. The landlord or supervisor for such buildings should be mailed extra bill inserts for distribution to residents.

Local Newspapers

CWSs must deliver information within 60 days after the end of the monitoring period in which the exceedance occurred and twice every 12 months on a schedule agreed upon with the Primacy Agency to editorial departments of the major daily and weekly newspapers circulated throughout the community. Newspapers are always in search of newsworthy items and will often publish feature articles based on a news release or coverage of a press conference. You should use all major daily and weekly newspapers to get your message delivered.

TIP: Under the LCR, small systems (serving 3,300 or fewer people) are no longer required to deliver PSAs. Check with your State Primacy Agency to be sure that you are exempt from this requirement.

Radio and Television Stations

Radio and television stations are a prime source of information for most people. Radio and television news programs often feature brief spots based on a press release or coverage of a press conference. The stations also broadcast brief PSAs as a community service. In addition, they feature news briefs, special interest features, and talk shows on local issues of interest. Large CWSs should promote radio and television coverage of lead in drinking water issues as an effective way to get the message delivered to a mass audience at no cost.

Public Service Announcements

Section 141.85(b) of the regulation does not specify the minimum content of the public education language to be broadcast to customers. A PSA can be broadcast on either radio or television. A PSA is very brief (e.g., 20 seconds) and can provide far-reaching, low-cost publicity for your program. A pre-taped or written announcement can be provided to radio stations; the text for a video spot or an actual videotaped message can be provided to television stations.

TIP: The Short Term revisions to the LCR do not require water systems to produce PSAs. However, PSAs are one of the additional activities that large and small water systems can provide to meet the additional PE requirements.

EPA encourages CWSs to submit PSAs to five radio or television stations with the largest audiences in the community. If you select this method, PSAs must be submitted once every twelve months for as long as the system continues to exceed the lead action level.

Conduct Media Outreach

To help disseminate your PE messages, call on your established media contacts who already understand your mission to inform and protect the public. When you pitch messages to newspapers, TV, or radio outlets, clearly explain what information you are trying to communicate and why. Explain to the media in clear and open terms what you are required to do to communicate about an action level exceedance and make it easy for them to identify the most important information, including information that led to detection of the action level exceedance, the populations most at risk from elevated lead levels in drinking water and potential health effects, actions consumers can take to reduce their risks, and actions your water system is taking to address the problem. The easier you make it for the media to accurately cover your story, the more likely you are to get the results you want.

TIP: Whenever possible, visit your media contacts in person to request coverage.

TIP: In addition to sending the required press releases or notifications, consider:

- Offering a spokesperson to be interviewed on the air. Ideally, you have identified and prepped spokespeople to understand your program and how to deal with the pressures associated with an interview, so that they will seem calm (and not evasive or defensive).
- Writing a draft story or an op-ed for the newspaper and providing a completed draft to an editor.
- Providing radio and television programs with talking points, sources for impartial information (such as links to the EPA or CDC Web-based information on lead), contacts at the health department, and suggestions of people they can interview for a story.
- Providing statistics, charts, graphics (photographs, video footage, drawings, maps) along with your text to make it easy for different types of media to broadcast your story.

When you send press releases or notices to radio and TV stations and newspapers, write “PRESS RELEASE FOR DRINKING WATER NOTICE” at the top of the notice to emphasize its importance and ensure that it will be printed or aired in a timely manner.

Don’t be upset if a media story isn’t exactly as you would want it, but politely tell a reporter if a significant piece of information is wrong or missing so that they can get the correct information out to the public.

If a newspaper will not publish a story or press release, you may want to consider buying space to print the notice in its entirety, though it is not required. You should buy an advertisement as close to the front of the paper as possible and make it large enough that people will easily see it. Your initial planning should have determined if this may be a concern and if you should budget for purchasing advertisement space.

Communicate Directly with the Public

Effective PE campaigns can minimize the chances of overreaction to an action level exceedance and can help focus your community's attention on the source of a problem. A robust PE campaign that explains what an exceedance means and the specific steps you are taking to address the issue can be an excellent public relations tool. Such a campaign will help to create a partnership between you and your customers that demonstrates your commitment to providing safe water and reduces the prevalence of the "us versus them" mentality.

Quickly distributing the required and recommended materials to all your target populations will help reduce the chance that people will become alarmed and overreact to information about an exceedance. If you have planned your distribution of materials through communication channels and partners effectively and established close relationships with conduits, your materials should reach your community promptly and educate them about the issue.

Tips for Working with the Media

- Be truthful and up-front about local water quality issues and the exceedance.
- Don't be defensive when answering questions.
- Answer questions as well as you can, but don't be afraid to say that you need to check on something if there is a question you can't answer (and once you find the information, quickly report back on what you've found).
- Keep in mind that reporters are not familiar with State or Federal requirements for safe drinking water - avoid technical jargon!
- Provide additional sources of information (for instance, referrals to State contacts, local experts, or EPA fact sheets).
- Be sensitive to the fact that reporters may be working on tight deadlines.
- Provide a list of the elements that the media must address to adequately inform the public about potential risks and how to manage them.

Public Meetings

In addition to distributing messages and materials to your community, public meetings are an effective avenue for directly communicating with your audiences about the exceedance and your activities to address it. Well advertised public meetings provide a forum where the public can ask questions and meet individuals responsible for addressing the lead issue. Many public meeting formats and styles are available. A few options are described below.

Speakers' forums feature formal presentations by a speaker or group of speakers, with questions taken during or after their presentations. This format ensures that the message is specific and that everyone receives the same message, and offers the greatest control over the content, flow, and outcome of the event. However, it allows limited interaction with the audience, with the exception of a brief question and answer period, and therefore restricts the amount of public feedback received.

In **round table discussions,** the public is given an opportunity to present their opinion or ask questions in a facilitated discussion. This format can be a facilitated open dialogue among all participants, or small group discussions between members of the public with facilitators or experts moderating the conversations. Like testimony, round table discussions can offer a great deal of interaction and opinion sharing, and are a good way to gauge public opinion. Likewise, planners have little control over the content. All participants may not receive the same message, especially where multiple conversations take place simultaneously.

Open houses are a one-on-one information exchange format, where experts sit at tables or booths and the public is invited to talk to them, share their concerns, and ask questions. Written materials can be available for the public to take with them. In this informal format, the public can "digest" what they want, either a brief, direct answer to a question or detailed information. All participants do not receive the same message (i.e., what they learn depends on what they ask). While there is no way to anticipate the content of topics raised, this approach offers more control than other open forums because the exchange is one-on-one, not across a large group.

Availability sessions combine structured speakers forums and open houses. Prior to formal presentations, speakers are available to talk to people and answer questions. The structured presentations offer an opportunity to disseminate the message as planned. The one-on-one interaction supplements the formal information exchange by giving citizens an opportunity to ask questions or speak to an involved party about their concerns. This dialog also can help the speakers anticipate questions or concerns that may be raised in front of reporters and a large audience.

Considerations for Public Meetings

Meeting planning is an involved process that requires many detailed steps.

- Public meetings should be held as soon as possible following an exceedance. The availability of newsworthy information generates public interest and increases the likelihood of a high turnout at meetings. Proper spacing of the meetings over time is important to keep the media and public interested in the issue.
- Scheduling of public meetings should take into consideration other events that could pose conflicts, such as the school calendar (e.g., start of school, vacations), other community meetings, holidays, or other events of importance to the target audience.
- Meeting site selection should be based on attracting the greatest variety of interested audience segments. Meetings should be geographically distributed throughout the community. Selecting locations that are convenient to large numbers of people in certain groups can increase interest and boost media coverage geared to those groups.
- Proper publicity is a crucial planning step for each public event, because a high turnout is needed to ensure the widest distribution of the message. A few outreach considerations for public meetings are:
  - Where target populations are clustered in a few apartment communities, meeting notices should be posted on bulletin boards, in hallways, laundry rooms, and other public areas; placed as advertisements or articles in community newsletters; or be advertised through mailings to each apartment.
  - Local elected officials should be invited, and receive "courtesy calls" in advance of any public advertising.
  - Translators should be provided at meetings held in areas with significant non-English speaking populations. Provide sign-language interpreters for the hearing impaired.

Conclude Your PE Activities at the End of the Exceedance

Your public education program is required to provide ongoing messages until the action level exceedance has ended. This continued education effort will keep your public informed about any continuing issues related to lead in drinking water and keep them abreast of progress your system is making toward resolving the problem. Once the issue has been resolved, continue to provide the public information about lead in drinking water. Your Consumer Confidence Report is an opportunity to provide ongoing education to your customers about the importance of addressing lead in drinking water and your program's monitoring and education activities. (See Section 1 for required language for use in CCRs.)

After the exceedance has ended, conducting follow-up focus group testing with your customers can help to ensure that the messages in your materials were received as intended and that all target audiences understood your materials. The results of such an analysis can help mold future efforts and guide you on areas where you may want to refine your planning.

Media surveys can assess how well the information was reported by television and radio stations and the press. Media coverage can be monitored by reviewing the Web sites of local media outlets, or purchasing the services of media surveillance firms. Relevant information includes the frequency of stories, the media through which they were reported, and the content of the stories (e.g., whether the most important facts were covered or if any erroneous information was reported).

Polling citizens can directly gauge their opinion of the outreach by determining citizens' awareness of the exceedance, how they perceived the information, where they received the information, and if they were satisfied with and could understand it. The telephone is the most common polling avenue, however, phone polls should be undertaken and interpreted with caution, as the subjects of a phone survey may not include low income residents with no telephone (door-to-door surveys are an option in these areas). Pollsters should be able to speak all of the languages represented in the service area. Your conduit organizations should be surveyed as well.

Conclusion

The steps outlined in this guidance document and the tips provided are designed to provide you with all of the background you need to design and implement an effective PE program. Following the guidance provided will allow you to reach out to all members of your community, including those that are the most vulnerable to adverse health effects from lead exposure, with messages and delivery methods that meet your community's diverse communication needs. The partnerships you create with your local media, public health community, and other key partners can serve as important ties for all of your work, regardless of whether your system experiences an exceedance. Most importantly, the guidance provided in this document establishes an effective framework for communicating with your public about the many issues your water system addresses.

Appendix A

Frequently Asked Questions

Lead in Drinking Water – Frequently Asked Questions Template*

What are the Sources of Lead?

Lead is a common metal found in the environment. Drinking water is one possible source of lead exposure. The main sources of lead exposure are lead-based paint and lead-contaminated dust or soil, and some plumbing materials. In addition, lead can be found in certain types of pottery, pewter, brass fixtures, and cosmetics. Other sources of lead include exposures in the work place and exposure from certain hobbies (lead dust can be carried on clothing and shoes.) Lead is found in some toys, some playground equipment, and some children's metal jewelry. Everyone, especially children, should be encouraged to regularly wash their hands to reduce lead dust exposure.

Why is there lead in my drinking water?

Lead is not usually found in water that comes from wells or water treatment plants. More commonly lead can enter drinking water when the water comes in contact with plumbing materials such as lead pipes or lead solder, or when it comes in contact with faucets, valves, and other components made of brass (brass may have lead in it). This interaction is referred to as corrosion.

Even though your public water supplier may deliver water that meets all federal and state standards for lead, you may end up with elevated lead levels in your drinking water because of the plumbing in your home.

What is the water system doing about it?

Our water system is working to educate the public about steps for reducing exposure to lead in drinking water and the health risks associated with exposure to lead. In addition, our water system is conducting a number of activities aimed at reducing high lead levels and possible exposures. For example [insert information on your system's corrosion control program; lead service line replacement efforts; and/or other activities you are undertaking to reduce lead in drinking water in your community.]

What can I do to make my water safer?

> **TIP:** If you are considering replacing lead containing plumbing fixtures, keep in mind that plumbing fixtures labeled lead-free may have up to 8% lead.

Flush your pipes before drinking, and only use cold water for cooking and drinking. The more time water has been sitting in your home's pipes, the more lead it may contain. Anytime the water in a particular faucet has not been used for six hours or longer, "flush" your cold-water pipes by running the water until it becomes as cold as it will get. This could take as little as five to thirty seconds if there has been recent heavy water use such as showering or toilet flushing. Otherwise, it could take two minutes or longer. Your water utility will inform you if longer flushing times are needed to respond to local conditions. Please note that flushing may not be effective in high-rise buildings.

Use only water from the cold-water tap for drinking, cooking, and especially for making baby formula. Hot water is likely to contain higher levels of lead.

You may also consider using a lead reducing filter tested and certified by an independent third party for such ability per the standards set by NSF International.

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* **Note**: These questions and answers are provided to water systems to help address the types of questions that may arise from customers during implementation of a PE Program. This information or the language above should not be used as a substitute for the mandatory content required under the LCR, as outlined in Section 1.

What will lead do to me or my family?

Lead is a toxic metal that is harmful to human health when it is ingested or inhaled. The greatest risk it to infants, young children, and pregnant women. Small amounts slow down normal mental development in growing children and alter the development of other organs and systems. The effects of lead on the brain are associated with lowered IQ in children. Adults with kidney problems and high blood pressure are more likely to be affected by low levels of lead than the general population. Lead is stored in the bones allowing it to be released even after exposure stops. The presence in bone increases the concern for exposure at all points of the life cycle.

EPA estimates that 10 to 20 percent of human exposure to lead may come from lead in drinking water. Infants who consume mostly formula prepared with tap water can receive 40 to 60 percent of their exposure to lead from drinking water.

Does boiling water remove lead?

No, boiling water does not remove lead. Boiling water can concentrate lead levels and increase the amount of lead in water.

If I boil water for making formula, will it increase or remove lead?

Boiling water will concentrate lead levels, which can increase the amount of lead in the water. Always flush your faucet and use water from the cold water tap when making formula.

Why can't I use hot water from the tap for drinking, cooking, or making baby formula?

Hot water dissolves lead more quickly than cold water and is therefore more likely to contain greater amounts of lead. Never use water from the hot water tap for drinking, cooking, or making baby formula.

Will my filter remove lead?

Some filters can remove lead from drinking water. If you use a filter, be sure to get one that is tested and certified by an independent third party per the standards developed by NSF International. Be sure to maintain and replace a filter device in accordance with the manufacturer's instructions to protect water quality.

My neighbors got their water tested and found lead. Is my water safe/are my test results accurate?

Each home should be tested separately for lead. Lead usually gets into drinking water through contact with plumbing materials such as lead pipes or lead solder, or faucets, valves, and fixtures made of brass (brass contains some lead). Since each home has different plumbing pipes and materials, test results are likely to be different for each home.

Can I get my water tested for lead?

Yes. EPA recommends testing your water for lead by a certified laboratory; lists are available from your state or local drinking water authority. Testing costs between $20 and $100. Since you cannot see, taste, or smell lead dissolved in water, testing is the only sure way of telling whether there are elevated levels of lead in your drinking water. You should be particularly suspicious if your home has lead pipes (lead is a dull gray metal that is soft enough to be easily scratched with a house key), if you see signs of corrosion (frequent leaks, rust-colored water, stained dishes or laundry), or if your non-plastic plumbing is less than five years old. Your water supplier may have useful information, including whether the service connector used in your home or area is made of lead. Testing is especially important in high-rise buildings where flushing may not be effective.

What do you mean when you say the Action Level has been exceeded?

The action level for lead is a level at which the regulatory agency is concerned about corrosion and requires water systems to take additional steps to protect users of the water. Our water system is required to notify the public when our test results show levels of lead above the 15 ppb action level in >10% of samples collected.

Is there anything else I can do beyond flushing my tap or buying bottled water?

Test your water first to determine whether your water has elevated levels of lead. If there is lead in your water, you may want to consider buying a water filter to lower lead levels. Replacing pipes and fixtures with products certified against NSF/ANSI Standard 61 can lower lead levels. In addition, be sure to clean all water outlet screens regularly to remove small sediments that may contain lead.

Where can I get more information on lead?

For more information, visit ***www.epa.gov/lead*** or call EPA's Safe Drinking Water Hotline at 1-800-426-4791. Your state or local public health department will also be able to provide information about lead.

Appendix B

Public Education Material Templates*

- Checklist for Implementing Your PE Program
- General Public Education Notice and ListServ/Email Announcement
- Web site Announcement
- Public Service Announcement
- Water Bill Statement/Insert
- Press Release
- Brochure
- Poster
- Consumer Notice of Tap Water Results

*Customizable versions of these templates are available for download at: http://www.epa.gov/safewater/lcrmr/compliancehelp.html

Checklist for Implementing Your PE Program

- ☐ Notify your Primacy Agency of an action level exceedance triggering your PE program.
- ☐ Notify your system's decision maker(s) of the exceedance.
- ☐ Review your PE requirements (Section 1) and the timeline for delivering PE materials (see Tables 2 or 3 on Pages 8 or 9).
- ☐ Notify your communication or outreach team of the exceedance and enlist their assistance in implementing your plan.
- ☐ Inform all of your employees about your activities so that they can respond to customer questions or issues.
- ☐ Implement your phone tree and contact your conduit organizations to let them know that an exceedance has occurred and that you will be sending them materials for distribution.
- ☐ Update your PE material templates with information on the exceedance, actions you are taking to address it, and any other relevant information.
- ☐ Identify groups (e.g. schools and community organizations) that can translate PE materials for non-English consumers.
- ☐ Prepare mailing labels for conduit organizations and other dissemination mechanisms.
- ☐ Duplicate your pamphlets, flyers, posters, or other printed materials and prepare to deliver them to your customers and conduit organizations.
- ☐ Meet with representatives from your local health agency (in person or by phone) to alert them to the exceedance and provide them with materials they can distribute to the public.
- ☐ Send a press release to your local media outlets (print, TV, and radio).
- ☐ Reach out to your established media contacts and work with them to distribute your key messages.
- ☐ Coordinate with your spokesperson/spokespeople to conduct media interviews.
- ☐ Document your PE activities and report back to your Primacy Agency on completion of activities as required.
- ☐ Update your system's Web site (if required) to include PE materials and key messages for the public.
- ☐ Schedule and conduct public meetings as needed.
- ☐ Continue to conduct your monitoring activities as required.
- ☐ Notify the public when the action level exceedance has ended.

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[*] Customizable versions of these templates are available for download at: http://www.epa.gov/safewater/lcrmr/compliancehelp.html

General Public Education Notice and ListServ/Email Announcement Template

The following language meets the revised PE requirements under the 2007 short-term revisions and clarifications to the Lead and Copper Rule (LCR). **Your notice must include the topic areas in bold below**. Anything in italics under each topic area is required language and cannot be changed while anything in regular text must be covered, but you have the flexibility to use either the suggested language or your own words to cover these topics.

Your notice must begin with the following opening statement (though you have the option to include a title of the pamphlet or brochure of your choosing):

IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER

[Insert name of water system] found elevated levels of lead in drinking water in some homes/buildings. Lead can cause serious health problems, especially for pregnant women and children 6 years and younger. Please read this notice closely to see what you can do to reduce lead in your drinking water.

Health Effects of Lead

Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

Sources of Lead

Lead is a common metal found in the environment. Drinking water is one possible source of lead exposure. The main sources of lead exposure are lead-based paint and lead-contaminated dust or soil, and some plumbing materials. In addition, lead can be found in certain types of pottery, pewter, brass fixtures, food, and cosmetics. Other sources include exposure in the work place and exposure from certain hobbies (lead can be carried on clothing or shoes). Lead is found in some toys, some playground equipment, and some children's metal jewelry.

Brass faucets, fittings, and valves, including those advertised as "lead-free," may contribute lead to drinking water. The law currently allows end-use brass fixtures, such as faucets, with up to 8 percent lead to be labeled as "lead free."

[Insert utility specific information describing your community's source water – e.g. "The source of water from XX Reservoir does not contain lead" or "Community X does not have any lead in its source water or water mains in the street."] When water is in contact with pipes [or service lines] or plumbing that contains lead for several hours, the lead may enter drinking water. Homes built before 1988 are more likely to have lead pipes or lead solder.

EPA estimates that 10 to 20 percent of a person's potential exposure to lead may come from drinking water. Infants who consume mostly formula mixed with lead-containing water can receive 40 to 60 percent of their exposure to lead from drinking water.

Don't forget about other sources of lead such as lead paint, lead dust, and lead in soil. Wash your children's hands and toys often as they can come into contact with dirt and dust containing lead.

[*] Customizable versions of these templates are available for download at: http://www.epa.gov/safewater/lcrmr/compliancehelp.html

Steps You Can Take To Reduce Your Exposure To Lead In Your Water

1. **Run your water to flush out lead.** Run water for 15-30 seconds to flush lead from interior plumbing [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State Primacy Agency approves the wording] or until it becomes cold or reaches a steady temperature before using it for drinking or cooking, if it hasn't been used for several hours. [It is likely that systems with lead service lines will need to collect data to determine the appropriate flushing time for lead service lines.][1]
2. **Use cold water for cooking and preparing baby formula.** Do not cook with or drink water from the hot water tap; lead dissolves more easily into hot water. Do not use water from the hot water tap to make baby formula.
3. **Do not boil water to remove lead.** Boiling water will not reduce lead.
4. **Look for alternative sources or treatment of water.** You may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010 or **www.nsf.org** for information on performance standards for water filters. Be sure to maintain and replace a filter device in accordance with the manufacturer's instructions to protect water quality.
5. **Test your water for lead.** Call us at [insert phone number for your water system] to find out how to get your water tested for lead. [Include information on your water system's testing program. For example, do you provide free testing? Are there labs in your area that are certified to do lead in water testing?]
6. **Get your child's blood tested.** Contact your local health department or healthcare provider to find out how you can get your child tested for lead if you are concerned about exposure.
7. **Identify and replace plumbing fixtures containing lead.** Brass faucets, fittings, and valves, including those advertised as "lead-free," may contribute lead to drinking water. The law currently allows end-use brass fixtures, such as faucets, with up to 8% lead to be labeled as "lead free." Visit the Web site at **www.nsf.org** to learn more about lead-containing plumbing fixtures.

What Happened? What is Being Done?

[Insert information about how and when the exceedance was discovered in your community and provide information on the source(s) of lead in the drinking water, if known.]

[Insert information about what your system is doing to reduce lead levels in homes in your community.]

[Insert information about lead service lines in your community, how a consumer can find out of they have a lead service line, what your water system is doing to replace lead service lines, etc.]

[Insert information about the history of lead levels in tap water samples in your community. For example, have they declined substantially over time? Have they been low and risen recently? Is there a known reason for any lead level changes?]

For More Information

Call us at [Insert Number] (if applicable) *or visit our Web site at* [insert Web site Here]. *For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's Web site at* ***www.epa.gov/lead*** *or contact your health care provider.*

[We recommend you include the name of your system and the date that the information is being distributed, along with the state water system ID, somewhere on the notice.]

[1]The bracketed language does not need to be included, as worded, in your materials. It is designed to alert systems that, where applicable, lead service lines might affect the flushing time.

*Customizable versions of these templates are available for download at: http://www.epa.gov/safewater/lcrmr/compliancehelp.html

General Public Education Notice and ListServ/Email Announcement Template (Spanish)

The following language meets the revised PE requirements under the 2007 short-term revisions and clarifications to the Lead and Copper Rule (LCR). **Your notice must include the topic areas in bold below.** Anything in *italics* under each topic area is required language and cannot be changed while anything in regular text must be covered, but you have the flexibility to use either the suggested language or your own words to cover these topics.

Your notice must begin with the following opening statement (though you have the option to include a title of the pamphlet or brochure of your choosing):

INFORMACIÓN IMPORTANTE ACERCA DEL PLOMO EN SU AGUA POTABLE

[Insert name of water system] ha encontrado altos niveles de plomo en el agua potable de algunos domicilios y edificios. El plomo puede causar serios problemas a la salud, especialmente a las mujeres encintas y a los niños de 6 años o menores. Por favor lea esta información atentamente para ver qué puede hacer para reducir el plomo en su agua potable.

Efectos del plomo en la salud

El plomo puede causar serios problemas de salud si cantidades excesivas provenientes del agua potable, u otras fuentes, se introducen en su cuerpo. Puede dañar al cerebro y a los riñones y también puede interferir en la producción de glóbulos rojos que transportan oxígeno a todas las partes de su cuerpo. El riesgo más serio de exposición al plomo es para los infantes, los niños de baja edad y las mujeres encintas. Los científicos han conectado los efectos del plomo en el cerebro con coeficientes de inteligencia más reducidos en los niños. Niveles bajos de plomo tienen un mayor efecto en los adultos con problemas de riñón y de alta presión sanguínea que en los adultos sanos. El plomo se almacena en los huesos y puede ser dispersado más tarde en la vida. Durante el embarazo, el bebé recibe plomo proveniente de los huesos maternos lo cual puede afectar el desarrollo de su cerebro.

Fuentes del plomo

El plomo es un metal común que se encuentra en el medio ambiente. El agua potable es una posible fuente de exposición al plomo. Las fuentes principales de exposición al plomo radican en la pintura con plomo, la tierra o el polvo contaminado con plomo y ciertos materiales de fontanería. Además, el plomo puede encontrarse en ciertos tipos de cerámica, peltre, accesorios de latón, alimentos y de productos cosméticos. Otras fuentes de exposición incluyen el lugar de trabajo y la exposición asociada con ciertos pasatiempos (es posible transportar plomo en la ropa o los zapatos). El plomo se halla en algunos juguetes, equipos de parques infantiles y en ciertas joyas metálicas para niños.

Los grifos, los accesorios y las válvulas de latón, inclusive las que se anuncian estar “sin plomo,” pueden contribuir al plomo en el agua potable. En la actualidad la ley permite que los accesorios de uso final de latón, tales como los grifos, cuyo tenor puede tener hasta 8 por ciento de plomo, puedan etiquetarse “sin plomo.”

[Insert utility specific information describing your community’s source water – e.g. “The source of water from XX Reservoir does not contain lead” or “Community X does not have any lead in its source water or water mains in the street.”] Cuando el agua entra en contacto con tuberías [o líneas de servicio] o con fontanería que contiene plomo y durante varias horas, el plomo puede introducirse en el agua potable. Las casas construidas antes de 1988 suelen tener tuberías de plomo o soldaduras de plomo.

La EPA calcula que de 10 a 20 por ciento de la exposición posible de una persona al plomo puede provenir del agua potable. Los infantes que consumen mayormente fórmula para bebés mezclada con agua que contiene plomo pueden ingerir con el agua potable hasta entre 40 y 60 por ciento de su exposición al plomo.

No se olvide que existen otras fuentes de plomo tales como la pintura con contenido de plomo, el polvo de plomo y el plomo en la tierra. Lave las manos de sus hijos y los juguetes a menudo ya que pueden entrar en contacto con el polvo y la suciedad que contienen plomo.

Medidas que usted puede emprender para reducir su exposición al plomo en el agua

1. **Deje correr el agua para eliminar el plomo.** Deje correr el agua unos 15 a 30 segundos, si no se ha utilizado en varias horas, para eliminar el plomo de la fontanería interior [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State Primacy Agency approves the wording] o hasta que se enfríe o alcance una temperatura constante antes de utilizar el agua para beber o cocinar. [It is likely that systems with lead service lines will need to collect data to determine the appropriate flushing time for lead service lines.][1]
2. **Utilice agua fría para cocinar y para preparar la fórmula para bebés.** No cocine ni beba agua del grifo de agua caliente ya que el plomo se disuelve más fácilmente en agua caliente. No utilice el grifo de agua caliente para preparar la fórmula para bebés.
3. **No hierva el agua para eliminar plomo.** El agua hervida no reduce el plomo.
4. **Busque otras fuentes o formas de tratar el agua.** Usted puede comprar agua en botellas o un filtro de agua. Lea el embalaje para cerciorarse de que el filtro está aprobado para reducir el plomo, o póngase en contacto con NSF International, marcando el 800-NSF-8010 ó visite www.nsf.org para más información sobre las normas de rendimiento de los filtros de agua. Asegúrese de mantener y de reemplazar el dispositivo filtrante conforme a las instrucciones del fabricante para proteger la calidad del agua.
5. **Pida que se analice su agua para saber si tiene plomo.** Llámenos al [insert phone number for your water system] para saber cómo obtener un análisis del plomo en su agua. [Include information on your water system's testing program. For example, do you provide free testing? Are there labs in your area that are certified to do lead in water testing?]
6. **Pida un análisis de la sangre de sus hijos.** Póngase en contacto con el departamento de salud de su zona o con su proveedor de atención médica para saber cómo puede obtener un análisis de sangre de su hijo si es que le preocupa una posible exposición.
7. **Identifique y reemplace el equipo de fontanería que contenga plomo.** Los grifos, los accesorios y las válvulas de latón, inclusive las que se anuncian estar "sin plomo", pueden contribuir al plomo en el agua potable. En la actualidad la ley permite que los accesorios de uso final de latón, tales como los grifos, cuyo tenor puede tener hasta 8 por ciento de plomo, puedan etiquetarse "sin plomo". Visite el sitio Internet en ***www.nsf.org*** para aprender más acerca de los equipos de fontanería que contienen plomo.

¿Que pasó? ¿Qué se está haciendo?

[Insert information about how and when the exceedance was discovered in your community and provide information on the source(s) of lead in the drinking water, if known.]

[Insert information about what your system is doing to reduce lead levels in homes in your community.]

[insert information about lead service lines in your community, how a consumer can find out if they have a lead service line, what your water system is doing to replace lead service lines, etc.]

[Insert information about the history of lead levels in tap water samples in your community. For example, have they declined substantially over time? Have the been low and risen recently? Is there a known reason for any lead level changes?]

Para más información

Llámenos al [Insert Number] (if applicable) *ó visite nuestro sitio Internet* [insert Web site Here]. *Para más información sobre la reducción de la exposición al plomo en su hogar/edificio y los efectos del plomo, visite el sitio Internet de EPA en **www.epa.gov/lead** o póngase en contacto con su proveedor de atención médica.*

[We recommend you include the name of your system and the date that the information is being distributed, along with the water system ID, somewhere on the notice.]

Web Site Announcement Template

Large community water systems (serving greater than 100,000 people) are **required** to provide a Public Education notice on a publicly accessible Web site. The following language can serve as an announcement on the Web site, but to meet the revised PE requirements under the 2007 short-term revisions and clarifications to the Lead and Copper Rule (LCR), large CWSs should include a link to their General Public Education Notice, which includes all of the required language. Refer to page 45 of this Appendix for the General Public Education Notice template. Small systems are also encouraged to utilize electronic information dissemination where available.

IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER

[Insert name of your water system] found elevated levels of lead in drinking water in some homes/ buildings in our community. Lead can cause serious health problems, especially for pregnant women and children 6 years and younger. Please read the following notice [insert link to Public Education Notice] closely to see what you can do to reduce lead in your drinking water and to learn what [Insert name of your water system] is doing to address this problem.

Call us at [insert your water system phone number] for more information Date [Insert the date posted]

[Provide your system's General Public Education Notice here or link to it within your Web site.]

Web Site Announcement Template (Spanish)

Large community water systems (serving greater than 100,000 people) are required to provide a Public Education notice on a publicly accessible Web site. The following language can serve as an announcement on the Web site, but to meet the revised PE requirements under the 2007 short-term revisions and clarifications to the Lead and Copper Rule (LCR), large CWSs should include a link to their General Public Education Notice, which includes all of the required language. Refer to page 47 of this Appendix for the General Public Education Notice template. Small systems are also encouraged to utilize electronic information dissemination where available.

INFORMACIÓN IMPORTANTE ACERCA DEL PLOMO EN SU AGUA POTABLE

[Insert name of your water system] ha encontrado altos niveles de plomo en el agua potable de algunos domicilios y edificios en su comunidad. El plomo puede causar serios problemas a la salud, especialmente a las mujeres encintas y a los niños de 6 años o menores. Por favor lea el siguiente aviso [insert link to Public Education Notice] detenidamente y aprenda qué puede hacer para reducir el plomo en su agua potable y qué hace [Insert name of your water system] para resolver este problema.

Llámenos a [insert your water system phone number] para más información - Fecha [Insert the date posted]

[Provide your system's General Public Education Notice here or link to it within your Web site.]

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*Customizable versions of these templates are available for download at: http://www.epa.gov/safewater/lcrmr/compliancehelp.html

Public Service Announcement Template

The latest revisions to the LCR do not require water systems to produce Public Service Announcements. However, Public Service Announcements are one of the additional activities that large and small water systems can produce to meet the additional PE requirements (see Table 3). Although you should include the following information, which is consistent with the PE requirements under the 2007 short-term revisions and clarifications to the Lead and Copper Rule (LCR), the media outlets may opt to not include all of the information.

IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER

[Insert name of water system] found elevated levels of lead in drinking water in some homes/buildings in our community. Lead can cause serious health problems, especially for pregnant women and children 6 years and younger.

Lead is a common metal found in the environment. Drinking water is one possible source of lead exposure. The main sources of lead exposure are lead-based paint and lead-contaminated dust or soil.

The following are some of the steps you can take to reduce your exposure to lead in your water including:

- **Run your water for 15 – 30 seconds to flush out lead.** [Or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the Primacy Agency approves the wording]
- **Use cold water for cooking and preparing baby formula.**
- **Do not boil water to remove lead.**

*Call [insert name of your water system] at [insert number] (if applicable) or visit our Web site at [insert Web site Here] to find out how to get your water tested for lead or for more information. For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's Web site at **www.epa.gov/lead** or contact your health care provider.*

This notice is brought to you by [insert the name of your water system]. State Water System ID# [insert your water system's ID number] Date [Insert the date distributed]

*Customizable versions of these templates are available for download at: http://www.epa.gov/safewater/lcrmr/compliancehelp.html

Public Service Announcement Template (Spanish)

The latest revisions to the LCR do not require water systems to produce Public Service Announcements. However, Public Service Announcements are one of the additional activities that large and small water systems can produce to meet the additional PE requirements (see Table 3). Although you should include the following information, which is consistent with the PE requirements under the 2007 short-term revisions and clarifications to the Lead and Copper Rule (LCR), the media outlets may opt to not include all of the information.

INFORMACIÓN IMPORTANTE ACERCA DEL PLOMO EN SU AGUA POTABLE

[Insert name of your water system] ha encontrado altos niveles de plomo en el agua potable de algunos domicilios y edificios en su comunidad. El plomo puede causar serios problemas a la salud, especialmente a las mujeres encintas y a los niños de 6 años o menores.

El plomo es un metal común que se encuentra en el medio ambiente. El agua potable es una posible fuente de exposición al plomo. Las fuentes principales de la exposición al plomo radican en la pintura que contiene plomo, la tierra o el polvo contaminado con plomo y ciertos materiales de fontanería.

A continuación siguen unos cuantos pasos para ayudarle a reducir su exposición al plomo en el agua, inclusive:

- **Deje correr el agua para 15 - 30 segundos para eliminar el plomo.** [Or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the Primacy Agency approves the wording.]
- **Utilice agua fría para cocinar y para preparar la fórmula para bebés.**
- **No hierva el agua para eliminar plomo.**

*Llame a [insert name of your water system] marcando el [insert number] (si aplica) o visite nuestro sitio Internet en [insert Web site Here] para aprender cómo pedir un análisis de plomo en su agua o para más información. Para más información sobre la reducción de la exposición al plomo en su hogar/edificio y los efectos del plomo, visite el sitio Internet de EPA en **www.epa.gov/lead** o póngase en contacto con su proveedor de atención médica.*

Esta notificación le ha sido entregada por [insertar el nombre de su sistema de aguas]. Número de identificación del sistema de aguas del estado [insert your water system's ID number] Fecha [Insert the date distributed]

Press Release Template

The revisions to the LCR PE **require** systems to provide two press releases per year during a lead action level exceedance. For small systems, the Primacy Agency can waive this requirement if the system provides a notice to each household. The following template contains information that is consistent with the LCR requirements. Providing local information, quotes from a local water system and/or public health official, and information about actions your system is taking to address the exceedance can help the media to accurately convey information about the exceedance and your system's action steps. Please note, media outlets may choose not to include all of the information that you provide in your Press Release.

PRESS RELEASE DRINKING WATER NOTICE

IMPORTANT INFORMATION ABOUT LEAD IN [INSERT NAME OF YOUR COMMUNITY] DRINKING WATER

Recent drinking water quality monitoring conducted by *[insert name of water system/community] has found elevated levels of lead in drinking water in some homes/buildings in* [insert name of community or area served by your water system]. Although the primary sources of lead exposure are lead-based paint and lead-contaminated dust or soil, the U.S. Environmental Protection Agency estimates that 10 to 20 percent of a person's potential exposure to lead may come from drinking water.

[Insert name of community] is concerned about the health of their residents because *lead can cause serious health problems if too much enters your body from drinking water or other sources, especially for pregnant women and children 6 years and younger. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.*

[Insert information about what happened and what is being done? You may wish to include information about the exceedance and the history of lead levels in tap water samples in your community. For example, have they declined substantially over time? Have they been low and risen recently? Is there a known reason for any lead level changes? Explain the steps being taken to reduce lead levels, such as corrosion control treatment and/or lead service line replacement.]

There are steps you can take to reduce your exposure to lead in your water:

- **Run your water to flush out lead.** Run water for 15-30 seconds to flush lead from interior plumbing or until it becomes cold or reaches a steady temperature before using it for drinking or cooking, if it hasn't been used for several hours. [It is likely that systems with lead service lines will need to collect data to determine the appropriate flushing time for lead service lines.][1]
- **Use cold water for cooking and preparing baby formula.**
- **Do not boil water to remove lead.** Boiling water will not reduce lead.
- **Look for alternative drinking water sources or treatment of water.** You may want to consider purchasing bottled water or a water filter.
- **Test your water for lead.** Call us at [insert phone number for your water system] to find out how to get your water tested for lead.

[1]The bracketed language does not need to be included, as worded, in your materials. It is designed to alert systems that, where applicable, lead service lines might affect the flushing time.

[*]Customizable versions of these templates are available for download at: http://www.epa.gov/safewater/lcrmr/compliancehelp.html

- **Get your child's blood tested.** Contact your local health department or healthcare provider to find out how you can get your child tested for lead if you are concerned about exposure.
- **Identify and replace plumbing fixtures containing lead.**

There are several actions that [insert name of water system of community] are taking to address this lead in drinking water concern. [Insert a quote from a water system official letting the public know what actions the system is taking to address the lead action level exceedance or insert a list of action steps.]

Call [insert name of your water system] at [insert number] (if applicable) or visit [insert name of your water system] Web site at [insert Web site Here] to find out how to get your water tested for lead or for more information on steps [insert name of your water system] is taking to address the lead action level exceedance. For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's Web site at ***www.epa.gov/lead*** *or contact your health care provider.*

[We recommend you include the name of your system and the date that the information is being distributed, along with the state water system ID, somewhere on the notice.]

Press Release Template (Spanish)

The revisions to the LCR PE **require** systems to provide two press releases per year during a lead action level exceedance. For small systems, the Primacy Agency can waive this requirement if the system provides a notice to each household. The following template contains information that is consistent with the LCR requirements. Providing local information, quotes, from a local water system and/or public health official, and information about actions your system is taking to address the exceedance can help the media to accurately convey information about the exceedance and your system's action steps. Please note, media outlets may choose not to include all of the information that you provide in your Press Release.

COMUNICADO DE PRENSA PARA EL AVISO SOBRE EL AGUA POTABLE

INFORMACIÓN IMPORTANTE SOBRE EL PLOMO EN EL AGUA POTABLE DE [INSERT NAME OF YOUR COMMUNITY]

El monitoreo reciente de la calidad del agua potable realizado por [*insert name of water system/community*] ha encontrado altos niveles de plomo en el agua potable de algunos hogares/edificios de [*insert name of community or area served by your water system*]. Aunque las fuentes principales de exposición al plomo radican en la pintura con plomo o en la tierra o el polvo contaminados con plomo, la Agencia de Protección del Medio Ambiente (Environmental Protection Agency, o EPA por sus siglas en inglés) de los Estados Unidos calcula que de 10 a 20 por ciento de la posible exposición al plomo de una persona puede provenir del agua potable.

La salud de sus residentes es de gran importancia para [Insert name of community] debido a que el *plomo puede causar serios problemas de salud si su cuerpo recibe demasiado plomo proveniente del agua potable u otras fuentes, especialmente en el caso de las mujeres encintas y de los niños de 6 años o menores. Puede dañar al cerebro y a los riñones e interferir en la producción de glóbulos rojos que transportan oxígeno a todas las partes de su cuerpo. Los científicos han conectado los efectos del plomo en el cerebro con coeficientes de inteligencia más reducidos en los niños. Niveles bajos de plomo tienen un mayor efecto en los adultos con problemas de riñón y de alta presión sanguínea que en los adultos sanos. El plomo se almacena en los huesos y puede ser dispersado más tarde en la vida. Durante el embarazo, el bebé recibe plomo proveniente de los huesos maternos lo cual puede afectar el desarrollo de su cerebro.*

[Insert information about what happened and what is being done? You may wish to include information about the exceedance and the history of lead levels in tap water samples in your community. For example, have they declined substantially over time? Have they been low and risen recently? Is there a known reason for any lead level changes?] Explain the steps being taken to reduce lead levels, such as corrosion control treatment and/or lead service line replacement.]

Existen pasos que usted puede seguir para reducir su exposición al plomo en el agua:

- **Deje correr el agua para eliminar el plomo.** Deje correr el agua unos 15 a 30 segundos, si no se ha utilizado en varias horas, para eliminar el plomo de la fontanería interior o hasta que se enfríe o alcance una temperatura constante antes de utilizar el agua para beber o cocinar. [It is likely that systems with lead service lines will need to collect data to determine the appropriate flushing time for lead service lines.][1]
- **Utilice agua fría para cocinar y para preparar la fórmula para bebés.**
- **No hierva el agua para eliminar plomo.** El agua hervida no reduce el plomo.

[1]The bracketed language does not need to be included, as worded, in your materials. It is designed to alert systems that, where applicable, lead service lines might affect the flushing time.

*Customizable versions of these templates are available for download at: http://www.epa.gov/safewater/lcrmr/compliancehelp.html

- **Busque otras fuentes o formas de tratar el agua.** Usted puede comprar agua en botellas o un filtro de agua.
- **Pida que se analice su agua para saber si tiene plomo.** Llámenos al [insert phone number for your water system] para saber cómo obtener un análisis del plomo en su agua.
- **Pida un análisis de la sangre de sus hijos.** Póngase en contacto con el departamento de salud de su zona o con su proveedor de atención médica para saber cómo puede obtener un análisis de sangre de su hijo si es que le preocupa una posible exposición.
- **Identifique y reemplace el equipo de fontanería que contenga plomo.**

Existen varias medidas que [insert name of water system of community] ha emprendido para resolver este tema del plomo en el agua potable. [Insert a quote from a water system official letting the public know what actions the system is taking to address the lead action level exceedance or insert a list of action steps.]

Llame a [insert name of your water system] marcando el [insert number] (si aplica) o visite el sitio Internet de [insert name of your water system] en [insert Web site Here] para aprender cómo puede pedir un análisis del plomo en su agua o para más información sobre los pasos que emprende [insert name of your water system] para resolver la excedencia del nivel de acción para el plomo. Para más información sobre la reducción de la exposición al plomo en su hogar/edificio y los efectos del plomo, visite el sitio Internet de EPA en ***www.epa.gov/lead*** o póngase en contacto con su proveedor de atención médica.

[We recommend you include the name of your system and the date that the information is being distributed along with the state water system ID, somewhere on the notice.]

Water Bill Language/Insert Template

The following paragraph includes language that meets the LCR PE requirements and must be included in water bill notification in the event of a lead action level exceedance; however, you should consult with the Primacy Agency because the rule allows the Primacy Agency to allow alternate message content and delivery mechanisms. Please note, the following statement may be placed directly on the water bill itself or included as an insert.

IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER

[Insert name of your water system] found high levels of lead in drinking water in some homes. Lead can cause serious health problems. For more information, please call [insert name and phone number of water system] or visit [insert your Web site].

Water Bill Language/Insert Template (Spanish)

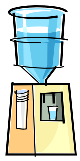
The following paragraph includes language that meets the LCR PE requirements and must be included in water bill notification in the event of a lead action level exceedance; however, you should consult with the Primacy Agency because the rule allows the Primacy Agency to allow alternate message content and delivery mechanisms. Please note, the following statement may be placed directly on the water bill itself or included as an insert.

INFORMACIÓN IMPORTANTE ACERCA DEL PLOMO EN SU AGUA POTABLE

[Insert name of your water system] ha encontrado altos niveles de plomo en el agua potable de algunos hogares. El plomo puede tener graves consecuencias para la salud. Para más información, por favor llame a [insert name and phone number of water system] ó visite [insert your Web site].

Public Education Brochure

4. Look for alternative sources or treatment of water. You may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010 or www.nsf.org for information on performance standards for water filters. Be sure to maintain and replace a filter device in accordance with the manufacturer's instructions to protect water quality.



5. Test your water for lead. Call us at [insert phone number for your water system] to find out how to get your water tested for lead. [Include information on your water system's testing program. For example, do you provide free testing? Are there labs in your area that are certified to do lead in water testing?]

6. Get your child's blood tested. Contact your local health department or healthcare provider to find out how you can get your child tested for lead, if you are concerned about exposure.

7. Identify and replace plumbing fixtures containing lead. New brass faucets, fittings, and valves, including those advertised as "lead-free," may contribute lead to drinking water. The law currently allows end-use brass fixtures, such as faucets, with up to 8% lead to be labeled as "lead-free."

WHAT HAPPENED?
WHAT IS BEING DONE?

[Insert information about how and when the exceedance was discovered in your community and provide information on the source(s) of lead in the drinking water, if known.]

[Insert information about what your system is doing to reduce lead levels in homes in your community.]

[Insert information about lead service lines in your community, how a consumer can find out of they have a lead service line, what your water system is doing to replace lead service lines, etc.]

[Insert information about the history of lead levels in tap water samples in your community. For example, have they declined substantially over time? Have they been low and risen recently? Is there a known reason for any lead level changes?]

FOR MORE INFORMATION

Call us at [Insert Number] (if applicable) or visit our Web site at [insert Web site Here]. For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's Web site at www.epa.gov/lead, or contact your health care provider.

[We recommend you include the name of your system and the date that the information is being distributed, along with the state water system ID, somewhere on the notice.]

Lead in Drinking Water

The United States Environmental Protection Agency (EPA) and **[insert name of water supplier here]** are concerned about lead in your drinking water. Although most homes have very low levels of lead in their drinking water, some homes in the community have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under Federal law we are required to have a program in place to minimize lead in your drinking water by **[insert date when corrosion control will be completed for your system]**.

This program includes:

1. Corrosion control treatment (treating the water to make it less likely that lead will dissolve into the water);
2. Source water treatment (removing any lead that is in the water at the time it leaves our treatment facility); and
3. A public education program.

We are also required to replace the portion of each lead service line that we own if the line contributes lead concentrations of more than 15 ppb after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at **[insert water system's phone number here]**.

This brochure also explains the simple steps you can take to protect yourself by reducing your exposure to lead in drinking water.

Important Information about Lead in Your Drinking Water
[Insert name of water system] found elevated levels of lead in drinking water in some homes/buildings. Lead can cause serious health problems, especially for pregnant women and young children. Please read this information closely to see what you can do to reduce lead in your drinking water.

HEALTH EFFECTS OF LEAD

Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

SOURCES OF LEAD

Lead is a common metal found in the environment. Drinking water is one possible source of lead exposure. The main sources of lead exposure are lead-based paint and lead-contaminated dust or soil, and some plumbing materials. In addition, lead can be found in certain types of pottery, pewter, brass fixtures, food, and cosmetics. Other sources include exposure in the work place and exposure from certain hobbies (lead can be carried on clothing or shoes). Lead is found in some toys, some playground equipment, and some children's metal jewelry.

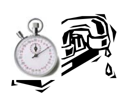
Brass faucets, fittings, and valves, including those advertised as "lead-free," may contribute lead to drinking water. The law currently allows end-use brass fixtures, such as faucets, with up to 8 percent lead to be labeled as "lead-free."

[CWS – Insert utility specific information describing your community's source water – e.g. "The source of water from XX Reservoir does not contain lead" or "Community X does not have any lead in its source water or water mains in the street."] When water is in contact with pipes [or service lines], and plumbing containing lead for several hours, the lead may enter drinking water. Homes built before 1988 are more likely to have lead pipes or lead solder.

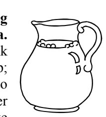
EPA estimates that 10 to 20 percent of a person's potential exposure to lead may come from drinking water. Infants who consume mostly formula mixed with lead-containing water can receive 40 to 60 percent of their exposure to lead from drinking water.

Don't forget about other sources of lead such as lead paint, lead dust, and lead in soil. Wash your children's hands and toys often as they can come into contact with dirt and dust containing lead.

STEPS YOU CAN TAKE TO REDUCE YOUR EXPOSURE TO LEAD IN YOUR WATER



1. Run your water to flush out lead. Run water for 15-30 seconds to flush lead from interior plumbing [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State Primacy Agency approves the wording] or until it becomes cold or reaches a steady temperature before using it for drinking or cooking, if it hasn't been used for several hours. [It is likely that systems with lead service lines will need to collect data to determine the appropriate flushing time for lead service lines.][1]



2. Use cold water for cooking and preparing baby formula. Do not cook with or drink water from the hot water tap; lead dissolves more easily into hot water. Do not use water from the hot water tap to make baby formula.

3. Do not boil water to remove lead. Boiling water will not reduce lead.

[1] The bracketed language does not need to be included, as worded, in your materials. It is designed to alert systems that, where applicable, lead service lines might affect the flushing time.

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Public Education Brochure (Spanish)

los filtros de agua. Asegúrese de mantener y de reemplazar el dispositivo filtrante conforme a las instrucciones del fabricante para proteger la calidad del agua.

5. Pida que se analice su agua para saber si tiene plomo. Llámenos al [insert phone number for your water system] para saber cómo obtener un análisis del plomo en su agua. [Include information on your water system's testing program. For example, do you provide free testing? Are there labs in your area that are certified to do lead in water testing?]

6. Pida un análisis de la sangre de sus hijos. Póngase en contacto con el departamento de salud de su zona o con su proveedor de atención médica para saber cómo puede obtener un análisis de sangre de su hijo si es que le preocupa una posible exposición.

7. Identifique y reemplace el equipo de fontanería que contenga plomo. Los grifos, los accesorios y las válvulas de latón, inclusive las que se anuncian estar "sin plomo", pueden contribuir al plomo en el agua potable. En la actualidad la ley permite que los accesorios de uso final de latón, tales como los grifos, cuyo tenor puede tener hasta 8 por ciento de plomo, puedan etiquetarse "sin plomo". Visite el sitio Internet en www.nsf.org para aprender más acerca de los equipos de fontanería que contienen plomo.

¿QUE PASÓ? ¿QUÉ SE ESTÁ HACIENDO?

[Insert information about how and when the exceedance was discovered in your community and provide information on the source(s) of lead in the drinking water, in known.]

[Insert information about what your system is doing to reduce lead levels in homes in community.]

[Insert information about lead service lines in your community, how a consumer can find out if they have a lead service line, what your water system is doing to replace lead service lines, etc.]

[Insert information about the history of lead levels in tap water samples in your community. For example, have they declined substantially over time? Have they been low and risen recently? Is there a known reason for any lead level changes?]

PARA MÁS INFORMACIÓN

Llámenos al [Insert Number] (if applicable) ó visite nuestro sitio Internet [insert Web site Here]. Para más información sobre la reducción de la exposición al plomo en su hogar/edificio y los efectos del plomo, visite el sitio Internet de EPA en www.epa.gov/lead *o póngase en contacto con su proveedor de atención médica*

[We recommend you include the name of your system and the date that the information is being distributed, along with the water system ID, somewhere on the notice.]

Plomo en el Agua Potable

[You may add your logo here.]

El plomo en su agua potable es un tema importante para la Agencia de Protección del Medio Ambiente (Environmental Protection Agency, o EPA por sus siglas en inglés) y [**insert name of water supplier here**]. Aunque el nivel de plomo es muy bajo en el agua potable de la mayoría de hogares, algunos domicilios en la comunidad tienen niveles de plomo que exceden el nivel de acción de 15 partes por mil millones (ppb), es decir 0,015 miligramos de plomo por litro de agua (mg/L). En virtud de la ley federal, debemos implementar un programa que minimice el plomo en su agua potable antes de [**insert date when corrosion control will be completed for your system**].

Este programa incluye:

1. un tratamiento de control de la corrosión (el agua tratada evita mejor que el plomo se disuelva en el agua);
2. el tratamiento del agua de origen (eliminación del plomo en el agua cuando sale de nuestra instalación de tratamiento); y
3. un programa de educación pública.

También debemos reemplazar la parte de cada línea de servicio de plomo de la que somos propietarios cuando dicha línea contribuye concentraciones de plomo que exceden 15 pbb tras realizar el programa de tratamiento integral. Si tiene cualquier pregunta sobre nuestra forma de cumplir con los requisitos del reglamento sobre el plomo no dude en llamarnos al [**insert water system's phone number here**].

Este folleto también explica pasos sencillos que usted puede emprender para protegerse al reducir la exposición al plomo en el agua potable.

INFORMACIÓN IMPORTANTE ACERCA DEL PLOMO EN SU AGUA POTABLE

[Insert name of water system] ha encontrado altos niveles de plomo en el agua potable de algunos domicilios y edificios. El plomo puede causar serios problemas a la salud, especialmente a las mujeres encintas y a los niños pequeños. Se ruega lea esta información atentamente para ver qué puede hacer para reducir el plomo en su agua potable.

EFECTOS DEL PLOMO EN LA SALUD

El plomo puede causar serios problemas de salud si cantidades excesivas provenientes del agua potable, u otras fuentes, se introducen en su cuerpo. Puede dañar al cerebro y a los riñones e interferir en la producción de glóbulos rojos que transportan oxígeno a todas las partes de su cuerpo. El riesgo más serio de exposición al plomo es para los infantes, los niños de baja edad y las mujeres encintas. Los científicos han conectado los efectos del plomo en el cerebro con coeficientes de inteligencia más reducidos en los niños. Niveles bajos de plomo tienen un mayor efecto en los adultos con problemas de riñón y de alta presión sanguínea que en los adultos sanos. El plomo se almacena en los huesos y puede ser dispersado más tarde en la vida. Durante el embarazo, el bebé recibe plomo proveniente de los huesos maternos lo cual puede afectar el desarrollo de su cerebro.

FUENTES DEL PLOMO

El plomo es un metal común que se encuentra en el medio ambiente. El agua potable es una posible fuente de exposición al plomo. Las fuentes principales de exposición al plomo radican en la pintura con plomo, la tierra o el polvo contaminado con plomo y ciertos materiales de fontanería. Además, el plomo puede encontrarse en ciertos tipos de cerámica, peltre, accesorios de latón, alimentos y de productos cosméticos. Otras fuentes de exposición incluyen el lugar de trabajo y la exposición asociada con ciertos pasatiempos (es posible transportar plomo en la ropa o los zapatos). El plomo se halla en algunos juguetes, equipos de parques infantiles y en ciertas joyas metálicas para niños.

Los grifos, los accesorios y las válvulas de latón, inclusive las que se anuncian estar "sin plomo", pueden contribuir al plomo en el agua potable. En la actualidad la ley permite que los accesorios de uso final de latón, tales como los grifos, cuyo tenor puede tener hasta 8 por ciento de plomo, puedan etiquetarse "sin plomo".

[Insert utility specific information describing your community's source water – e.g. "The source of water from XX Reservoir does not contain lead" or "Community X does not have any lead in its source water or water mains in the street."] Cuando el agua entra en contacto con tuberías [o líneas de servicio] o con fontanería que contiene plomo y durante varias horas, el plomo puede introducirse en el agua potable. Las casas construidas antes de 1988 suelen tener tuberías de plomo o soldaduras de plomo.

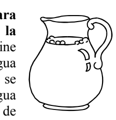
La EPA calcula que de 10 a 20 por ciento de la exposición posible de una persona al plomo puede provenir del agua potable. Los infantes que consumen mayormente fórmula para bebés mezclada con agua que contiene plomo pueden ingerir con el agua potable hasta entre 40 y 60 por ciento de su exposición al plomo.

No se olvide que existen otras fuentes de plomo tales como la pintura con contenido de plomo, el polvo de plomo y el plomo en la tierra. Lave las manos de sus hijos y los juguetes a menudo ya que pueden entrar en contacto con el polvo y la suciedad que contienen plomo.

MEDIDAS QUE USTED PUEDE EMPRENDER PARA REDUCIR SU EXPOSICIÓN AL PLOMO EN EL AGUA

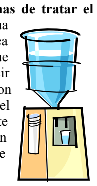
1. Deje correr el agua para eliminar el plomo. Deje correr el agua unos 15 a 30 segundos, si no se ha utilizado en varias horas, para eliminar el plomo de la fontanería interior [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State Primacy Agency approves the wording] o hasta que se enfríe o alcance una temperatura constante antes de utilizar el agua para beber o cocinar. [It is likely that systems with lead service lines will need to collect data to determine the appropriate flushing time for lead service lines.][1]

2. Utilice agua fría para cocinar y para preparar la fórmula para bebés. No cocine ni beba agua del grifo de agua caliente ya que el plomo se disuelve más fácilmente en agua caliente. No utilice el grifo de agua caliente para preparar la fórmula para bebés.



3. No hierva el agua para eliminar plomo. El agua hervida no reduce el plomo.

4. Busque otras fuentes o formas de tratar el agua. Usted puede comprar agua en botellas o un filtro de agua. Lea el embalaje para cerciorarse de que el filtro está aprobado para reducir el plomo, o póngase en contacto con NSF International, marcando el 800-NSF-8010 ó visite www.nsf.org para más información sobre las normas de rendimiento de



[1]The bracketed language does not need to be included, as worded, in your materials. It is designed to alert systems that, where applicable, lead service lines might affect the flushing time.
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Public Education Poster

Important Information about Lead in Your Drinking Water

[Insert name of water system] found elevated levels of lead in drinking water in some homes/buildings. Lead can cause serious health problems, especially for pregnant women and young children. Please read this information closely to see what you can do to reduce lead in your drinking water.

Health Effects of Lead

Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

Sources of Lead

Lead is a common metal found in the environment. Drinking water is one possible source of lead exposure. The main sources of lead exposure are lead-based paint and lead-contaminated dust or soil, and some plumbing materials. In addition, lead can be found in certain types of pottery, pewter, brass fixtures, food, and cosmetics. Other sources include exposure in the work place and exposure from certain hobbies (lead can be carried on clothing or shoes). Lead is found in some toys, some playground equipment, and some children's metal jewelry.

Brass faucets, fittings, and valves, including those advertised as "lead-free," may contribute lead to drinking water. The law currently allows end-use brass fixtures, such as faucets, with up to 8 percent lead to be labeled as "lead-free."

[CWS–Insert utility specific information describing your community's source water – e.g. "The source of water from XX Reservoir does not contain lead" or "Community X does not have any lead in its source water or water mains in the street."] When water is in contact with pipes [or service lines], and plumbing containing lead for several hours, the lead may enter drinking water. Homes built before 1988 are more likely to have lead pipes or lead solder.

EPA estimates that 10 to 20 percent of a person's potential exposure to lead may come from drinking water. Infants who consume mostly formula mixed with lead-containing water can receive 40 to 60 percent of their exposure to lead from drinking water. Don't forget about other sources of lead such as lead paint, lead dust, and lead in soil. Wash your children's hands and toys often as they can come into contact with dirt and dust containing lead.

Steps You Can Take to Reduce Exposure to Lead in Water

1. Run your water to flush out lead. Run water for 15-30 seconds to flush lead from interior plumbing [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State Primacy Agency approves the wording] or until it becomes cold or reaches a steady temperature before using it for drinking or cooking, if it hasn't been used for several hours. [It is likely that systems with lead service lines will need to collect data to determine the appropriate flushing time for lead service lines.][1]

2. Use cold water for cooking and preparing baby formula. Do not cook with or drink water from the hot water tap; lead dissolves more easily into hot water. Do not use water from the hot water tap to make baby formula.

3. Do not boil water to remove lead. Boiling water will not reduce lead.

4. Look for alternative sources or treatment of water. You may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010 or www.nsf.org for information on performance standards for water filters. Be sure to maintain and replace a filter device in accordance with the manufacturer's instructions to protect water quality.

5. Test your water for lead. Call us at [insert phone number for your water system] to find out how to get your water tested for lead. [Include information on your water system's testing program. For example, do you provide free testing? Are there labs in your area that are certified to do lead in water testing?]

6. Get your child's blood tested. Contact your local health department or healthcare provider to find out how you can get your child tested for lead, if you are concerned about exposure.

7. Identify and replace plumbing fixtures containing lead. Brass faucets, fittings, and valves, including those advertised as "lead-free," may contribute lead to drinking water. The law currently allows end-use brass fixtures, such as faucets, with up to 8% lead to be labeled as "lead-free."

What happened? What is being done?

[Insert information about how and when the exceedance was discovered in your community and provide information on the source(s) of lead in the drinking water, if known.]

[Insert information about what your system is doing to reduce lead levels in homes in your community.]

[Insert information about lead service lines in your community, how a consumer can find out of they have a lead service line, what your water system is doing to replace lead service lines, etc.]

[Insert information about the history of lead levels in tap water samples in your community. For example, have they declined substantially over time? Have they been low and risen recently? Is there a known reason for any lead level changes?]

For More Information

Call us at [Insert Number] (if applicable) or visit our Web site at [insert Web site Here]. For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's Web site at www.epa.gov/lead, or contact your health care provider.

[We recommend you include the name of your system and the date that the information is being distributed, along with the state water system ID, somewhere on the notice.]

[1] The bracketed language does not need to be included, as worded, in your materials. It is designed to alert systems that, where applicable, lead service lines might affect the flushing time.

[*] Customizable versions of these templates are available for download at: http://www.epa.gov/safewater/lcrmr/compliancehelp.html

Public Education Poster (Spanish)

INFORMACIÓN IMPORTANTE ACERCA DEL PLOMO EN SU AGUA POTABLE

[Insert name of water system] ha encontrado altos niveles de plomo en el agua potable de algunos domicilios y edificios. El plomo puede causar serios problemas a la salud, especialmente a las mujeres encintas y a los niños pequeños. Por favor lea esta información atentamente para ver qué puede hacer para reducir el plomo en su agua potable

Efectos del plomo en la salud

El plomo puede causar serios problemas de salud si cantidades excesivas provenientes del agua potable, u otras fuentes, se introducen en su cuerpo. Puede dañar al cerebro y a los riñones y también puede interferir en la producción de glóbulos rojos que transportan oxígeno a todas las partes de su cuerpo. El riesgo más serio de exposición al plomo es para los infantes, los niños de baja edad y las mujeres encintas. Los científicos han conectado los efectos del plomo en el cerebro con coeficientes de inteligencia más reducidos en los niños. Niveles bajos de plomo tienen un mayor efecto en los adultos con problemas de riñón y de alta presión sanguínea que en los adultos sanos. El plomo se almacena en los huesos y puede ser dispersado más tarde en la vida. Durante el embarazo, el bebé recibe plomo proveniente de los huesos maternos lo cual puede afectar el desarrollo de su cerebro.

Fuentes del plomo

El plomo es un metal común que se encuentra en el medio ambiente. El agua potable es una posible fuente de exposición al plomo. Las fuentes principales de exposición al plomo radican en la pintura con plomo, la tierra o el polvo contaminado con plomo y ciertos materiales de fontanería. Además, el plomo puede encontrarse en ciertos tipos de cerámica, peltre, accesorios de latón, alimentos y de productos cosméticos. Otras fuentes de exposición incluyen el lugar de trabajo y la exposición asociada con ciertos pasatiempos (es posible transportar plomo en la ropa o los zapatos). El plomo se halla en algunos juguetes, equipos de parques infantiles y en ciertas joyas metálicas para niños.

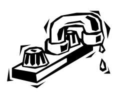
Los grifos, los accesorios y las válvulas de latón, inclusive las que se anuncian estar "sin plomo," pueden contribuir al plomo en el agua potable. En la actualidad la ley permite que los accesorios de uso final de latón, tales como los grifos, cuyo tenor puede tener hasta 8 por ciento de plomo, puedan etiquetarse "sin plomo."

[Insert utility specific information describing your community's source water – e.g. "The source of water from XX Reservoir does not contain lead" or "Community X does not have any lead in its source water or water mains in the street."] Cuando el agua entra en contacto con tuberías [o líneas de servicio] o con fontanería que contiene plomo y durante varias horas, el plomo puede introducirse en el agua potable. Las casas construidas antes de 1988 suelen tener tuberías de plomo o soldaduras de plomo.

La EPA calcula que de 10 a 20 por ciento de la exposición posible de una persona al plomo puede provenir del agua potable. Los infantes que consumen mayormente fórmula para bebés mezclada con agua que contiene plomo pueden ingerir con el agua potable hasta entre 40 y 60 por ciento de su exposición al plomo.

No se olvide que existen otras fuentes de plomo tales como la pintura con contenido de plomo, el polvo de plomo y el plomo en la tierra. Lave las manos de sus hijos y los juguetes a menudo ya que pueden entrar en contacto con el polvo y la suciedad que contienen plomo.

Medidas que usted puede emprender para reducir su exposición al plomo en el agua



1. Deje correr el agua para eliminar el plomo. Deje correr el agua unos 15 a 30 segundos, si no se ha utilizado en varias horas, para eliminar el plomo de la fontanería interior [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State Primacy Agency approves the wording] o hasta que se enfríe o alcance una temperatura constante antes de utilizar el agua para beber o cocinar. [It is likely that systems with lead service lines will need to collect data to determine the appropriate flushing time for lead service lines.][1]

2. Utilice agua fría para cocinar y para preparar la fórmula para bebés. No cocine ni beba agua del grifo de agua caliente ya que el plomo se disuelve más fácilmente en agua caliente. No utilice el grifo de agua caliente para preparar la fórmula para bebés.

3. No hierva el agua para eliminar plomo. El agua hervida no reduce el plomo.

4. Busque otras fuentes o formas de tratar el agua. Usted puede comprar agua en botellas o un filtro de agua. Lea el embalaje para cerciorarse de que el filtro está aprobado para reducir el plomo, o póngase en contacto con NSF International, marcando el 800-NSF-8010 ó visite www.nsf.org para más información sobre las normas de rendimiento de los filtros de agua. Asegúrese de mantener y de reemplazar el dispositivo filtrante conforme a las instrucciones del fabricante para proteger la calidad del agua.

5. Pida que se analice su agua para saber si tiene plomo. Llámenos al [insert phone number for your water system] para saber cómo obtener un análisis del plomo en su agua. [Include information on your water system's testing program. For example, do you provide free testing? Are there labs in your area that are certified to do lead in water testing?]

6. Pida un análisis de la sangre de sus hijos. Póngase en contacto con el departamento de salud de su zona o con su proveedor de atención médica para saber cómo puede obtener un análisis de sangre de su hijo si es que le preocupa una posible exposición.

7. Identifique y reemplace el equipo de fontanería que contenga plomo. Los grifos, los accesorios y las válvulas de latón, inclusive las que se anuncian estar "sin plomo", pueden contribuir al plomo en el agua potable. En la actualidad la ley permite que los accesorios de uso final de latón, tales como los grifos, cuyo tenor puede tener hasta 8 por ciento de plomo, puedan etiquetarse "sin plomo". Visite el sitio Internet en www.nsf.org para aprender más acerca de los equipos de fontanería que contienen plomo.

¿Que pasó? ¿Qué se está haciendo?

[Insert information about how and when the exceedance was discovered in your community and provide information on the source(s) of lead in the drinking water, in known.]

[Insert information about what your system is doing to reduce lead levels in homes in your community.]

[Insert information about lead service lines in your community, how a consumer can find out if they have a lead service line, what your water system is doing to replace lead service lines, etc.]

[Insert information about the history of lead levels in tap water samples in your community. For example, have they declined substantially over time? Have they been low and risen recently? Is there a known reason for any lead level changes?]

Para más información

Llámenos al [Insert Number] (if applicable) ó *visite nuestro sitio Internet* [insert Web site Here]*. Para más información sobre la reducción de la exposición al plomo en su hogar/edificio y los efectos del plomo, visite el sitio Internet de EPA en www.epa.gov/lead o póngase en contacto con su proveedor de atención médica.*

[1]The bracketed language does not need to be included, as worded, in your materials. It is designed to alert systems that, where applicable, lead service lines might affect the flushing time.

*Customizable versions of these templates are available for download at: http://www.epa.gov/safewater/lcrmr/compliancehelp.html

Consumer Notice of Tap Water Results Template for Community Water Systems

[Information in italics is required/mandatory language and cannot be changed]

[Select the appropriate number from the 6 possible options]

Dear (Consumer's Name),
[Insert name of your water system] appreciates your participation in the lead tap monitoring program. A lead level of [insert data from the laboratory analysis of the sample collected-make sure the value is in pbb] was reported for the sample collected on [date] at your location, [insert address of customer].

1. Your result, as well as the 90th percentile value for our water system, is below the lead action level of 15 parts per billion.

What Does This Mean?
Under the authority of the Safe Drinking Water Act, the U.S. Environmental Protection Agency (EPA) set the action level for lead in drinking water at 15 ppb. This means utilities must ensure that water from the customer's tap does not exceed this level in at least 90 percent of the homes sampled (90th percentile value). The action level is *the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.* If water from the tap does exceed this limit, then the utility must take certain steps to correct the problem. Because lead may pose serious health risks, the EPA set a Maximum Contaminant Level Goal (MCLG) of zero for lead. The MCLG is *the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.*

What Are The Health Effects of Lead?
Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

What Are The Sources of Lead?
The primary sources of lead exposure for most children are deteriorating lead-based paint, lead-contaminated dust, and lead-contaminated residential soil. Lead is found is some toys, some playground equipment, some children's metal jewelry, and some traditional pottery. Exposure to lead is a significant health concern, especially for young children and infants whose growing bodies tend to absorb more lead than the average adult. Although your home's drinking water lead levels were below the action level, if you are concerned about lead exposure, parents should ask their health care providers about testing children for high levels of lead in the blood.

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*Customizable versions of these templates are available for download at: http://www.epa.gov/safewater/lcrmr/compliancehelp.html

What Can I Do To Reduce Exposure to Lead in Drinking Water?
Although your test results were below EPA's action level, you may still want to take steps to further reduce your exposure.

- **Run your water to flush out lead.** If water hasn't been used for several hours, run water for 15-30 seconds to flush lead from interior plumbing [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State approves the wording] or until it becomes cold or reaches a steady temperature before using it for drinking or cooking.
- **Use cold water for cooking and preparing baby formula.**
- **Do not boil water to remove lead.**
- **Look for alternative sources or treatment of water (such as bottled water or water filters).**
- **Re-test your water for lead periodically.**
- **Identify and replace plumbing fixtures containing lead.**

For More Information
Call us at [insert your water system's phone number]. For more information on reducing lead exposure around your home and the health effects of lead, visit EPA's Web site at ***www.epa.gov/lead***, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Consumer Notice of Tap Water Results Template for Community Water Systems

[Information in italics is required/mandatory language and cannot be changed]

[Select the appropriate number from the 6 possible options]

Dear (Consumer's Name),
[Insert name of your water system] appreciates your participation in the lead tap monitoring program. A lead level of [insert data from the laboratory analysis of the sample collected-make sure the value is in pbb] was reported for the sample collected on [date] at your location, [insert address of customer].

2. Your result was below the lead action level of 15 parts per billion. However, the 90th percentile value for our system was above the lead action level.

What Does This Mean?
Under the authority of the Safe Drinking Water Act, the U.S. Environmental Protection Agency (EPA) set the action level for lead in drinking water at 15 ppb. This means utilities must ensure that water from the customer's tap does not exceed this level in at least 90 percent of the homes sampled (90th percentile value). The action level is *the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.* If water from the tap does exceed this limit, then the utility must take certain steps to correct the problem. Because lead may pose serious health risks, the EPA set a Maximum Contaminant Level Goal (MCLG) of zero for lead. The MCLG is *the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.*

We are taking a number of steps to correct the problem. We will begin sampling for lead every 6 months so we can closely monitor the lead levels in our water system. Your continued participation and support in our lead tap monitoring program is very important. In addition, we will initiate a Public Education campaign to ensure our customers know about the action level exceedance, understand the health effects of lead, the sources of lead and actions they can take to reduce exposure to lead in drinking water. We will also monitor our source water, initiate controls to reduce the corrosivity of our water (corrosive water can cause lead to leach from plumbing materials that contain lead) and initiate lead service line replacement [for those systems with lead service lines].

What Are The Health Effects of Lead?
Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

What Are The Sources of Lead?
The primary sources of lead exposure for most children are deteriorating lead-based paint, lead-contaminated dust, and lead-contaminated residential soil. Exposure to lead is a significant health concern, especially for

young children and infants whose growing bodies tend to absorb more lead than the average adult. Lead is found in some toys, some playground equipment, some children's metal jewelry, and some traditional pottery. Although your home's drinking water lead levels were below the action level, if you are concerned about lead exposure, parents should ask their health care providers about testing children for high levels of lead in the blood. Lead is rarely found in source water, but enters tap water through corrosion of plumbing materials. Homes built before 1988 are more likely to have lead pipes or lead solder.

What Can I Do To Reduce Exposure to Lead in Drinking Water?
Although your test results were below EPA's action level, you may still want to take steps to further reduce your exposure.

- **Run your water to flush out lead.** Run water for 15-30 seconds to flush lead from interior plumbing [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State approves the wording] or until it becomes cold or reaches a steady temperature before using it for drinking or cooking, if it hasn't been used for several hours.
- **Use cold water for cooking and preparing baby formula.**
- **Do not boil water to remove lead.**
- **Look for alternative sources or treatment of water (such as bottled water or water filters).**
- **Re-test your water for lead periodically.**
- **Identify and replace plumbing fixtures containing lead.**

For More Information
Call us at [insert your water system's phone number]. For more information on reducing lead exposure around your home and the health effects of lead, visit EPA's Web site at ***www.epa.gov/lead***, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Consumer Notice of Tap Water Results Template for Community Water Systems

[Information in italics is required/mandatory language and cannot be changed]

[Select the appropriate number from the 6 possible options]

Dear (Consumer's Name),
[Insert name of your water system] appreciates your participation in the lead tap monitoring program. A lead level of [insert data from the laboratory analysis of the sample collected-make sure the value is in pbb] was reported for the sample collected on [date] at your location, [insert address of customer].

3. Your result is greater than the lead action level of 15 parts per billion. However, the 90th percentile value for our water system was below the lead action level.

What Does This Mean?
Under the authority of the Safe Drinking Water Act, the U.S. Environmental Protection Agency (EPA) set the action level for lead in drinking water at 15 ppb. This means utilities must ensure that water from the customer's tap does not exceed this level in at least 90 percent of the homes sampled (90th percentile value). The action level is *the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.* If water from the tap does exceed this limit, then the utility must take certain steps to correct the problem. Because lead may pose serious health risks, the EPA set a Maximum Contaminant Level Goal (MCLG) of zero for lead. The MCLG is *the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.*

Your lead level may be due to conditions unique to your home, such as the presence of lead soldier or brass faucets, fittings and valves that may contain lead. Our system works to keep the corrosivity of our water as low as possible (corrosive water can cause lead to leach from plumbing materials that contain lead) and there are actions you can take to reduce exposure. We strongly urge you to take the steps below to reduce your exposure to lead in drinking water.

What Are The Health Effects of Lead?
Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development. If you are concerned about lead exposure, you may want to ask your health care provider about testing children to determine levels of lead in their blood.

What Are The Sources of Lead?
Although most lead exposure occurs when people eat paint chips and inhale dust, or from contaminated soil, EPA estimates that 10 to 20 percent of human exposure to lead may come from lead in drinking water. Lead is rarely found in source water, but enters tap water through corrosion of plumbing materials. Homes built before 1988 are more likely to have lead pipes or lead solder. However, new homes are also at risk:

even legally "lead-free" plumbing may contain up to 8 percent lead. The most common problem is with brass or chrome-plated brass faucets and fixtures which can leach significant amounts of lead into the water, especially hot water.

What Can I Do To Reduce Exposure to Lead in Drinking Water?

- **Run your water to flush out lead.** If water hasn't been used for several hours, run water for 15-30 seconds to flush lead from interior plumbing [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State approves the wording] or until it becomes cold or reaches a steady temperature before using it for drinking or cooking.
- **Use cold water for cooking and preparing baby formula.** Do not cook with or drink water from the hot water tap; lead dissolves more easily into hot water. Do not use water from the hot water tap to make baby formula.
- **Do not boil water to remove lead.** Boiling water will not reduce lead.
- **Look for alternative sources or treatment of water.** You may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead.
- **Re-test your water for lead periodically.** Call us at [insert phone number for your water system] to find out how to get your water tested for lead. [Include information on your water system's testing program. For example, do you provide free testing? Are there labs in your area that are certified to do lead in water testing?]
- **Identify and replace plumbing fixtures containing lead.** Brass faucets, fittings, and valves, including those advertised as "lead-free," may contribute lead to drinking water. The law currently allows end-use brass fixtures, such as faucets, with up to 8% lead to be labeled as "lead free." The law also requires faucets and other end-use fixtures to be independently certified against NSF/ANSI Standard 61. Products that comply will be marked directly on the product or its packaging.

For More Information

Call us at [insert your water system's phone number]. For more information on reducing lead exposure around your home and the health effects of lead, visit EPA's Web site at ***www.epa.gov/lead***, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Consumer Notice of Tap Water Results Template for Community Water Systems

[Information in italics is required/mandatory language and cannot be changed]

[Select the appropriate number from the 6 possible options]

Dear (Consumer's Name),
[Insert name of your water system] appreciates your participation in the lead tap monitoring program. A lead level of [insert data from the laboratory analysis of the sample collected-make sure the value is in pbb] was reported for the sample collected on [date] at your location, [insert address of customer].

4. Your result is greater than the lead action level and the 90th percentile value for our water system is also greater than the lead action level of 15 parts per billion.

What Does This Mean?
Under the authority of the Safe Drinking Water Act, the U.S. Environmental Protection Agency (EPA set the action level for lead in drinking water at 15 ppb. This means utilities must ensure that water from the customer's tap does not exceed this level in at least 90 percent of the homes sampled (90th percentile result). The action level is *the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.* If water from the tap does exceed this limit, then the utility must take certain steps to correct the problem. Because lead may pose serious health risks, the EPA set a Maximum Contaminant Level Goal (MCLG) of zero for lead. The MCLG is *the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.*

We are taking a number of steps to correct the problem. We will begin sampling for lead every 6 months so we can closely monitor the lead levels in our water system. Your continued participation and support in our lead tap monitoring program is very important. In addition, we will initiate a Public Education campaign to ensure our customers know about the action level exceedance, understand the health effects of lead, the sources of lead and actions they can take to reduce exposure to leads in drinking water. We will also monitor our source water, initiate controls to reduce the corrosivity of our water (corrosive water can cause lead to leach from plumbing materials that contain lead) and initiate lead service line replacement [for those systems with lead service lines].

Although we are taking action to reduce lead levels, your elevated lead level may also be due to conditions unique to your home, such as the presence of lead soldier or brass faucets, fittings and valves that may contain lead. Our system works to keep the corrosivity of our water as low as possible (corrosive water can cause lead to leach from plumbing materials that contain lead) and there are actions you can take to reduce exposure. We strongly urge you to take the steps below to reduce your exposure to lead in drinking water.

What Are The Health Effects of Lead?
Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead

from the mother's bones, which may affect brain development. If you are concerned about lead exposure, you may want to ask your health care provider about testing children to determine levels of lead in their blood.

What Are The Sources of Lead?

Although most lead exposure occurs when people eat paint chips and inhale dust, or from contaminated soil, EPA estimates that 10 to 20 percent of human exposure to lead may come from lead in drinking water. Lead is rarely found in source water, but enters tap water through corrosion of plumbing materials. Homes built before 1988 are more likely to have lead pipes or lead solder. However, new homes are also at risk: even legally "lead-free" plumbing may contain up to 8 percent lead. The most common problem is with brass or chrome-plated brass faucets and fixtures which can leach significant amounts of lead into the water, especially hot water.

What Can I Do To Reduce Exposure to Lead in Drinking Water?

- **Run your water to flush out lead.** If water hasn't been used for several hours, run water for 15-30 seconds to flush lead from interior plumbing [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State approves the wording] or until it becomes cold or reaches a steady temperature before using it for drinking or cooking.
- **Use cold water for cooking and preparing baby formula.** Do not cook with or drink water from the hot water tap; lead dissolves more easily into hot water. Do not use water from the hot water tap to make baby formula.
- **Do not boil water to remove lead.** Boiling water will not reduce lead.
- **Look for alternative sources or treatment of water.** You may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead.
- **Re-test you water for lead periodically.** Call us at [insert phone number for your water system] to find out how to get your water tested for lead. [Include information on your water system's testing program. For example, do you provide free testing? Are there labs in your area that are certified to do lead in water testing?]
- **Identify and replace plumbing fixtures containing lead.** Brass faucets, fittings, and valves, including those advertised as "lead-free," may contribute lead to drinking water. The law currently allows end-use brass fixtures, such as faucets, with up to 8% lead to be labeled as "lead free." The law also requires faucets and other end-use fixtures to be independently certified against NSF/ANSI Standard 61. Products that comply will be marked directly on the product or its packaging.

For More Information

Call us at [insert your water system's phone number]. For more information on reducing lead exposure around your home and the health effects of lead, visit EPA's Web site at ***www.epa.gov/lead***, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

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[Select the appropriate number from the 6 possible options]

Dear (Consumer's Name),
[Insert name or your water system] appreciates your participation in the lead tap monitoring program. A lead level of [insert data from the laboratory analysis of the sample collected – make sure the value is in ppb] was reported for the sample collected on [date] at your location, [insert address of customer].

5. Your result was below the lead action level of 15 parts per billion. Our water system, however, has not yet calculated the 90th percentile value for our system, so we do not yet know if our system is above the lead action level.

What Does This Mean?
Under the authority of the Safe Drinking Water Act, the U.S. Environmental Protection Agency (EPA) set the action level for lead in drinking water at 15 parts per billion (ppb). This means utilities must ensure that water from the customer's tap does not exceed this level in at least 90 percent of homes sampled (90th percentile value). *The action level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.* If water from the tap does exceed this limit, then the utility must take certain steps to correct the problem. Because lead may pose serious health risks, the EPA set a Maximum Contaminant Level Goal (MCLG) of zero for lead. The MCLG *is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.*

We are in the process of determining the 90th percentile value for our water system. You can call us at [insert water system phone number] after [insert date that your 90th percentile calculation information will be available] to find out our system's 90th percentile value. If our 90th percentile value is found to be below the lead action level for lead no additional actions will be taken and we will continue our regular lead in drinking water monitoring program.

If our 90th percentile value is found to be in exceedance of the action level for lead, there are a number of steps that we will take to correct the problem. We will begin sampling for lead every 6 months so that we can closely monitor the lead levels in our water system. Your continued participation and support in our lead tap monitoring program is very important. In addition, we will initiate a Public Education campaign to ensure all of our customers know about the action level exceedance, understand the health effects of lead, the sources of lead, and actions they can take to reduce exposure to lead in drinking water. We will also monitor our source water, initiate controls to reduce the corrosivity of our water (corrosive water can cause lead to leach from plumbing materials that contain lead), and initiate lead service line replacement [for those systems with lead service lines].

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with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

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What Can I Do To Reduce Exposure to Lead in Drinking Water?

Although your test results were below EPA's action level, you may still want to take steps to further reduce your exposure.

- **Run your water to flush out lead.** Run water for 15 to 30 seconds to flush lead from interior plumbing [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State Primacy Agency approves the wording] or until it becomes cold or reaches a steady temperature before using it for drinking or cooking, if it hasn't been used for several hours.
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- **Identify and replace plumbing fixtures containing lead.**

For More Information

Call us at [insert your water system's phone number]. For more information on reducing lead exposure around your home and the health effects of lead, visit EPA's Web site at ***www.epa.gov/lead***, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

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[*]Customizable versions of these templates are available for download at: http://www.epa.gov/safewater/lcrmr/compliancehelp.html

Consumer Notice of Tap Water Results Template for Community Water Systems

[Information in italics is required/mandatory language and cannot be changed]

[Select the appropriate number from the 6 possible options]

Dear (Consumer's Name),
[Insert name or your water system] appreciates your participation in the lead tap monitoring program. A lead level of [insert data from the laboratory analysis of the sample collected – make sure the value is in ppb] was reported for the sample collected on [date] at your location, [insert address of customer].

6. Your result is greater than the lead action level of 15 parts per billion (ppb). Our water system, however, has not yet calculated the 90th percentile value for our system, so we do not yet know if our system is above the lead action level.

What Does This Mean?
Under the authority of the Safe Drinking Water Act, the U.S. Environmental Protection Agency (EPA) set the action level for lead in drinking water at 15 parts per billion (ppb). This means utilities must ensure that water from the customer's tap does not exceed this level in at least 90 percent of homes sampled (90th percentile value). *The action level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.* If water from the tap does exceed this limit, then the utility must take certain steps to correct the problem. Because lead may pose serious health risks, the EPA set a Maximum Contaminant Level Goal (MCLG) of zero for lead. The MCLG *is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.*

We are in the process of determining the 90th percentile value for our water system. You can call us at [insert water system phone number] after [insert date that your 90th percentile calculation information will be available] to find out our system's 90th percentile value. If our 90th percentile value is found to be below the lead action level for lead no additional actions will be taken and we will continue our regular lead in drinking water monitoring program.

If our 90th percentile value is found to be in exceedance of the action level for lead, there are a number of steps that we will take to correct the problem. We will begin sampling for lead every 6 months so that we can closely monitor the lead levels in our water system. Your continued participation and support in our lead tap monitoring program is very important. In addition, we will initiate a Public Education campaign to ensure all of our customers know about the action level exceedance, understand the health effects of lead, the sources of lead, and actions they can take to reduce exposure to lead in drinking water. We will also monitor our source water, initiate controls to reduce the corrosivity of our water (corrosive water can cause lead to leach from plumbing materials that contain lead), and initiate lead service line replacement [for those systems with lead service lines].

Your lead level may be due to conditions unique to your home, such as the presence of lead solder or brass faucets, fittings, and valves that may contain lead. Our system works to keep the corrosivity of our water as low as possible (corrosive water can cause lead to leach from plumbing materials that contain lead) and there are actions you can take to reduce exposure. We strongly urge you to take the steps below to reduce your exposure to lead in drinking water.

What Are The Health Effects of Lead?

Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have link the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development. If you are concerned about lead exposure, you may want to ask your health care provider about testing children to determine level of lead in their blood.

What Are The Sources of Lead?

The primary sources of lead exposure for most children are deteriorating lead-based paint, lead-contaminated dust, and lead-contaminated residential soil. Exposure to lead is a significant health concern, especially for young children and infants whose growing bodies tend to absorb more lead than the average adult. Although your home's drinking water levels were below the action level, if you are concerned about lead exposure, parents should ask their health care providers about testing children for high levels of lead in the blood. Lead is rarely found in source water, but enters tap water through corrosion of plumbing materials. Homes built before 1988 are more likely to have lead pipes or lead solder.

What Can I Do To Reduce Exposure to Lead in Drinking Water?

- **Run your water to flush out lead.** Run water for 15 to 30 seconds to flush lead from interior plumbing [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State Primacy Agency approves the wording] or until it becomes cold or reaches a steady temperature before using it for drinking or cooking, if it hasn't been used for several hours.
- **Use cold water for cooking and preparing baby formula.** Do not cool with or drink water from the hot water tap; lead dissolves easily into hot water. Do not use water from the hot water tap to make baby formula.
- **Do not boil water to remove lead.** Boiling water will not reduce lead.
- **Look for alternative sources or treatment of water.** You may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead.
- **Re-test you water for lead periodically.** Call us at [insert phone number for your water system] to find out how and when to re-test your water for lead. [Include information on your water system's testing program. For example, do you provide free testing? Are there labs in your area that are certified to do lead in water testing?]
- **Identify and replace plumbing fixtures containing lead.** Brass faucets, fittings, and valves, including those advertised as "lead-free," may contribute to lead in drinking water. The law currently allows end-use brass fixtures, such as faucets, with up to 8 percent lead to be labeled as "lead-free." The law also requires faucets and other end-use fixtures to be independently certified against NSF/ANSI Standard 61. Products that comply will be marked directly on the product or its packaging.

For More Information

Call us at [insert your water system's phone number]. For more information on reducing lead exposure around your home and the health effects of lead, visit EPA's Web site at ***www.epa.gov/lead***, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Consumer Notice of Tap Water Results Template for Community Water Systems (Spanish)

[Information in italics is required/mandatory language and cannot be changed]

[Select the appropriate number from the 6 possible options]

Estimado/a (Consumer's Name),
[Insert name of your water system] agradece su participación en el programa de monitoreo de plomo en el agua de grifo. Un nivel de [insert data from the laboratory analysis of the sample collected-make sure the value is in pbb] ha resultado de la muestra obtenida el [date], en la ubicación de [insert address of customer].

1. Su resultado, así como el valor de percentil 90 de nuestro sistema de aguas, se halla bajo el nivel de acción de plomo de 15 partes por mil millones, es decir 15 ppb.

¿Qué significa este resultado?
Bajo la autoridad de la Ley de Agua Potable Segura, la Agencia de Protección del Medio Ambiente (Environmental Protection Agency, o EPA por sus siglas en inglés) de los Estados Unidos estableció a 15 ppb el nivel de acción para el plomo en el agua potable. Esto significa que los servicios públicos deben asegurarse que el agua de grifo de sus clientes no exceda dicho nivel en el 90 por ciento de hogares analizados (valor de percentil 90). El nivel de acción significa *una concentración de contaminante que una vez excedida provoca el tratamiento u otros requisitos que debe acatar un sistema de aguas*. Si el agua de grifo excede dicho límite, el servicio público debe entonces emprender ciertas medidas para corregir el problema. Debido a que el plomo puede conllevar serios riesgos para la salud, la EPA ha establecido un Objetivo de Nivel Máximo de Contaminante (MCLG por sus siglas en inglés) de cero para el plomo. El MCLG es *el nivel de un contaminante en el agua potable cuyo valor menor no presenta ningún riesgo conocido o previsto para la salud. Los niveles MCLG ofrecen un margen de seguridad*.

¿Cómo afecta el plomo a la salud?
El plomo puede causar serios problemas de salud si cantidades excesivas provenientes del agua potable, u otras fuentes, se introducen en su cuerpo. Puede dañar al cerebro y a los riñones e interferir en la producción de glóbulos rojos que transportan oxígeno a todas las partes de su cuerpo. El riesgo más serio de exposición al plomo es para los infantes, los niños de baja edad y las mujeres encintas. Los científicos han conectado los efectos del plomo en el cerebro con coeficientes de inteligencia más reducidos en los niños. Niveles bajos de plomo tienen un mayor efecto en los adultos con problemas de riñón y de alta presión sanguínea que en los adultos sanos. El plomo se almacena en los huesos y puede ser dispersado más tarde en la vida. Durante el embarazo, el bebé recibe plomo proveniente de los huesos maternos lo cual puede afectar el desarrollo de su cerebro.

¿Cuáles son las fuentes del plomo?
Las fuentes principales de la exposición al plomo para la mayoría de niños radican en la pintura con plomo que se deteriora, la tierra residencial y el polvo contaminados con plomo. El plomo se halla en algunos juguetes, equipos de parques infantiles, joyas metálicas de niños y en algunas cerámicas tradicionales. La exposición al plomo es de especial importancia para la salud, especialmente para los niños de baja edad y para los infantes cuyos cuerpos crecientes tienen tendencia a absorber mayores cantidades de plomo que un adulto corriente. Aunque los niveles de plomo en el agua potable de su hogar se hallaron debajo del nivel de acción, si siente inquietud por la exposición al plomo, se recomienda que los padres consulten a

sus proveedores de atención médica acerca de un análisis de sangre para determinar cuáles son los niveles de plomo en los niños.

¿Qué puedo hacer para reducir la exposición al plomo en el agua de grifo?

- **Deje correr el agua para eliminar el plomo.** Deje correr el agua unos 15 a 30 segundos, si no se ha utilizado en varias horas, para eliminar el plomo de la fontanería interior [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State approves the wording] o hasta que se enfríe o alcance una temperatura constante antes de utilizar el agua para beber o cocinar.
- **Utilice agua fría para cocinar y para preparar la fórmula para bebés.**
- **No hierva el agua para eliminar plomo.**
- **Busque otras fuentes o formas de tratar el agua (agua en botellas o filtros de agua, entre otros).**
- **Analice periódicamente el plomo en su agua.**
- **Identifique y reemplace el equipo de fontanería que contenga plomo.**

Para más información
Llámenos al [insert your water system's phone number]. Para más información acerca de la reducción de exposición al plomo en su hogar y los efectos del plomo en la salud puede visitar el sitio Internet en ***www.epa.gov/lead***, llamar al centro nacional de información sobre el plomo (National Lead Information Center) marcando el 1-800-424-LEAD (424-5323) ó bien consultar a su proveedor de atención médica.

Consumer Notice of Tap Water Results Template for Community Water Systems (Spanish)

[Information in italics is required/mandatory language and cannot be changed]

[Select the appropriate number from the 6 possible options]

Estimado/a (Consumer's Name),
[Insert name of your water system] agradece su participación en el programa de monitoreo de plomo en el agua de grifo. Un nivel de [insert data from the laboratory analysis of the sample collected-make sure the value is in pbb] ha resultado de la muestra obtenida el [date], en la ubicación de [insert address of customer].

2. Su resultado se halla debajo del nivel de acción para el plomo de 15 partes por mil millones (15 ppb). No obstante, el valor de percentil 90 de nuestro sistema se halla por encima del nivel de acción para el plomo.

¿Qué significa este resultado?
Bajo la autoridad de la Ley de Agua Potable Segura, la Agencia de Protección del Medio Ambiente (Environmental Protection Agency, o EPA por sus siglas en inglés) de los Estados Unidos estableció a 15 ppb el nivel de acción para el plomo en el agua potable. Esto significa que los servicios públicos deben asegurarse que el agua de grifo de sus clientes no exceda dicho nivel en el 90 por ciento de hogares analizados (valor de percentil 90). El nivel de acción significa *una concentración de contaminante que una vez excedida provoca el tratamiento u otros requisitos que debe acatar un sistema de aguas*. Si el agua de grifo excede dicho límite, el servicio público debe entonces emprender ciertas medidas para corregir el problema. Debido a que el plomo puede conllevar serios riesgos para la salud, la EPA ha establecido un Objetivo de Nivel Máximo de Contaminante (MCLG por sus siglas en inglés) de cero para el plomo. El MCLG es *el nivel de un contaminante en el agua potable cuyo valor menor no presenta ningún riesgo conocido o previsto para la salud. Los niveles MCLG ofrecen un margen de seguridad*.

Hemos emprendido ciertas medidas para corregir este problema. Comenzaremos a tomar muestras cada 6 meses con el fin de monitorear de cerca los niveles de plomo en nuestro sistema de aguas. Su participación y apoyo continuos en nuestro programa de supervisión de agua de grifo es de gran importancia. Iniciaremos una campaña de Educación Pública que permita cerciorarse de que nuestros clientes se hallan conscientes de la excedencia en el nivel de acción de plomo, comprenden cómo el plomo afecta la salud, conocen las fuentes de plomo y saben qué acciones pueden emprender con el fin de reducir la exposición al plomo en el agua potable. También monitorearemos nuestra agua potable, estableceremos controles cuyo fin es reducir la corrosividad de nuestra agua (el agua corrosiva puede disolver el plomo de los materiales que lo contengan) e iniciaremos el reemplazo de líneas de servicio (para los sistemas cuyas líneas de servicio son de plomo).

¿Cómo afecta el plomo a la salud?
El plomo puede causar serios problemas de salud si cantidades excesivas provenientes del agua potable, u otras fuentes, se introducen en su cuerpo. Puede dañar al cerebro y a los riñones e interferir en la producción de glóbulos rojos que transportan oxígeno a todas las partes de su cuerpo. El riesgo más serio de exposición al plomo es para los infantes, los niños de baja edad y las mujeres encintas. Los científicos han conectado los efectos del plomo en el cerebro con coeficientes de inteligencia más reducidos en los niños. Niveles bajos de plomo tienen un mayor efecto en los adultos con problemas de riñón y de alta presión sanguínea que en los adultos sanos. El plomo se almacena en los huesos y puede ser dispersado más tarde en la vida. Durante el

embarazo, el bebé recibe plomo proveniente de los huesos maternos lo cual puede afectar el desarrollo de su cerebro.

¿Cuáles son las fuentes del plomo?
Las fuentes principales de la exposición al plomo para la mayoría de niños radican en la pintura con plomo que se deteriora, la tierra residencial y el polvo contaminados con plomo. La exposición al plomo es de especial importancia para la salud, especialmente para los niños de baja edad y para los infantes cuyos cuerpos crecientes tienen tendencia a absorber mayores cantidades de plomo que un adulto corriente. El plomo se halla en algunos juguetes, equipos de parques infantiles, joyas metálicas de niños y en algunas cerámicas tradicionales. Aunque los niveles de plomo en el agua potable de su hogar se hallaron debajo del nivel de acción, si siente inquietud por la exposición al plomo, se recomienda que los padres consulten a sus proveedores de atención médica acerca de un análisis de sangre para determinar cuáles son los niveles de plomo en los niños. Raramente existe plomo en el agua de fuente, sino que se introduce en el agua de grifo debido a la corrosión de los materiales de fontanería. Las casas construidas antes de 1988 suelen tener tuberías de plomo o soldaduras de plomo.

¿Qué puedo hacer para reducir la exposición al plomo en el agua de grifo?
Aunque los resultados de su análisis se hallan debajo del nivel de acción establecido por la EPA, es posible que usted desee emprender medidas que reduzcan su nivel de exposición aún más.

- **Deje correr el agua para eliminar el plomo.** Deje correr el agua unos 15 a 30 segundos, si no se ha utilizado en varias horas, para eliminar el plomo de la fontanería interior [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State approves the wording] o hasta que se enfríe o alcance una temperatura constante antes de utilizar el agua para beber o cocinar.
- **Utilice agua fría para cocinar y para preparar la fórmula para bebés.**
- **No hierva el agua para eliminar plomo.**
- **Busque otras fuentes o formas de tratar el agua (agua en botellas o filtros de agua, entre otros).**
- **Analice periódicamente el plomo en su agua.**
- **Identifique y reemplace el equipo de fontanería que contenga plomo.**

Para más información
Llámenos al [insert your water system's phone number]. Para más información acerca de la reducción de exposición al plomo en su hogar y los efectos del plomo en la salud puede visitar el sitio Internet en ***www.epa.gov/lead***, llamar al centro nacional de información sobre el plomo (National Lead Information Center) marcando el 1-800-424-LEAD (424-5323) ó bien consultar a su proveedor de atención médica.

Consumer Notice of Tap Water Results Template for Community Water Systems (Spanish)

[Information in italics is required/mandatory language and cannot be changed]

[Select the appropriate number from the 6 possible options]

Estimado/a (Consumer's Name),
[Insert name of your water system] agradece su participación en el programa de monitoreo de plomo en el agua de grifo. Un nivel de [insert data from the laboratory analysis of the sample collected-make sure the value is in pbb] ha resultado de la muestra obtenida el [date], en la ubicación de [insert address of customer].

3. Su resultado se halla por encima del nivel de acción para el plomo de 15 partes por mil millones (15 ppb). No obstante, el valor de percentil 90 de nuestro sistema se halla debajo del nivel de acción para el plomo.

¿Qué significa este resultado?
Bajo la autoridad de la Ley de Agua Potable Segura, la Agencia de Protección del Medio Ambiente (Environmental Protection Agency, o EPA por sus siglas en inglés) de los Estados Unidos estableció a 15 ppb el nivel de acción para el plomo en el agua potable. Esto significa que los servicios públicos deben asegurarse que el agua de grifo de sus clientes no exceda dicho nivel en el 90 por ciento de hogares analizados (valor de percentil 90). El nivel de acción significa *una concentración de contaminante que una vez excedida provoca el tratamiento u otros requisitos que debe acatar un sistema de aguas*. Si el agua de grifo excede dicho límite, el servicio público debe entonces emprender ciertas medidas para corregir el problema. Debido a que el plomo puede conllevar serios riesgos para la salud, la EPA ha establecido un Objetivo de Nivel Máximo de Contaminante (MCLG por sus siglas en inglés) de cero para el plomo. El MCLG es *el nivel de un contaminante en el agua potable cuyo valor menor no presenta ningún riesgo conocido o previsto para la salud. Los niveles MCLG ofrecen un margen de seguridad*.

Es posible que su nivel de plomo se deba a condiciones intrínsecas a su hogar, tales como la existencia de soldaduras de plomo o de grifos, accesorios y válvulas de latón que pueden contener plomo. Nuestro sistema se esfuerza en reducir al máximo la corrosividad de nuestra agua (el agua corrosiva puede disolver el plomo de los materiales que lo contengan) y usted puede emprender ciertas medidas para reducir la exposición.

Le aconsejamos seriamente de emprender las medidas a continuación para reducir su nivel de exposición al plomo en el agua potable.

¿Cómo afecta el plomo a la salud?
El plomo puede causar serios problemas de salud si cantidades excesivas provenientes del agua potable, u otras fuentes, se introducen en su cuerpo. Puede dañar al cerebro y a los riñones e interferir en la producción de glóbulos rojos que transportan oxígeno a todas las partes de su cuerpo. El riesgo más serio de exposición al plomo es para los infantes, los niños de baja edad y las mujeres encintas. Los científicos han conectado los efectos del plomo en el cerebro con coeficientes de inteligencia más reducidos en los niños. Niveles bajos de plomo tienen un mayor efecto en los adultos con problemas de riñón y de alta presión sanguínea que en los adultos sanos. El plomo se almacena en los huesos y puede ser dispersado más tarde en la vida. Durante el embarazo, el bebé recibe plomo proveniente de los huesos maternos lo cual puede afectar el desarrollo de su cerebro. Si la exposición al plomo le preocupa puede consultar con su proveedor de atención médica acerca de un análisis de sangre de los niños para determinar cuáles son los niveles de plomo.

¿Cuáles son las fuentes del plomo?
Aunque la mayor parte de exposición al plomo ocurre cuando la gente ingiere escamas de pintura o aspira polvo contaminado, la EPA considera que de 10 a 20 por ciento de la exposición humana al plomo puede deberse al plomo en el agua potable. Raramente existe plomo en el agua de fuente, sino que se introduce en el agua de grifo debido a la corrosión de los materiales de fontanería. Las casas construidas antes de 1988 suelen tener tuberías de plomo o soldaduras de plomo. Sin embargo, las casas nuevas también presentan riesgos: inclusive la fontanería que legalmente se halla "sin plomo" pueden contener hasta 8 por ciento de plomo. El problema más corriente radica en los grifos y accesorios de latón o de latón cromado que pueden disolver grandes cantidades de plomo en el agua, especialmente en agua caliente.

¿Qué puedo hacer para reducir la exposición al plomo en el agua de grifo?

- **Deje correr el agua para eliminar el plomo.** Deje correr el agua unos 15 a 30 segundos, si no se ha utilizado en varias horas, para eliminar el plomo de la fontanería interior [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State approves the wording] o hasta que se enfríe o alcance una temperatura constante antes de utilizar el agua para beber o cocinar.
- **Utilice agua fría para cocinar y para preparar la fórmula para bebés.** No cocine ni beba agua del grifo de agua caliente ya que el plomo se disuelve más fácilmente en agua caliente. No utilice el grifo de agua caliente para preparar la fórmula para bebés.
- **No hierva el agua para eliminar plomo.** El agua hervida no reduce el plomo.
- **Busque otras fuentes o formas de tratar el agua.** Usted puede comprar agua en botellas o un filtro de agua. Lea el embalaje y cerciórese de que el filtro se halla aprobado para reducir plomo.
- **Analice periódicamente el plomo en su agua.** Llámenos al [insert phone number for your water system] para saber cómo obtener un análisis del plomo en su agua. [Include information on your water system's testing program. For example, do you provide free testing? Are there labs in your area that are certified to do lead in water testing?]
- **Identifique y reemplace el equipo de fontanería que contenga plomo.** Los grifos, los accesorios y las válvulas de latón, inclusive las que se anuncian estar "sin plomo", pueden contribuir al plomo en el agua potable. En la actualidad la ley permite que los accesorios de uso final de latón, tales como los grifos, cuyo tenor puede tener hasta 8 por ciento de plomo, puedan etiquetarse "sin plomo". Esta ley también exige que los grifos y otros accesorios de uso final tengan una certificación independiente que cumpla con la Norma 61 NSF/ANSI. Los productos conformes se hallan marcados directamente en el producto mismo o en el embalaje.

Para más información
Llámenos al [insert your water system's phone number]. Para más información acerca de la reducción de exposición al plomo en su hogar y los efectos del plomo en la salud puede visitar el sitio Internet en ***www.epa.gov/lead***, llamar al centro nacional de información sobre el plomo (National Lead Information Center) marcando el 1-800-424-LEAD (424-5323) ó bien consultar a su proveedor de atención médica.

Consumer Notice of Tap Water Results Template for Community Water Systems (Spanish)

[Information in italics is required/mandatory language and cannot be changed]

[Select the appropriate number from the 6 possible options]

Estimado/a (Consumer's Name),
[Insert name of your water system] agradece su participación en el programa de monitoreo de plomo en el agua de grifo. Un nivel de [insert data from the laboratory analysis of the sample collected-make sure the value is in pbb] ha resultado de la muestra obtenida el [date], en la ubicación de [insert address of customer].

4. Su resultado excede el nivel de acción para el plomo y el valor de percentil 90 de nuestro sistema de aguas es también mayor del nivel de acción para el plomo de 15 parte por mil millones (15 ppb).

¿Qué significa este resultado?
Bajo la autoridad de la Ley de Agua Potable Segura, la Agencia de Protección del Medio Ambiente (Environmental Protection Agency, o EPA por sus siglas en inglés) de los Estados Unidos estableció a 15 ppb el nivel de acción para el plomo en el agua potable. Esto significa que los servicios públicos deben asegurarse que el agua de grifo de sus clientes no exceda dicho nivel en el 90 por ciento de hogares analizados (resultado de percentil 90). El nivel de acción significa *una concentración de contaminante que una vez excedida provoca el tratamiento u otros requisitos que debe acatar un sistema de aguas*. Si el agua de grifo excede dicho límite, el servicio público debe entonces emprender ciertas medidas para corregir el problema. Debido a que el plomo puede conllevar serios riesgos para la salud, la EPA ha establecido un Objetivo de Nivel Máximo de Contaminante (MCLG por sus siglas en inglés) de cero para el plomo. El MCLG es *el nivel de un contaminante en el agua potable cuyo valor menor no presenta ningún riesgo conocido o previsto para la salud. Los niveles MCLG ofrecen un margen de seguridad*.

Hemos emprendido ciertas medidas para corregir este problema. Comenzaremos a tomar muestras cada 6 meses con el fin de monitorear de cerca los niveles de plomo en nuestro sistema de aguas. Su participación y apoyo continuos en nuestro programa de supervisión de agua de grifo es de gran importancia. Iniciaremos una campaña de Educación Pública que permita cerciorarse de que nuestros clientes se hallan conscientes de la excedencia en el nivel de acción, comprenden cómo el plomo afecta la salud, conocen las fuentes de plomo y saben qué acciones pueden emprender con el fin de reducir la exposición al plomo en el agua potable. También monitorearemos nuestra agua potable, estableceremos controles cuyo fin es reducir la corrosividad de nuestra agua (el agua corrosiva puede disolver el plomo de los materiales que lo contengan) e iniciaremos el reemplazo de líneas de servicio (para los sistemas cuyas líneas de servicio son de plomo).

Aunque hemos emprendido medidas para reducir los niveles de plomo, es posible que su nivel elevado de plomo se deba a condiciones intrínsecas a su hogar, tales como la existencia de soldaduras de plomo o de grifos, accesorios y válvulas de latón que pueden contener plomo. Nuestro sistema se esfuerza en reducir al máximo la corrosividad de nuestra agua (el agua corrosiva puede disolver el plomo de los materiales que lo contengan) y usted puede emprender ciertas medidas para reducir la exposición. Le aconsejamos seriamente de emprender las medidas a continuación para reducir su nivel de exposición al plomo en el agua potable.

¿Cómo afecta el plomo a la salud?
El plomo puede causar serios problemas de salud si cantidades excesivas provenientes del agua potable, u otras fuentes, se introducen en su cuerpo. Puede dañar al cerebro y a los riñones e interferir en la producción de glóbulos rojos que transportan oxígeno a todas las partes de su cuerpo. El riesgo más serio de exposición

al plomo es para los infantes, los niños de baja edad y las mujeres encintas. Los científicos han conectado los efectos del plomo en el cerebro con coeficientes de inteligencia más reducidos en los niños. Niveles bajos de plomo tienen un mayor efecto en los adultos con problemas de riñón y de alta presión sanguínea que en los adultos sanos. El plomo se almacena en los huesos y puede ser dispersado más tarde en la vida. Durante el embarazo, el bebé recibe plomo proveniente de los huesos maternos lo cual puede afectar el desarrollo de su cerebro. Si la exposición al plomo le preocupa puede consultar con su proveedor de atención médica acerca de un análisis de sangre de los niños para determinar cuáles son los niveles de plomo.

¿Cuáles son las fuentes del plomo?

Aunque la mayor parte de exposición al plomo ocurre cuando la gente ingiere escamas de pintura o aspira polvo contaminado, la EPA considera que de 10 a 20 por ciento de la exposición humana al plomo puede deberse al plomo en el agua potable. Raramente existe plomo en el agua de fuente, sino que se introduce en el agua de grifo debido a la corrosión de los materiales de fontanería. Las casas construidas antes de 1988 suelen tener tuberías de plomo o soldaduras de plomo. Sin embargo, las casas nuevas también presentan riesgos: inclusive la fontanería que legalmente se halla “sin plomo” pueden contener hasta 8 por ciento de plomo. El problema más corriente radica en los grifos y accesorios de latón o de latón cromado que pueden disolver grandes cantidades de plomo en el agua, especialmente en agua caliente.

¿Qué puedo hacer para reducir la exposición al plomo en el agua de grifo?

- **Deje correr el agua para eliminar el plomo.** Deje correr el agua unos 15 a 30 segundos, si no se ha utilizado en varias horas, para eliminar el plomo de la fontanería interior [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State approves the wording] o hasta que se enfríe o alcance una temperatura constante antes de utilizar el agua para beber o cocinar.
- **Utilice agua fría para cocinar y para preparar la fórmula para bebés.** No cocine ni beba agua del grifo de agua caliente ya que el plomo se disuelve más fácilmente en agua caliente. No utilice el grifo de agua caliente para preparar la fórmula para bebés.
- **No hierva el agua para eliminar plomo.** El agua hervida no reduce el plomo.
- **Busque otras fuentes o formas de tratar el agua.** Usted puede comprar agua en botellas o un filtro de agua. Lea el embalaje y cerciórese de que el filtro se halla aprobado para reducir plomo.
- **Analice periódicamente el plomo en su agua.** Llámenos al [insert phone number for your water system] para saber cómo obtener un análisis del plomo en su agua. [Include information on your water system’s testing program. For example, do you provide free testing? Are there labs in your area that are certified to do lead in water testing?]
- **Identifique y reemplace el equipo de fontanería que contenga plomo.** Los grifos, los accesorios y las válvulas de latón, inclusive las que se anuncian estar “sin plomo”, pueden contribuir al plomo en el agua potable. En la actualidad la ley permite que los accesorios de uso final de latón, tales como los grifos, cuyo tenor puede tener hasta 8 por ciento de plomo, puedan etiquetarse “sin plomo”. Esta ley también exige que los grifos y otros accesorios de uso final tengan una certificación independiente que cumpla con la Norma 61 NSF/ANSI. Los productos conformes se hallan marcados directamente en el producto mismo o en el embalaje.

Para más información

Llámenos al [insert your water system’s phone number]. Para más información acerca de la reducción de exposición al plomo en su hogar y los efectos del plomo en la salud puede visitar el sitio Internet en ***www.epa.gov/lead***, llamar al centro nacional de información sobre el plomo (National Lead Information Center) marcando el 1-800-424-LEAD (424-5323) ó bien consultar a su proveedor de atención médica.

Consumer Notice of Tap Water Results Template for Community Water Systems (Spanish)

[Information in italics is required/mandatory language and cannot be changed]

[Select the appropriate number from the 6 possible options]

Estimado/a (Consumer's Name),
[Insert name or your water system] agradece su participación en el programa de monitoreo de plomo en el agua de grifo. Un nivel de [insert data from the laboratory analysis of the sample collected – make sure the value is in ppb] ha resultado de la muestra obtenida el [date], en la ubicación de [insert address of customer].

5. Su resultado se halla debajo del nivel de acción para el plomo de 15 partes por mil millones (15 ppb). No obstante, nuestro sistema de aguas todavía no ha calculado el valor de percentil 90 de nuestro sistema y todavía no sabemos si nuestro sistema se halla por encima del nivel de acción para el plomo.

¿Qué significa este resultado?
Bajo a la autoridad de la Ley de Agua Potable Segura, la Agencia de Protección del Medio Ambiente (Environmental Protection Agency, o EPA por sus siglas en inglés) de los Estados Unidos estableció a 15 partes por mil millones (ppb) el nivel de acción para el plomo en el agua potable. Esto significa que los servicios públicos deben asegurarse que el agua de grifo de sus clientes no exceda dicho nivel en el 90 por ciento de hogares analizados (valor de percentil 90). *El nivel de acción significa una concentración de contaminante que una vez excedida provoca el tratamiento u otros requisitos que debe acatar un sistema de aguas.* Si el agua de grifo excede dicho límite, el servicio público debe entonces emprender ciertas medidas para corregir el problema. Debido a que el plomo puede conllevar serios riesgos para la salud, la EPA ha establecido un Objetivo de Nivel Máximo de Contaminante (MCLG por sus siglas en inglés) de cero para el plomo. El MCLG es *el nivel de un contaminante en el agua potable cuyo valor menor no presenta ningún riesgo conocido o previsto para la salud. Los niveles MCLG ofrecen un margen de seguridad.*

Estamos en proceso de determinar el valor de percentil 90 de nuestro sistema de aguas. Usted puede llamarnos al [insert water system phone number] después de [insert date that your 90th percentile calculation information will be available] para conocer el valor percentil 90 de nuestro sistema. Si nuestro valor percentil 90 se halla debajo del nivel de acción para el plomo, no será necesario emprender medidas suplementarias y seguiremos con nuestro programa regular de monitoreo del plomo en el agua potable.

Si nuestro valor de percentil 90 se halla en excedencia del nivel de acción para el plomo existen ciertas medidas que emprenderemos para corregir este problema. Comenzaremos a tomar muestras cada 6 meses con el fin de monitorear de cerca los niveles de plomo en nuestro sistema de aguas. Su participación y apoyo continuos en nuestro programa de supervisión de agua de grifo es de gran importancia. Iniciaremos una campaña de Educación Pública que permita cerciorarse de que todos nuestros clientes se hallan conscientes de la excedencia en el nivel de acción, comprenden cómo el plomo afecta la salud, conocen las fuentes de plomo y saben qué acciones pueden emprender con el fin de reducir la exposición al plomo en el agua potable. También monitorearemos nuestra agua potable, estableceremos controles cuyo fin es reducir la corrosividad de nuestra agua (el agua corrosiva puede disolver el plomo de los materiales que lo contengan) e iniciaremos el reemplazo de líneas de servicio [for those systems with lead service lines].

¿Cómo afecta el plomo a la salud?
El plomo puede causar serios problemas de salud si cantidades excesivas provenientes del agua potable, u otras fuentes, se introducen en su cuerpo. Puede dañar al cerebro y a los riñones e interferir en la producción de glóbulos rojos que transportan oxígeno a todas las partes de su cuerpo. El riesgo más serio de exposición al plomo es para los infantes, los niños de baja edad y las mujeres encintas. Los científicos han conectado los efectos del plomo en el cerebro con coeficientes de inteligencia más reducidos en los niños. Niveles bajos de plomo tienen un mayor efecto en los adultos con problemas de riñón y de alta presión sanguínea que en los adultos sanos. El plomo se almacena en los huesos y puede ser dispersado más tarde en la vida. Durante el embarazo, el bebé recibe plomo proveniente de los huesos maternos lo cual puede afectar el desarrollo de su cerebro.

¿Cuáles son las fuentes del plomo?
Las fuentes principales de la exposición al plomo para la mayoría de niños radican en la pintura con plomo que se deteriora, la tierra residencial y el polvo contaminados con plomo. La exposición al plomo es de especial importancia para la salud, especialmente para los niños de baja edad y para los infantes cuyos cuerpos crecientes tienen tendencia a absorber mayores cantidades de plomo que un adulto corriente. Aunque los niveles de plomo en el agua potable de su hogar se hallaron debajo del nivel de acción, si siente inquietud por la exposición al plomo, se recomienda que los padres consulten a sus proveedores de atención médica acerca de un análisis de sangre para determinar cuáles son los niveles de plomo en los niños. Raramente existe plomo en el agua de fuente, sino que se introduce en el agua de grifo debido a la corrosión de los materiales de fontanería. Las casas construidas antes de 1988 suelen tener tuberías de plomo o soldaduras de plomo.

¿Qué puedo hacer para reducir la exposición al plomo en el agua de grifo?
Aunque los resultados de su análisis se hallan debajo del nivel de acción establecido por la EPA, es posible que usted desee emprender medidas que reduzcan su nivel de exposición aún más.

- **Deje correr el agua para eliminar el plomo.** Deje correr el agua unos 15 a 30 segundos, si no se ha utilizado agua en varias horas, para eliminar el plomo de la fontanería interior [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State Primacy Agency approves the wording] o hasta que se enfríe o alcance una temperatura constante antes de utilizar el agua para beber o cocinar.
- **Utilice agua fría para cocinar y para preparar la fórmula para bebés.**
- **No hierva el agua para eliminar plomo.**
- **Busque otras fuentes o formas de tratar el agua (agua en botellas o filtros de agua, entre otros).**
- **Analice periódicamente el plomo en su agua.**
- **Identifique y reemplace el equipo de fontanería que contenga plomo.**

Para más información
Llámenos al [insert your water system's phone number]. Para más información acerca de la reducción de exposición al plomo en su hogar y los efectos del plomo en la salud puede visitar el sitio Internet en ***www.epa.gov/lead***, llamar al centro nacional de información sobre el plomo (National Lead Information Center) marcando el 1-800-424-LEAD (424-5323) ó bien consultar a su proveedor de atención médica.

Consumer Notice of Tap Water Results Template for Community Water Systems (Spanish)

[Information in italics is required/mandatory language and cannot be changed]

[Select the appropriate number from the 6 possible options]

Estimado/a (Consumer's Name),
[Insert name or your water system] agradece su participación en el programa de monitoreo de plomo en el agua de grifo. Un nivel de [insert data from the laboratory analysis of the sample collected – make sure the value is in ppb] ha resultado de la muestra obtenida el [date], en la ubicación de [insert address of customer].

6. Su resultado se halla por encima del nivel de acción para el plomo de 15 partes por mil millones (ppb). No obstante, nuestro sistema de aguas todavía no ha calculado el valor de percentil 90 de nuestro sistema y todavía no sabemos si nuestro sistema se halla por encima del nivel de acción para el plomo.

¿Qué significa este resultado?
Bajo a la autoridad de la Ley de Agua Potable Segura, la Agencia de Protección del Medio Ambiente (Environmental Protection Agency, o EPA por sus siglas en inglés) de los Estados Unidos estableció a 15 partes por mil millones (ppb) el nivel de acción para el plomo en el agua potable. Esto significa que los servicios públicos deben asegurarse que el agua de grifo de sus clientes no exceda dicho nivel en el 90 por ciento de hogares analizados (valor de percentil 90). *El nivel de acción significa una concentración de contaminante que una vez excedida provoca el tratamiento u otros requisitos que debe acatar un sistema de aguas.* Si el agua de grifo excede dicho límite, el servicio público debe entonces emprender ciertas medidas para corregir el problema. Debido a que el plomo puede conllevar serios riesgos para la salud, la EPA ha establecido un Objetivo de Nivel Máximo de Contaminante (MCLG por sus siglas en inglés) de cero para el plomo. El MCLG es *el nivel de un contaminante en el agua potable cuyo valor menor no presenta ningún riesgo conocido o previsto para la salud. Los niveles MCLG ofrecen un margen de seguridad*.

Estamos en proceso de determinar el valor de percentil 90 de nuestro sistema de aguas. Usted puede llamarnos al [insert water system phone number] después de [insert date that your 90th percentile calculation information will be available] para conocer el valor percentil 90 de nuestro sistema. Si nuestro valor percentil 90 se halla debajo del nivel de acción para el plomo, no será necesario emprender medidas suplementarias y seguiremos con nuestro programa regular de monitoreo del plomo en el agua potable.

Si nuestro valor de percentil 90 se halla en excedencia del nivel de acción para el plomo existen ciertas medidas que emprenderemos para corregir este problema. Comenzaremos a tomar muestras cada 6 meses con el fin de monitorear de cerca los niveles de plomo en nuestro sistema de aguas. Su participación y apoyo continuos en nuestro programa de supervisión de agua de grifo es de gran importancia. Iniciaremos una campaña de Educación Pública que permita cerciorarse de que todos nuestros clientes se hallan conscientes de la excedencia en el nivel de acción, comprenden cómo el plomo afecta la salud, conocen las fuentes de plomo y saben qué acciones pueden emprender con el fin de reducir la exposición al plomo en el agua potable. También monitorearemos nuestra agua potable, estableceremos controles cuyo fin es reducir la corrosividad de nuestra agua (el agua corrosiva puede disolver el plomo de los materiales que lo contengan) e iniciaremos el reemplazo de líneas de servicio [for those systems with lead service lines].

Es posible que su nivel de plomo se deba a condiciones intrínsecas a su hogar, tales como la existencia de soldaduras de plomo o de grifos, accesorios y válvulas de latón que pueden contener plomo. Nuestro sistema se esfuerza en reducir al máximo la corrosividad de nuestra agua (el agua corrosiva puede disolver el plomo de los materiales que lo contengan) y usted puede emprender ciertas medidas para reducir la exposición. We strongly urge you to take the steps below to reduce your exposure to lead in drinking water Le aconsejamos seriamente de emprender las medidas a continuación para reducir su nivel de exposición al plomo en el agua potable.

¿Cómo afecta el plomo a la salud?
El plomo puede causar serios problemas de salud si cantidades excesivas provenientes del agua potable, u otras fuentes, se introducen en su cuerpo. Puede dañar al cerebro y a los riñones e interferir en la producción de glóbulos rojos que transportan oxígeno a todas las partes de su cuerpo. El riesgo más serio de exposición al plomo es para los infantes, los niños de baja edad y las mujeres encintas. Los científicos han conectado los efectos del plomo en el cerebro con coeficientes de inteligencia más reducidos en los niños. Niveles bajos de plomo tienen un mayor efecto en los adultos con problemas de riñón y de alta presión sanguínea que en los adultos sanos. El plomo se almacena en los huesos y puede ser dispersado más tarde en la vida. Durante el embarazo, el bebé recibe plomo proveniente de los huesos maternos lo cual puede afectar el desarrollo de su cerebro. Si la exposición al plomo lo preocupa puede consultar con su proveedor de atención médica acerca de un análisis de sangre de los niños para determinar cuáles son los niveles plomo.

¿Cuáles son las fuentes del plomo?
Las fuentes principales de la exposición al plomo para la mayoría de niños radican en la pintura con plomo que se deteriora, la tierra residencial y el polvo contaminados con plomo. La exposición al plomo es de especial importancia para la salud, especialmente para los niños de baja edad y para los infantes cuyos cuerpos crecientes tienen tendencia a absorber mayores cantidades de plomo que un adulto corriente. Aunque los niveles de plomo en el agua potable de su hogar se hallaron debajo del nivel de acción, si siente inquietud por la exposición al plomo, se recomienda que los padres consulten a sus proveedores de atención médica acerca de un análisis de sangre para determinar cuáles son los niveles de plomo en los niños. Raramente existe plomo en el agua de fuente, sino que se introduce en el agua de grifo debido a la corrosión de los materiales de fontanería. Las casas construidas antes de 1988 suelen tener tuberías de plomo o soldaduras de plomo.

¿Qué puedo hacer para reducir la exposición al plomo en el agua de grifo?

- **Deje correr el agua para eliminar el plomo.** Deje correr el agua unos 15 a 30 segundos, si no se ha utilizado agua en varias horas, para eliminar el plomo de la fontanería interior [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the State Primacy Agency approves the wording] o hasta que se enfríe o alcance una temperatura constante antes de utilizar el agua para beber o cocinar.
- **Utilice agua fría para cocinar y para preparar la fórmula para bebés.** No cocine ni beba agua del grifo de agua caliente ya que el plomo se disuelve fácilmente en agua caliente. No utilice el grifo de agua caliente para preparar la fórmula para bebés.
- **No hierva el agua para eliminar plomo.** El agua hervida no reduce el plomo.
- **Busque otras fuentes o formas de tratar el agua.** Usted puede comprar agua en botellas o un filtro de agua. Lea el embalaje y cerciórese de que el filtro se halla aprobado para reducir plomo.
- **Analice periódicamente el plomo en su agua.** Llámenos al [insert phone number for your water system] para saber cómo y cuándo repetir el análisis de plomo en su agua. [Include information on your water system's testing program. For example, do you provide free testing? Are there labs in your area that are

certified to do lead in water testing?]

- **Identifique y reemplace el equipo de fontanería que contenga plomo.** Los grifos, los accesorios y las válvulas de latón, inclusive las que se anuncian estar "sin plomo", pueden contribuir al plomo en el agua potable. En la actualidad la ley permite que los accesorios de uso final de latón, tales como los grifos, cuyo tenor puede tener hasta 8 por ciento de plomo, puedan etiquetarse "sin plomo". Esta ley también exige que los grifos y otros accesorios de uso final tengan una certificación independiente que cumpla con la Norma 61 NSF/ANSI. Los productos conformes se hallan marcados directamente en el producto mismo o en el embalaje.

Para más información

Llámenos al [insert your water system's phone number]. Para más información acerca de la reducción de exposición al plomo en su hogar y los efectos del plomo en la salud puede visitar el sitio Internet en ***www.epa.gov/lead***, llamar al centro nacional de información sobre el plomo (National Lead Information Center) marcando el 1-800-424-LEAD (424-5323) ó bien consultar a su proveedor de atención.

Appendix C

Contacts and Additional Resources

Federal Informational Sources

- EPA's Web site on Lead: **www.epa.gov/lead**
- EPA's Web site on Lead in Drinking Water: **www.epa.gov/safewater/lead**
- EPA's Web site on Reducing Lead in Drinking Water in Schools and Day Care Centers: **www.epa.gov/safewater/schools**.
- Centers for Disease Control and Prevention's Web site on Lead: **www.cdc.gov/lead**
- National Lead Information Center Hotline: (800) 424-LEAD
- EPA's Safe Drinking Water Hotline: (800) 426-4791

State Drinking Water and Lead Poisoning Prevention Informational Sources

State	**Lead in Drinking Water Program**	**Lead Poisoning Prevention Program**
Alabama	Alabama Department of Environmental Management, Water Supply Branch Phone: (334) 271-7700 Web site: **www.adem.state.al.us/WaterDivision/Drinking/DWMainInfo.htm**	Alabama Department of Public Health, Bureau of Family Health Services, Childhood Lead Poisoning Prevention Program Phone: (334) 206-2966 Web site: **www.adph.org/aclppp**
Alaska	Alaska Department of Environmental Conservation, Division of Environmental Health, Drinking Water and Wastewater Program Phone: (907) 269-7647 Web site: **www.dec.state.ak.us/eh/dw/**	Alaska Department of Health and Social Services, Division of Public Health, Section of Epidemiology Phone: (907) 269-8086 Web site: **www.epi.hss.state.ak.us/eh/default.stm**
Arizona	Arizona Department of Environmental Quality, Drinking Water Section Phone: (602) 771-2300 Toll-free Phone: (800) 234-5677 Web site: **www.azdeq.gov/environ/water/dw/**	Arizona Department of Health Services, Office of Environmental Health, Lead Poisoning Prevention Program Phone: (602) 364-3118 Web site: **www.azdhs.gov/phs/oeh/invsurv/lead/index.htm**
Arkansas	Arkansas Department of Health and Human Services, Division of Engineering Phone: (501) 661-2623 Web site: **http://www.healthyarkansas.com/eng/index.html**	Arkansas Department of Health, Lead Based Paint Program Phone: 501-661-2000 Web site: **www.healthyarkansas.com/faq/faq_lead.html**
California	California Department of Public Health, Division of Drinking Water and Environmental Management Phone: (916) 449-5600 Web site: **www.cdph.ca.gov/programs/Pages/ddwem.aspx**	California Department of Health Services, Childhood Lead Poisoning Prevention Branch Phone: (510) 620-5600 Web site: **www.dhs.ca.gov/childlead/**
Colorado	Colorado Department of Public Health and Environment, Water Quality Control Division Phone: (303) 692-3500 Web site: **www.cdphe.state.co.us/wq/index.html**	Colorado Department of Public Health and Environment, Lead Poisoning Prevention Phone: (303) 739-1123 Web site: **www.cdphe.state.co.us/dc/lead/index.html**
Connecticut	Connecticut Department of Public Health, Water Supplies Section Phone: (860) 509-7333 Web site: **www.dph.state.ct.us/BRS/Water/DWD.htm**	Connecticut Department of Public Health, Lead Poisoning Prevention and Control Program Phone: (860) 509-7299 Web site: **www.ct.gov/dph/cwp/view.asp?a=3140&q=387550**

Delaware	Delaware Health and Social Services, Division of Public Health, Environmental Evaluation Branch, Office of Drinking Water Phone: (302) 741-8630 Web site: **www.dhss.delaware.gov/dhss/dph/hsp/odw.html**	Delaware Health and Social Services, Division of Public Health, Office of Lead Poisoning Prevention Phone: (302) 744-4546 Web site: **www.dhss.delaware.gov/dph/hsp/lead.html**
Florida	Florida Department of Environmental Protection, Drinking Water Program Phone: (850) 245-8336 Web site: **www.dep.state.fl.us/water/drinkingwater/index.htm**	Florida Department of Health, Division of Environmental Health, Bureau of Community Environmental Health, Childhood Lead Poisoning Prevention Program Phone: (850) 245-4250 Web site: **www.doh.state.fl.us/environment/community/lead/**
Georgia	Georgia Department of Natural Resources, Environmental Protection Division, Water Resource Branch Phone: (404) 675-6232 Web site: **www.georgiaepd.org/Documents/wpb.html**	Georgia Department of Human Resources, Division of Public Health, Childhood Lead Poisoning Prevention Program Phone: (404) 463-3754 Web site: **http://health.state.ga.us/programs/lead/**
Hawaii	Hawaii Department of Health, Environmental Management Division Phone: (808) 586-4258 Web site: **www.hawaii.gov/health/environmental/water/sdwb/index.html**	Hawaii Department of Health, Maternal and Child Health Branch Phone: (808) 733-9022 Web site: **http://hawaii.gov/health/family-child-health/mchb/index.html**
Idaho	Idaho Department of Environmental Quality, Division of Environmental Quality, Drinking Water Program Phone: (208) 373-0291 Web site: **www.deq.idaho.gov/water/prog_issues/drinking_water/overview.cfm**	Idaho Division of Health and Welfare, Bureau of Community and Environmental Health, Indoor Environment Program Phone: (800) 926-2588 Web site: **www.healthandwelfare.idaho.gov/portal/alias__Rainbow/lang__en-US/tabID__3392/DesktopDefault.aspx**
Illinois	Illinois EPA, Division of Public Water Supplies Phone: (217) 785-8653 Web site: **www.epa.state.il.us/water/**	Illinois Department of Public Health, Childhood Lead Poisoning Phone: (217) 782-3517 Web site: **www.idph.state.il.us/public/hb/hblead.htm**
Indiana	Indiana Department of Environmental Management, Office of Water Quality Phone: (317) 232-8670 Web site: **www.in.gov/idem/programs/water/index.html**	Indiana Department of Health, Children's Lead Poisoning Prevention Phone: (317) 233-1325 Web site: **www.in.gov/isdh/programs/lead/index.htm**
Iowa	Iowa Department of Natural Resources, Water Supply Program Phone: (515) 725-0282 Web site: **www.iowadnr.com/water/drinking/index.html**	Iowa Department of Public Health, Bureau of Lead Poisoning Prevention Phone: (800) 972-2026 Web site: **www.idph.state.ia.us/eh/lead_poisoning_prevention.asp**
Kansas	Kansas Department of Health and Environment, Bureau of Water, Public Water Supply Section Phone: (785) 296-5500 Web site: **www.kdheks.gov/pws/**	Kansas Department of Health and Environment, Healthy Homes and Lead Hazard Prevention Program Phone: (866)-865-3233 Web site: **www.kdheks.gov/lead/**
Kentucky	Kentucky Department of Environmental Protection, Division of Water, Water Supply Branch Phone: (502) 564-3410 ext. 552 Web site: **www.water.ky.gov/dw/**	Kentucky Department of Public Health, Center for Health and Family Services, Adult and Child Health, Maternal and Child Health, Child Lead Poisoning Prevention Program Phone: (502) 564-2154 Web site: **http://chfs.ky.gov/dph/ach/mch/clppp.htm**

Louisiana	Louisiana Department of Health and Hospitals, Office of Public Health, Center for Environmental and Health Services, Safe Drinking Water Program Phone: (225) 342-9500 Web site: **www.dhh.louisiana.gov/offices/?ID=238**	Louisiana Department of Health and Hospitals, Office of Public Health, Center for Preventive Health, Genetic Diseases, Childhood Lead Poisoning Prevention Programs Phone: (504) 219-4413 Web site: **www.dhh.louisiana.gov/offices/page.asp?ID=263&Detail=6296**
Maine	Maine Department of Health and Human Services, Drinking Water Program Phone: (207) 287-2070 Web site: **www.maine.gov/dhhs/eng/water/**	Maine Department of Health and Human Services, Division of Environmental Health, Environmental and Occupational Health Programs, Childhood Lead Program Phone: (207) 287-8671 Web site: **http://maine.gov/dhhs/eohp/lead/**
Maryland	Maryland Department of the Environment, Water Supply Program Phone: (410) 537-3702 Web site: **www.mde.state.md.us/Programs/WaterPrograms/Water_Supply/index.asp**	Maryland Department of the Environment, Lead Poisoning Prevention Program Phone: (800)776-2706 Web site: **www.mde.state.md.us/programs/landprograms/leadcoordination/index.asp**
Massachusetts	Massachusetts Department of Environment, Drinking Water Program Phone: 617-292-5770 Web site: **www.mass.gov/dep/water/drinking.htm**	Massachusetts Office of Health and Human Services, Department of Public Health, Childhood Lead Poisoning Prevention Program Phone: (800) 532-9571 Web site: **www.mass.gov/?pageID=eohhs2terminal&L=5&L0=Home&L1=Government&L2=Departments+and+Divisions&L3=Department+of+Public+Health&L4=Programs+and+Services+A+-+J&sid=Eeohhs2&b=terminalcontent&f=dph_environmental_lead_g_clppp_about&csid=Eeohhs2**
Michigan	Michigan Department of Environmental Quality, Water Bureau Phone: (517) 241-1300 Web site: **www.michigan.gov/deqwater**	Michigan Department of Community Health, Childhood Lead Poisoning Prevention Program Phone: (517) 335-8885 Web site: **www.michigan.gov/mdch/0,1607,7-132-2942_4911_4913---,00.html**
Minnesota	Minnesota Department of Health, Drinking Water Protection Section Phone: (651) 201-4700 Web site: **www.health.state.mn.us/divs/eh/water/index.html**	Minnesota Department of Health, Lead Poisoning Prevention Phone: (651) 201-4620 Web site: **www.health.state.mn.us/divs/eh/lead/index.html**
Mississippi	Mississippi State Department of Health, Water Supply Division Phone: (601) 576-7518 Web site: **www.msdh.state.ms.us/msdhsite/_static/44,0,76.html**	Mississippi State Department of Health, Childhood Lead Poisoning Prevention Program Phone: (601) 576-7447 Web site: **www.msdh.state.ms.us/msdhsite/_static/41,0,176.html**
Missouri	Missouri Department of Natural Resources, Division of Environmental Quality, Public Drinking Water Branch Phone: (800) 361-4827 Website: **www.dnr.mo.gov/env/wpp/dw-index.htm**	Missouri Department of Health and Senior Services, Childhood Lead Poisoning Prevention Program Phone: (573) 526-4911 Web site: **www.dhss.mo.gov/ChildhoodLead/**
Montana	Montana Department of Environmental Quality, Public Water Supply Program Phone: (406) 444-4400 Web site: **www.deq.state.mt.us/wqinfo/pws/index.asp**	Montana Department of Public Health and Human Services, Lead Program Phone: (406) 444-5622 Web site: **www.dphhs.mt.gov/epht/lead.shtml**

Nebraska	Nebraska Department of Health and Human Services, Environmental Health Services Section, Public Water Supply Program Phone: (402) 471-2306 Web site: **www.hhs.state.ne.us/enh/pwsindex.htm**	Nebraska Department of Health and Human Services, Lead-Based Paint Program Phone: (402) 471-0386 Web site: **www.dhhs.ne.gov/puh/enh/leadpaint/leadindex.htm**
Nevada	Nevada Bureau of Health Protection Services, Division of Environmental Protection, Bureau of Safe Drinking Water Phone: (775) 687-9520 Web site: **http://ndep.nv.gov/bsdw/index.htm**	Southern Nevada Health District, Childhood Lead Poisoning Prevention Program Phone: (702) 759-1000 Web site: **www.southernnevadahealthdistrict.org/clppp/index.htm**
New Hampshire	New Hampshire Department of Environmental Services, Drinking Water and Ground Water Bureau, Drinking Water Source Protection Program Phone: (603) 271-3503 Web site: **www.des.state.nh.us/dwspp**	New Hampshire Department of Health and Human Services, Childhood Lead Poisoning Prevention Program Phone: (603) 271-4507 Web site: **www.dhhs.state.nh.us/DHHS/CLPPP/default.htm**
New Jersey	New Jersey Department of Environmental Protection, Division of Water Supply, Bureau of Safe Drinking Water Phone: (609)292-5550 Web site: **www.state.nj.us/dep/watersupply/safedrnk.htm**	New Jersey Department of Health and Senior Services, Family Health Services, Childhood Lead Prevention Program Phone: (609) 292-7837 Web site: **www.state.nj.us/health/fhs/newborn/lead.shtml**
New Mexico	New Mexico Environmental Department, Drinking Water Bureau Phone: (877) 654-8720 (Toll-free) Web site: **www.nmenv.state.nm.us/dwb/dwbtop.html**	New Mexico Department of Health, Environmental Health Epidemiology Bureau, Lead Poisoning Prevention Program Phone: (888) 878-8992 Web site: **www.health.state.nm.us/eheb/lead.html**
New York	New York Department of Health, Drinking Water Protection Program Phone: (800) 458-1158 Web site: **http://health.state.ny.us/environmental/lead/leadwtr.htm**	New York Department of Health, Bureau of Child and Adolescent Health, Lead Program Phone: (518) 474-2084 **Web site: www.nyhealth.gov/environmental/lead/**
North Carolina	North Carolina Department of the Environment and Natural Resources, Public Water Supply Section Phone: (919) 733-2321 Web site: **www.deh.enr.state.nc.us/pws/index.htm**	North Carolina Department of Environment and Natural Resources, Children's Environmental Health Branch, Childhood Lead Poisoning Prevention Phone: (919) 715-5237 Web site: **www.deh.enr.state.nc.us/ehs/Children_Health/Lead/lead.html**
North Dakota	North Dakota Department of Health, Drinking Water Program Phone: (701) 328-5211 Web site: **www.health.state.nd.us/MF/dw.html**	North Dakota Department of Health, Lead Based Paint Phone: (701) 328.5188 Web site: **www.health.state.nd.us/aq/iaq/lbp/index.htm**
Ohio	Ohio EPA, Division of Drinking and Ground Waters Phone: (614) 644-2752 Web site: **www.epa.state.oh.us/ddagw/**	Ohio Department of Health, Lead Poisoning Prevention Phone: (877) 668-5323 Web site: **www.odh.ohio.gov/odhPrograms/dspc/lp_prev/lp_prev1.aspx**
Oklahoma	Oklahoma Department of Environmental Quality, Water Quality Division Phone: (405) 702-8100 Web site: **www.deq.state.ok.us/WQDNew/**	Oklahoma Department of Health, Childhood Lead Poisoning Prevention Program Phone: (405) 271-6617 Web site: **www.ok.gov/health/Child_and_Family_Health/Screening,_Special_Services_and_Sooner_Start/Oklahoma_Childhood_Lead_Poisoning_Prevention_Program/index.html**

Oregon	Oregon Department of Human Services, Public Health Division, Drinking Water Program Phone: (971) 673-0405 Web site: **www.oregon.gov/DHS/ph/dwp/**	Oregon Department of Human Services, Public Health Division, Lead Poisoning Prevention Program Phone: (971) 673-0440 Web site: **www.oregon.gov/DHS/ph/lead/index.shtml**
Pennsylvania	Pennsylvania Department of Environmental Protection, Bureau of Water Supply and Wastewater Management Phone: (717) 787-9637 Web site: **www.depweb.state.pa.us/watersupply/cwp/view.asp?a=1251&Q=448745&watersupplyNav=|30131|**	Pennsylvania Department of Health, Lead Poisoning Prevention and Control Program Phone: (800) 440-5323 Web site: **www.dsf.health.state.pa.us/health/cwp/view.asp?a=179&q=201197**
Puerto Rico	Puerto Rico Department of Health, Water Supply Supervision Program Phone: (787) 767 – 8181 Web site: **www.salud.gov.pr/Pages/default.aspx**	Puerto Rico Department of Health Phone: (787) 274-7676 Web site: **www.salud.gov.pr/Pages/default.aspx**
Rhode Island	Rhode Island Department of Health, Office of Drinking Water Quality Phone: (401) 222-6867 Web site: **www.health.state.ri.us/environment/dwq/index.php**	Rhode Island Department of Health, Childhood Lead Poisoning Prevention Program Phone: (800) 942-7434 Web site: **www.health.state.ri.us/lead/index.php**
South Carolina	South Carolina Department of Health and Environmental Control, Bureau of Water Phone: (803) 898-4300 Web site: **www.scdhec.net/water/html/dwater.html**	South Carolina Department of Health and Environmental Control, Women's and Children's Services, Childhood Lead Poisoning Prevention Program Phone: (866) 466-5323 Web site: **www.scdhec.gov/health/mch/wcs/ch/lead.htm**
South Dakota	South Dakota Department of Environment and Natural Resources, Drinking Water Program Phone: (605) 773-3754 Web site: **www.state.sd.us/DENR/des/drinking/dwprg.htm**	EPA Region 8 Lead Program Phone: (303) 312-6966 Web site: **www.epa.gov/region8/toxics_pesticides/leadpnt/index.html**
Tennessee	Tennessee Department of Environment and Conservation, Division of Water Supply Phone: (615) 532-0191 Web site: **www.state.tn.us/environment/dws/**	Tennessee Department of Health, Childhood Lead Poisoning Prevention Program Phone: (615) 741-7305 Web site: **http://health.state.tn.us/lead/index.htm**
Texas	Texas Commission on Environmental Quality, Drinking Water and Water Availability Phone: (512) 239-4691 Web site: **www.tceq.state.tx.us/nav/util_water/**	Texas Department of State Health Services, Childhood Lead Poisoning Prevention Program Phone: (800) 588-1248 Web site: **www.dshs.state.tx.us/lead/default.shtm**
Utah	Utah Department of Environmental Quality, Division of Drinking Water Phone: (801) 536-4200 Web site: **www.drinkingwater.utah.gov/**	Utah Department of Environmental Quality, Office of Epidemiology, Child Blood Lead Epidemiology and Surveillance Phone: (801) 538-6191 Web site: **http://health.utah.gov/epi/enviroepi/ables98/child.htm**
Vermont	Vermont Department of Environmental Conservation, Water Supply Division Phone: 802-241-3400 Toll-free: 800-823-6500 Website: **www.vermontdrinkingwater.org/**	Vermont Department of Health, Health Protection Division, Lead Surveillance Program Phone: (802) 865-7786 Web site: **http://healthvermont.gov/enviro/lead/lead.aspx**
Virginia	Virginia Department of Health, Office of Drinking Water Phone: (804) 864-7500 Web site: **www.vdh.virginia.gov/DrinkingWater/Consumer/**	Virginia Department of Health, Office of Family Health Services, Childhood Lead Poisoning Prevention Program Phone: (804) 864-7694 Web site: **www.vahealth.org/leadsafe/**

Washington, DC	DC Department of Health, Environmental Health Administration, Water Quality Division Phone: (202) 535-2190 Web site: **http://doh.dc.gov/doh/cwp/view,a,1374,Q,586624,dohNav_GID,1811,.asp** EPA Web site on Lead in DC Drinking Water: **http://www.epa.gov/dclead/**	DC Department of Health, Lead Poisoning Prevention Program Phone: (202) 442-9216 Web site: **http://doh.dc.gov/doh/site/default.asp**
Washington	Washington Department of Health, Division of Environmental Health, Office of Drinking Water Phone: (360) 236-3100 Web site: **www.doh.wa.gov/ehp/dw/**	Washington Department of Health, Division of Environmental Health, Office of Environmental Health Assessments Phone: (800) 909-9898 Web site: **www.doh.wa.gov/ehp/lead/default.htm**
West Virginia	West Virginia Department of Health and Human Services, Environmental Engineering Division Phone: (304)558-6715 Web site: **www.wvdhhr.org/oehs/eed/**	West Virginia Department of Health and Human Services, Bureau of Public Health, Radiation, Toxics, and Air Division Phone: (304) 558-6716 Web site: **www.wvdhhr.org/rtia/lead.asp**
Wisconsin	Wisconsin Department of Natural Resources, Bureau of Drinking Water and Groundwater Phone: (608) 266-2621 Web site: **www.dnr.state.wi.us/org/water/dwg/**	Wisconsin Department of Health and Family Services, Lead-Safe Wisconsin Phone: (608) 261-6876 Web site: **www.dhfs.state.wi.us/lead/**
Wyoming	U.S. EPA Region 8 Drinking Water Program Phone: (303) 312-6337 Web site: **http://epa.gov/region8/water/dwhome/wycon.html**	Wyoming Department of Health, Preventive Health and Safety Division, Lead Poisoning Prevention Program Phone: (307) 777-6015 Web site: **http://wdh.state.wy.us/PHSD/lead/index.html**

Resources to Locate Organizations in Your Service Area

For a list of organizations in your service area, waters systems should consult with their local public health agency first, as they may have lists of the following organizations in your area. However, the Web sites below have directories where you can input your location to find surrounding organizations.

- Local Public Health Agencies
  Contact your state or local county government
  National Association of County and City Health Officials, Local Public Health Agency Index
  http://lhadirectory.naccho.org/phdir/
- Public and Private Schools or School Boards
  US Department of Education, Institute for Education Sciences, National Center for Education Statistics
  http://nces.ed.gov/globallocator/
- Women, Infants, and Children (WIC) and Head Start programs
  US Department of Agriculture, Food and Nutrition Service, WIC State Agency Contacts
  www.fns.usda.gov/wic/Contacts/ContactsMenu.HTM
  US Department of Health and Human Services, Head Start Locator
  http://eclkc.ohs.acf.hhs.gov/hslc/HeadStartOffices
- Public and Private Hospitals and Medical clinics
  Contact your local health agency
- Pediatricians
  American Academy of Pediatrics Referral Service **www.aap.org/referral/**
  American Board of Pediatrics **www.abp.org/ABPWebSite/**
- Family Planning Clinics
  Contact your local health agency
- Local Welfare Agencies
  Contact your local health agency
- Licensed childcare centers
  National Child Care Association **www.nccanet.org**
- Public and private preschools
  US Department of Education, Institute for Education Sciences, National Center for Education Statistics
  http://nces.ed.gov/globallocator/
- Obstetricians-Gynecologists and Midwives
  American College of Obstetricians and Gynecologists, Physician Lookup
  www.acog.org/member-lookup/
  American College of Nurse-Midwives **www.midwife.org/find.cfm**

Publications

Regulatory Publications

Environmental Protection Agency, 40 CFR 141 and 142 – Drinking Water Regulations; Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper; Final Rule (72 FR 57782, October 10,2007). This Federal Register Notice and further information is available at http://www.epa.gov/safewater/lcrmr/index.html.

Guidance Documents

"Lead and Copper Rule: Revised Quick Reference Guide for Schools and Child Care Facilities that are Regulated Under the Safe Drinking Water Act." US Environmental Protection Agency, Office of Water, Washington, DC. October 2005, EPA 816-F-05-030. This document is available at http://www.epa.gov/safewater/schools/.

"Lead and Copper Rule: Revised Quick Reference Guide." US Environmental Protection Agency, Office of Water, Washington, DC. June 2008, EPA 816-F-08-018. This document is available at http://www.epa.gov/safewater/lcrmr/.

"How to Determine Compliance with Optimal Water Quality Parameters as Revised by the Lead and Copper Rule Minor Revisions." US Environmental Protection Agency, Office of Water, Washington, DC. February 2001, EPA 815-R-99-019. This document is available at http://www.epa.gov/safewater/lcrmr/.

Risk Communications

"AWWA Public Communications Toolkit." American Water Works Association." This document is available at http://www.awwa.org/Government/Content.cfm?ItemNumber=3851&navItemNumber=3852.

Public Information and Fact Sheets

"Water Health Series: Filtration Facts." US Environmental Protection Agency, Office of Water, Washington, DC. September 2005, 816-K-05-002. This document is available at http://www.epa.gov/safewater/.

"Is There Lead in my Drinking Water?: You can Reduce the Risk of Lead Exposure from Drinking Water" US Environmental Protection Agency, Office of Water, Washington, DC. February 2005, EPA 816-F-05-001. This document is available in English and Spanish at ***http://www.epa.gov/safewater/lead/leadfactsheet.html***.

"Controlling Lead in Drinking Water for Schools and Day Care Facilities: A Summary of State Programs." US Environmental Protection Agency, Office of Water, Washington, DC. July 2004, EPA-810-R-04-001. This document is available at ***http://www.epa.gov/safewater/lcrmr/***.

"Tap Into Prevention: Drinking Water Information for Health Care Providers." US Environmental Protection Agency, Office of Water, Washington, DC. August 2004, EPA 816-C-04-001. This video is available in DVD and VHS format at http://www.epa.gov/safewater/healthcare/index.html.

"Water on Tap: What you Need to Know." US Environmental Protection Agency, Office of Water, Washington, DC. October 2003, EPA 816-K-03-007. This document is available in English, Spanish and Chinese at http://www.epa.gov/safewater/wot/index.html.

"Is There Lead in the Drinking Water?: You Can Reduce the Risk of Lead Exposure from Drinking Water in Educational Facilities" US Environmental Protection Agency, Office of Water, Washington DC. April 2002, 903-F01-002. This document is available at http://www.epa.gov/safewater/lead/.

"Is There Lead in My Drinking Water?: You Can Reduce the Risk of Lead Exposure from Drinking Water in Your Home." US Environmental Protection Agency, Office of Water, Washington, DC. February 2005, EPA 816-F-05-001. This document is available at http://www.epa.gov/ogwdw/lead/leadfactsheet.html.

"Drinking Water from Household Wells." US Environmental Protection Agency, Office of Water, Washington, DC. January 2002, EPA 816-K-02-003. This document is available at http://www.epa.gov/safewater/privatewells/booklet/index.html.

"Lead and Copper Rule: Short-Term Revisions and Clarifications Training." US Environmental Protection Agency, Drinking Water Academy, Washington, DC. April 2008. This presentation is available at http://www.epa.gov/safewater/lcrmr/.

"Children and Drinking Water Standards." US Environmental Protection Agency, Office of Water, Washington, DC. December 1999, 815-K-99-001. This document is available at http://www.epa.gov/safewater/kids/kidshealth/.

"Drinking Water and Health: What You Need to Know!" US Environmental Protection Agency, Office of Water, Washington, DC. October 1999, EPA 816-K-99-001. This document is available in English and Spanish at http://www.epa.gov/safewater/dwh/index.html.

CDC Publications

"Preventing Lead Poisoning in Young Children." Center for Disease Control and Prevention, Atlanta, GA. August 2005. This document is available at http://www.cdc.gov/nceh/lead/publications/pub_Reas.htm.

"Managing Elevated Blood Lead Levels Among Young Children: Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention." Center for Disease Control and Prevention, Atlanta, GA. March 2002. This document is available at http://www.cdc.gov/nceh/lead/CaseManagement/caseManage_main.htm.

Appendix D

Lead and Copper Rule Public Education Requirements—Federal Regulatory Language

Lead and Copper Rule Short-Term Revisions and Clarifications that Relate to Public Education Requirements

§141.85 Public education and supplemental monitoring requirements.

All water systems must deliver a consumer notice of lead tap water monitoring results to persons served by the water system at sites that are tested, as specified in paragraph (d) of this section. A water system that exceeds the lead action level based on tap water samples collected in accordance with §141.86 shall deliver the public education materials contained in paragraph (a) of this section in accordance with the requirements in paragraph (b) of this section. Water systems that exceed the lead action level must sample the tap water of any customer who requests it in accordance with paragraph (c) of this section.

(a) Content of written public education materials.

(1) Community water systems and Non-transient non-community water systems. Water systems must include the following elements in printed materials (e.g., brochures and pamphlets) in the same order as listed below. In addition, paragraphs (a)(1)(i) through (ii) and (a)(1)(vi) must be included in the materials, exactly as written, except for the text in brackets in these paragraphs for which the water system must include system-specific information. Any additional information presented by a water system must be consistent with the information below and be in plain language that can be understood by the general public. Water systems must submit all written public education materials to the State prior to delivery. The State may require the system to obtain approval of the content of written public materials prior to delivery.

(i) IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER. [INSERT NAME OF WATER SYSTEM] found elevated levels of lead in drinking water in some homes/buildings. Lead can cause serious health problems, especially for pregnant women and young children. Please read this information closely to see what you can do to reduce lead in your drinking water.

(ii) Health effects of lead. Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

(iii) Sources of Lead.
- (A) Explain what lead is.
- (B) Explain possible sources of lead in drinking water and how lead enters drinking water. Include information on home/building plumbing materials and service lines that may contain lead.
- (C) Discuss other important sources of lead exposure in addition to drinking water (e.g., paint).

(iv) Discuss the steps the consumer can take to reduce their exposure to lead in drinking water.

(A) Encourage running the water to flush out the lead.

(B) Explain concerns with using hot water from the tap and specifically caution against the use of hot water for preparing baby formula.

(C) Explain that boiling water does not reduce lead levels.

(D) Discuss other options consumers can take to reduce exposure to lead in drinking water, such as alternative sources or treatment of water.

(E) Suggest that parents have their child's blood tested for lead.

(v) Explain why there are elevated levels of lead in the system's drinking water (if known) and what the water system is doing to reduce the lead levels in homes/buildings in this area.

(vi) For more information, call us at [INSERT YOUR NUMBER] [(IF APPLICABLE), or visit our Web site at [INSERT YOUR WEB SITE HERE]]. For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's Web site at http://***www.epa.gov/lead*** or contact your health care provider.

(2) Community water systems. In addition to including the elements specified in paragraph (a)(1) of this section, community water systems must:

(i) Tell consumers how to get their water tested.

(ii) Discuss lead in plumbing components and the difference between low lead and lead free.

(b) Delivery of public education materials.

(1) For public water systems serving a large proportion of non-English speaking consumers, as determined by the State, the public education materials must contain information in the appropriate language(s) regarding the importance of the notice or contain a telephone number or address where persons served may contact the water system to obtain a translated copy of the public education materials or to request assistance in the appropriate language.

(2) A community water system that exceeds the lead action level on the basis of tap water samples collected in accordance with §141.86, and that is not already conducting public education tasks under this section, must conduct the public education tasks under this section within 60 days after the end of the monitoring period in which the exceedance occurred:

(i) Deliver printed materials meeting the content requirements of paragraph (a) of this section to all bill paying customers.

(ii) (A) Contact customers who are most at risk by delivering education materials that meet the content requirements of paragraph (a) of this section to local public health agencies even if they are not located within the water system's service area, along with an informational notice that encourages distribution to all the organization's potentially affected customers or community water system's users. The water system must contact the local public health agencies directly by phone or in person. The local public health agencies may provide a specific list of additional community based organizations serving target populations, which may include organizations outside the service area of the water system. If such lists are provided, systems must deliver education materials that meet the content requirements of paragraph (a) of this section to all organizations on the provided lists.

(B) Contact customers who are most at risk by delivering materials that meet the content requirements of paragraph (a) of this section to the following organizations listed in 1 through 6 that are located within the water system's service area, along with an informational notice that encourages distribution to all the organization's potentially affected customers or community water system's users:

(1) Public and private schools or school boards.
(2) Women Infants and Children (WIC) and Head Start programs.
(3) Public and private hospitals and medical clinics.
(4) Pediatricians.
(5) Family planning clinics.
(6) Local welfare agencies.

(C) Make a good faith effort to locate the following organizations within the service area and deliver materials that meet the content requirements of paragraph (a) of this section to them, along with an informational notice that encourages distribution to all potentially affected customers or users. The good faith effort to contact at-risk customers may include requesting a specific contact list of these organizations from the local public health agencies, even if the agencies are not located within the water system's service area:

(1) Licensed childcare centers
(2) Public and private preschools.
(3) Obstetricians-Gynecologists and Midwives.

(iii) No less often than quarterly, provide information on or in each water bill as long as the system exceeds the action level for lead. The message on the water bill must include the following statement exactly as written except for the text in brackets for which the water system must include system-specific information: [INSERT NAME OF WATER SYSTEM] found high levels of lead in drinking water in some homes. Lead can cause serious health problems. For more information please call [INSERT NAME OF WATER SYSTEM] [or visit (INSERT YOUR WEB SITE HERE)]. The message or delivery mechanism can be modified in consultation with the State; specifically, the State may allow a separate mailing of public education materials to customers if the water system cannot place the information on water bills.

(iv) Post material meeting the content requirements of paragraph (a) of this section on the water system's Web site if the system serves a population greater than 100,000.

(v) Submit a press release to newspaper, television and radio stations.

(vi) In addition to paragraphs (b)(2)(i) through (v) of this section, systems must implement at least three activities from one or more categories listed below. The educational content and selection of these activities must be determined in consultation with the State.

(A) Public Service Announcements.
(B) Paid advertisements.
(C) Public Area Information Displays.
(D) Emails to customers.
(E) Public Meetings.
(F) Household Deliveries.
(G) Targeted Individual Customer Contact.
(H) Direct material distribution to all multi-family homes and institutions.
(I) Other methods approved by the State.

(vii) For systems that are required to conduct monitoring annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or, if the State has established an alternate monitoring period, the last day of that period.

(3) As long as a community water system exceeds the action level, it must repeat the activities pursuant to paragraph (b)(2) of this section as described in paragraphs (b)(3)(i) through (iv) of this section.

(i) A community water system shall repeat the tasks contained in paragraphs (b)(2)(i), (ii) and (vi) of this section every 12 months.

(ii) A community water system shall repeat tasks contained in paragraph (b)(2)(iii) of this section with each billing cycle.

(iii) A community water system serving a population greater than 100,000 shall post and retain material on a publicly accessible Web site pursuant to paragraph (b)(2)(iv) of this section.

(iv) The community water system shall repeat the task in paragraph (b)(2)(v) of this section twice every 12 months on a schedule agreed upon with the State. The State can allow activities in paragraph (b)(2) of this section to extend beyond the 60-day requirement if needed for implementation purposes on a case-by-case basis; however, this extension must be approved in writing by the State in advance of the 60-day deadline.

(4) Within 60 days after the end of the monitoring period in which the exceedance occurred (unless it already is repeating public education tasks pursuant to paragraph (b)(5) of this section), a non-transient non-community water system shall deliver the public education materials specified by paragraph (a) of this section as follows:

(i) Post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system; and

(ii) Distribute informational pamphlets and/or brochures on lead in drinking water to each person served by the non-transient non-community water system. The State may allow the system to utilize electronic transmission in lieu of or combined with printed materials as long as it achieves at least the same coverage.

(iii) For systems that are required to conduct monitoring annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or, if the State has established an alternate monitoring period, the last day of that period.

(5) A non-transient non-community water system shall repeat the tasks contained in paragraph (b)(4) of this section at least once during each calendar year in which the system exceeds the lead action level. The State can allow activities in (b)(4) of this section to extend beyond the 60-day requirement if needed for implementation purposes on a case-by-case basis; however, this extension must be approved in writing by the State in advance of the 60-day deadline.

(6) A water system may discontinue delivery of public education materials if the system has met the lead action level during the most recent six-month monitoring period conducted pursuant to §141.86. Such a system shall recommence public education in accordance with this section if it subsequently exceeds the lead action level during any monitoring period.

(7) A community water system may apply to the State, in writing, (unless the State has waived the requirement for prior State approval) to use only the text specified in paragraph (a)(1) of this section in lieu of the text in paragraphs (a)(1) and (a)(2) of this section and to perform the tasks listed in paragraphs (b)(4) and (b)(5) of this section in lieu of the tasks in paragraphs (b)(2) and (b)(3) of this section if:

(i) The system is a facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices; and

(ii) The system provides water as part of the cost of services provided and does not separately charge for water consumption.

(8) A community water system serving 3,300 or fewer people may limit certain aspects of their public education programs as follows:

(i) With respect to the requirements of paragraph (b)(2)(vi) of this section, a system serving 3,300 or fewer must implement at least one of the activities listed in that paragraph.

(ii) With respect to the requirements of paragraph (b)(2)(ii) of this section, a system serving 3,300 or fewer people may limit the distribution of the public education materials required under that paragraph to facilities and organizations served by the system that are most likely to be visited regularly by pregnant women and children.

(iii) With respect to the requirements of paragraph (b)(2)(v) of this section, the State may waive this requirement for systems serving 3,300 or fewer persons as long as system distributes notices to every household served by the system.

(c) Supplemental monitoring and notification of results.

A water system that fails to meet the lead action level on the basis of tap samples collected in accordance with §141.86 shall offer to sample the tap water of any customer who requests it. The system is not required to pay for collecting or analyzing the sample, nor is the system required to collect and analyze the sample itself.

(d) Notification of results.

(1) Reporting requirement. All water systems must provide a notice of the individual tap results from lead tap water monitoring carried out under the requirements of §141.86 to the persons served by the water

system at the specific sampling site from which the sample was taken (e.g., the occupants of the residence where the tap was tested).

(2) Timing of notification. A water system must provide the consumer notice as soon as practical, but no later than 30 days after the system learns of the tap monitoring results.

(3) Content. The consumer notice must include the results of lead tap water monitoring for the tap that was tested, an explanation of the health effects of lead, list steps consumers can take to reduce exposure to lead in drinking water and contact information for the water utility. The notice must also provide the maximum contaminant level goal and the action level for lead and the definitions for these two terms from §141.153(c).

(4) Delivery. The consumer notice must be provided to persons served at the tap that was tested, either by mail or by another method approved by the State. For example, upon approval by the State, a non-transient non-community water system could post the results on a bulletin board in the facility to allow users to review the information. The system must provide the notice to customers at sample taps tested, including consumers who do not receive water bills.

Section 141.90 Reporting Requirements

(f)(1) Any water system that is subject to the public education requirements in Sec. 141.85 shall, within 10 days after the end of each period in which the system is required to perform public education in accordance with Sec. 141.85 (b), send written documentation to the State that contains:

(i) A demonstration that the system has delivered the public education materials that meet the content requirements in Sec. 141.85 (a) and the delivery requirements in Sec. 141.85 (b); and

(3) No later than 3 months following the end of the monitoring period, each system must mail a sample copy of the consumer notification results to the State along with a certification that the notification has been distributed in a manner consistent with the requirements of Sec. 141.85 (d).

Lead and Copper Rule Short-Term Revisions and Clarifications that Relate to Consumer Confidence Reports (CCR)

§141.154 Required additional health information.

(d) Every report must include the following lead-specific information:

(1) A short informational statement about lead in drinking water and its effects on children. The statement must include the following information:

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. [NAME OF UTILITY] is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

(2) A system may write its own educational statement, but only in consultation with the State.

Appendix E

Lead and Copper CWS

Public Education Fact Sheet

United States Environmental Protection Agency

Lead and Copper Rule: Public Education & Other Public Information Requirements for Community Water Systems

Public Education Requirements

Utilities must ensure that water from the customer's tap does not exceed the action level for lead in drinking water (15 ppb) in at least 90 percent of the homes sampled. If you have a **lead action level exceedance** you must complete the following steps to comply with the Lead and Copper Rule (LCR) public education (PE) requirements.

Section 141.85 of the LCR regulations contains specific requirements regarding the content and delivery of your public education program. To learn more about the revisions to the public education requirements, refer to *Implementing the Lead Public Education Provision of the Lead and Copper Rule: A Guide for Community Water Systems*, Section 1, page 5.

Step 1: Develop the content of your written public education materials.

The following information must be included in your PE materials. The text in *italics* is mandatory and must be included as written. Headings in **bold** must be addressed, but can be customized. Fill-in-the-blank templates (in English and Spanish) are available at: **www.epa.gov/safewater/lcrmr/compliancehelp.html**. More information can be found in *Implementing the Lead Public Education Provision of the Lead and Copper Rule: A Guide for Community Water Systems*; Section 1, page 8: Required Content of Public Education Materials and Appendix B: Public Education templates.

Table 1. Required Content and Language for Public Education Materials

Section	Language
Informational Statement * Mandatory language	*Important Information about Lead in Your Drinking Water* *[Insert name of water system] found elevated levels of lead in drinking water in some homes/buildings. Lead can cause serious health problems, especially for pregnant women and young children. Please read this information closely to see what you can do to reduce lead in your drinking water.*
Health Effects of Lead * Mandatory language	*Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.*
Sources of Lead * Can be customized; Example language	Lead is a common metal found in the environment. The main sources of lead exposure are lead-based paint and lead-contaminated dust or soil, and some plumbing materials. In addition, lead can be found in certain types of pottery, pewter, brass fixtures, food, and cosmetics. Other sources include exposure in the work place and exposure from certain hobbies (lead can be carried on clothing or shoes). Brass faucets, fittings, and valves, including those advertised as "lead-free," may contribute lead to drinking water. EPA estimates that 10 to 20 percent of a person's potential exposure to lead may come from drinking water. Infants who consume mostly formula mixed with lead-containing water can receive 40 to 60 percent of their exposure to lead from drinking water.

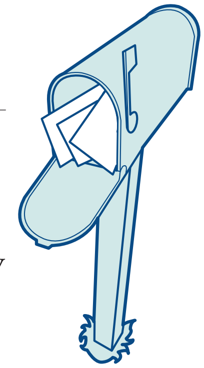
Table 1. Required Content and Language for Public Education Materials (continued)	
Section	**Language**
Steps you can take to reduce your exposure to lead in your water * Can be customized; Example language	**1. Run your water to flush out lead.** Run water for 15 - 30 seconds to flush lead from interior plumbing [or insert a different flushing time if your system has representative data indicating a different flushing time would better reduce lead exposure in your community and if the Primacy Agency approves the wording] or until it becomes cold or reaches a steady temperature before using it for drinking or cooking, if it hasn't been used for several hours. [It is likely that systems with lead service lines will need to collect data to determine the appropriate flushing time for lead service lines.][1] **2. Use cold water for cooking and preparing baby formula.** Lead dissolves more easily into hot water. **3. Do not boil water to remove lead.** Boiling water will not reduce lead. **4. Look for alternative sources or treatment of water.** You may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010 or www.nsf.org for information on performance standards for water filters. **5. Test your water for lead.** Call us at [insert phone number for your water system] to find out how to get your water tested for lead. [Include information on your water system's testing program. For example, do you provide free testing? Are there labs in your area that are certified to do lead in water testing?] **6. Get your child's blood tested.** Contact your local health department or healthcare provider to find out how you can get your child tested for lead, if you are concerned about exposure. **7. Identify and replace plumbing fixtures containing lead.** Brass faucets, fittings, and valves, including those advertised as "lead-free," may contribute lead to drinking water. The law currently allows end-use brass fixtures, such as faucets, with up to 8% lead to be labeled as "lead free." Visit the NSF Web site at www.nsf.org to learn more about lead-containing plumbing fixtures.
What happened? What is being done? * Can be customized; Example language	[Insert information about how and when the exceedance was discovered in your community and provide information on the source(s) of lead in the drinking water, if known.] [Insert information about what your system is doing to reduce lead levels in homes in your community.]
For More Information * Mandatory language	*Call us at [Insert Number] or (if applicable) visit our Web site at [insert Web site Here]. For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's Web site at www.epa.gov/lead, or contact your health care provider.* [We recommend you include the name of your system and the date that the information is being distributed, along with the state water system ID, somewhere on the notice.]

[1]The bracketed language does not need to be included, as worded, in your materials. It is designed to alert systems that, where applicable, lead service lines might affect the flushing time.

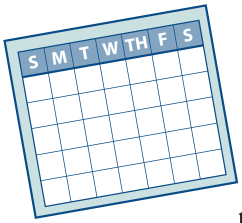
Different Language Communities. If significant proportions of the population in your community speak languages other than English, the PE materials must contain information in the appropriate language(s) regarding the importance of the notice or a contact where persons can obtain a translation or assistance.

Step 2: Get State approval.

You must submit all written PE materials to the Primacy Agency prior to delivery. The Primacy Agency may require you to obtain approval of PE materials prior to delivery.



Step 3: Deliver your public education materials.



Timing: All public education materials must be delivered within 60 days after the end of the monitoring period in which the exceedance occurred and repeated once every 12 months, EXCEPT providing information on or in each water bill, which must be included in each billing cycle (no less than quarterly or the Primacy Agency can approve a separate mailing) and two press releases per 12 month period for as long as you exceed the lead action level. Also, the Primacy Agency can allow activities to extend beyond the 60-day requirement if needed for implementation purposes; however, this extension must be approved in writing in advance of the 60-day deadline. Note: This extension is only appropriate if the system has initiated public education activities prior to the end of the 60-day deadline.

For more information go to *Implementing the Lead Public Education Provision of the Lead and Copper Rule: A Guide for Community Water Systems*; Section 1, page 9: Required Methods of Delivery for Community Water Systems.

Table 2. Required Methods of Delivery for Small and Large Community Water Systems

Small (<3,300 customers)	Large (>3,300 customers)
Deliver printed materials (pamphlets, brochures, posters) to all bill paying customers	Deliver printed materials (pamphlets, brochures, posters) to all bill paying customers
Deliver public education materials to the following facilities and organizations that are served by the system that are most likely to be visited regularly by pregnant women and children: 1. Local public health agencies[1] 2. Public and private schools or school boards 3. Women Infants and Children (WIC) and Head Start programs 4. Public and private hospitals and medical clinics 5. Pediatricians 6. Family planning clinics 7. Local welfare agencies	Deliver public education materials to the following organizations that are located within your service area, along with a cover letter encouraging distribution to all potentially affected customers or users: 1. Local public health agencies 2. Public and private schools or school boards 3. Women Infants and Children (WIC) and Head Start programs 4. Public and private hospitals and medical clinics 5. Pediatricians 6. Family planning clinics 7. Local welfare agencies

[1]If you do not have a local public health agency, you should contact your State Health Department.

Tip: To obtain a list of organizations in your area, contact your local Public Health Agency. Additional informational resources of associations and licensing agencies of these organizations may be found in *Implementing the Public Education Provision of the Lead and Copper Rule: A Guide for Community Water Systems*; Appendix C.

Systems are required to contact their local Public Health Agencies directly (either in person or by phone).

Table 2. Required Methods of Delivery for Small and Large Community Water Systems (continued)	
Small (<3,300 customers)	**Large (>3,300 customers)**
Make a good faith effort to locate the following organizations within the service area and deliver materials that meet the content requirements, along with an informational notice that encourages distribution to all potentially affected customers or users. The good faith effort to contact at-risk customers may include requesting a specific contact list of the organizations from the local Public Health Agencies, even if the agencies are not located within the water system service area:[2] 1. Licensed childcare centers 2. Public and private preschools 3. Obstetricians-Gynecologists and Midwives	Make a good faith effort to locate the following organizations within the service area and deliver materials that meet the content requirements, along with an informational notice that encourages distribution to all potentially affected customers or users. The good faith effort to contact at-risk customers may include requesting a specific contact list of the organizations from the local Public Health Agencies, even if the agencies are not located within the water system service area:[2] 1. Licensed childcare centers 2. Public and private pre-schools 3. Obstetricians-Gynecologists and Midwives
Provide information on or in each water bill (no less than quarterly or Primacy Agency can approve a separate mailing)[3,4]	Provide information on or in each water bill (no less than quarterly or Primacy Agency can approve a separate mailing)[3,4]
Submit press release to newspaper, television, and radio stations[5]	Submit press release to newspaper, television, and radio stations
Conduct one (1) activity from one of the following general categories:[6,7] • Public Service Announcements • Paid Advertisements • Display Information in Public Areas • Email to Customers • Public Meetings • Delivery to Every Household • Provide Materials Directly to Multi-family Homes • Other Methods Approved by the Primacy Agency	Conduct three (3) activities from one, two, or three of the following general categories:[6,7,8] • Public Service Announcements • Paid Advertisements • Display Information in Public Areas • Email to Customers • Public Meetings • Delivery to Every Household • Provide Materials Directly to Multi-family Homes • Other Methods Approved by the Primacy Agency
	Post material on a publicly accessible Web site (for systems serving >100,000 individuals)

[2]For further clarification of a good faith effort, you should consult with your Primacy Agency.
[3]Primacy Agency may allow a separate mailing if you cannot place information on the water bill.
[4]You may add additional pages (e.g., public education brochure) to the Consumer Confidence Report if timing is appropriate. However, it may be rare that timing will coincide, given that the CCR must contain compliance data collected in the previous calendar year and the report must be provided to consumers no later than July 1 (i.e., the report issued by July 1, 2007 contains compliance data collected in calendar year 2006).
[5]Primacy Agency may waive this requirement as long as you distribute notices to every household served by your system.
[6]You should discuss/verify with your Primacy Agency to ensure fulfillment of all requirements.
[7]Appendix B of *Implementing the Lead Public Education Provision of the Lead and Copper Rule: A Guide for Community Water Systems* contains customizable templates for PE materials that may be used to meet these requirements.
[8]For example, you may do 3 PSAs or 3 public meetings if the Primacy Agency allows.

United States Environmental Protection Agency

Table 3. Other Public Information Requirements – Regardless of An Action Level Exceedance
Consumer Confidence Report (CCR) Requirements[1]
Every report must include the following lead-specific information: *If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. [NAME OF UTILITY] is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at* **http://www.epa.gov/safewater/lead**.
A system may write its own statement in consultation with the Primacy Agency.
Notification of Results – Reporting Requirements[2]
Must provide a consumer notice of lead tap water monitoring results to all persons served at the tap from which the sample was taken.
Must provide consumer notice as soon as practical, but no later than 30 days after system learns of tap monitoring results.
Must include the following information: results of lead tap water monitoring, an explanation of the health effects of lead (you may use the health effects language found in Table 1), list steps consumers can take to reduce exposure to lead in drinking water, and utility contact information. This notice must also include the maximum contaminant level goal (MCLG) for lead and the action level (AL) for lead and the following definitions for these two terms: *The MCLG for lead is zero and the action level is 15ppb. The MCLG is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. The action level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.*
Must be provided to all persons served at the site by mail or other methods (subject to approval by the Primacy Agency). This includes those who do not receive a water bill.

[1]CWSs in States where EPA is the Primacy Agency or have adopted the Revisions by December 2008 must begin including the lead informational statement in CCRs that are due to consumers by July 1, 2009 (i.e. the 2008 CCR). Otherwise, CWSs must begin to include this information in the 2009 CCR.

[2]Consumer Notification of Results templates are available in *Appendix B* of *Implementing the Lead Public Education Provision of the Lead and Copper Rule: A Guide for Community Water Systems*.

For Additional Information:

- *Implementing the Lead Public Education Provision of the Lead and Copper Rule: A Guide for Community Water Systems (EPA 816-R-08-007, June 2008).*
- EPA's Website on Lead in Drinking Water – Lead and Copper Rule: **www.epa.gov/safewater/lcrmr**
- EPA's Safe Drinking Water Hotline: (800) 426-4791
- Your Primacy Agency

ATTACHMENT

8

United States
Environmental Protection
Agency

Office of Water
(4606)

EPA 816-D-05-001
October 2005

DRAFT 10-06-05

Getting the Lead Out - A Guide to Reducing Lead in Drinking Water in Schools

Revised Guidance for Schools

Working draft for public review

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Contents

Exhibits

1. Introduction

The Environmental Protection Agency (EPA) is responsible for implementing the Safe Drinking Water Act (SDWA), which is the federal law intended to safeguard the nation's drinking water. EPA is concerned about the potential for elevated lead levels in tap water provided for drinking in schools and child care facilities. Children are vulnerable to health risks associated with elevated lead levels in drinking water. The adverse health effects from lead include impaired mental development, IQ deficits, shorter attention spans, and lower birth weight. Exposure to lead is particularly a significant health concern in young children and infants because their bodies tend to absorb more lead than the average adult.

In general, lead gets into drinking water by leaching from plumbing materials and fixtures as water moves through your school's distribution system. Because lead concentrations can change as water moves through the distribution system, the best way to know if a school or child care facility might have high levels of lead in its drinking water is by testing the water in that school or child care facility. Testing facilitates an evaluation of the plumbing and helps target remediation. It is a key first step in understanding the problem, if there is one, and designing an appropriate response.

There is no federal law requiring sampling of drinking water in schools, except for schools that have their own water supply. The vast majority of public water systems do not include schools in their sampling plans, because the EPA rule governing lead in drinking water focused on the sampling of single family dwellings. States and local jurisdictions may, however, establish programs for testing drinking water lead levels in schools.

In December of 2004, the EPA held a national meeting to discuss the potential of lead exposure in school and child care facilities. At the meeting, Assistant Administrator, Benjamin H. Grumbles introduced the **"3T's"** of minimizing lead exposure in school drinking water. The 3T's are:

- *Training* school officials to raise awareness of the potential occurrences, causes, and health effects of lead in drinking water, and to promote better monitoring of drinking water for lead.

- *Testing* of drinking water in schools to identify potential problems.

- *Telling* students, parents, staff, and the larger community about monitoring programs, potential risks, the results of testing, and remediation actions.

The 3T's, along with remediation, will help guide your school to provide safe drinking water to its students and staff.

1.1 Who Should Use This Manual

This manual is intended for use by officials responsible for the maintenance and/or safety of school facilities, including the drinking water. The manual is specifically targeted at schools that receive water from water utilities or water companies such as cities, towns, and water districts.

1.2 Purpose of the Manual

The purpose of this manual is to help schools minimize their students' and staff's exposure to lead in drinking water. It contains recommendations on how to address lead in school drinking water systems; these are suggestions only and are not requirements. This manual does, however, also contain an overview of requirements concerning lead in drinking water. The statutory provisions and regulations described in this document contain binding requirements. The general description here does not substitute for those laws or regulations; nor is this document a regulation itself. As a result, you will need to be familiar with the details of the rules that are relevant to school drinking water systems; you cannot rely solely on this guidance for compliance information. Also, many States (or Tribes) and localities have different, more stringent requirements than EPA's, so you will need to find out what other laws and regulations apply to school drinking water in addition to the ones described here.

1.3 Approach

EPA recommends that key staff, as well as school board members and administrators take the following specific steps to reduce lead in the drinking water in schools:

(1) Conduct a thorough review of this guidance document. Other reference documents are available. See Appendix B.

(2) Review available resources to find out what may already have been done and what assistance may be available to you. See Chapter 2.

(3) Develop a plumbing profile to assess the factors that contribute to lead contamination. See Chapter 3.

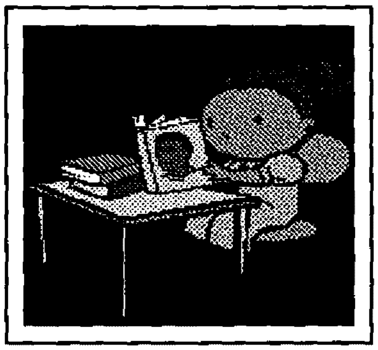
(4) Develop a drinking water sampling plan. See Chapter 3.

(5) Test the water. See Chapter 4.

(6) Correct any problems that are identified. See Chapter 5.

(7) Communicate to students, parents, staff, and the larger community about what you are doing to protect them from possible exposure to lead in drinking water. See Chapter 6.

1.4 Health Effects of Lead



Lead is a toxic metal that can be harmful to human health when ingested or inhaled. Even small doses of lead can be harmful. Unlike most other contaminants, lead is stored in our bones, and can be released later into the bloodstream. Thus, even small doses can accumulate and become significant. The groups most vulnerable to lead include fetuses and young children.

Exposure to lead is a significant health concern for young children and infants whose growing bodies tend to absorb more lead than the average adult. Childhood lead exposure can impair the development of the brain and central nervous system. Children under the age of six are at the highest risk because of their rate of growth. Even at low levels of lead exposure, children may experience lower IQ levels, impaired hearing, reduced attention span, and poor classroom performance. At higher levels, lead can cause even more serious brain damage. **Testing drinking water in schools and child care facilities is important because children spend a significant portion of their day in these facilities and are likely to consume water while they are there.**

Other groups that are vulnerable to lead are people who are immuno-compromised, as well as pregnant women and fetuses. Accumulated lead stored in mothers' blood may damage a child before it is born, causing a lower birth weight and slowing down normal physical and mental development.

The degree of harm from lead exposure depends on a number of factors including the frequency, duration, and dose of the exposures(s) and individual susceptibility factors (e.g., age, previous exposure history, nutrition, and health). In addition, the degree of harm depends on one's total exposure to lead from all sources in the environment–air, soil, dust, food, and water. Lead in drinking water can be a significant contributor to overall exposure to lead, particularly for infants whose diet consists of liquids made with water, such as baby food or formula.

1.5 Sources of Lead

Lead is distributed in the environment through both natural and human-made means. Today, the greatest contributions of lead to the environment stem from past human activities. Sources that produce excess lead exposure include the following:

- **Lead based paint** (which can flake off onto soil, window sills, or floors and be ingested by children).

- **Lead in the air** (from industrial emissions).

- **Dust and soil** (lead deposits in soils around roadways and streets from past emissions by automobiles using leaded gas, together with paint chips and lead paint dust, find their way into the mouths of young children living in these environments).

- **Lead dust** (brought home by industrial workers on their clothes and shoes).

- **Lead in water** (through corrosion of plumbing products containing lead).

The U.S. government has taken steps over the past several decades to dramatically reduce new sources of lead in the environment - by banning the manufacture and sale of leaded paint, by phasing out lead additives in gasoline, by encouraging the phase-out of lead seams in food cans, by banning the sale of pipes and plumbing for drinking water that are not "lead-free", and by banning lead-lined water coolers, among other activities. More recently, the government has begun to address persistent sources of lead in the environment. For example, programs have been instituted to minimize the hazards posed by old lead paint covering millions of homes across the United States, more stringent air control standards are being applied to industries emitting lead, and more stringent regulations are in place to control lead in drinking water. Regulations affecting lead in drinking water are described at the end of this chapter.

1.6 How Lead Gets into Drinking Water

Lead can get into drinking water in two ways:

(1) by being present in the source water, such as coming from contaminated runoff or water pollution.

(2) through an interaction between the water and plumbing materials containing lead, such as through corrosion.

(1) <u>At the Source</u>

Most sources of drinking water have no lead or very low levels of lead (i.e., under 5 parts per billion). However, lead is a naturally occurring mineral and in some instances can get into well water. Lead can enter surface waters (waters from rivers, lakes, or streams) through direct or indirect discharges from industrial or municipal wastewater treatment plants or when lead in air settles into water or onto city streets and eventually, via rain water, flows into storm sewers, or waterways, which may enter the water supply. Lead from these sources can be easily removed by existing treatment plant technologies.

(2) <u>Through Corrosion</u>

Most lead gets into drinking water after the water leaves the local well or treatment plant and comes into contact with plumbing materials containing lead. These include lead pipe, lead solder (commonly used until 1986), as well as faucets, valves, and other components made of brass. The physical/chemical interaction that occurs between the water and plumbing is referred to as corrosion. The extent to which corrosion occurs contributes to the amount of lead that can be released into the drinking water.

The ***critical issue*** is that even though your public water supplier may deliver water that meets all Federal and State public health standards for lead, you may end up with too much lead in your drinking water because of the plumbing in your facility. The potential for lead to leach into water can increase the longer the water remains in contact with lead in plumbing. This increase occurs up to a certain time limit, which can vary from facility to facility. ***As a result, facilities with intermittent water use patterns, such as schools, may have elevated lead concentrations***. That is why testing water from your drinking water outlets for lead is so important. Drinking water outlets are locations where water may be accessed for consumption such as a drinking fountain, water faucet, or tap.

The corrosion of lead tends to occur more frequently in "soft" water (i.e., water that lathers soap easily) and acidic (low pH) water. Other factors, however, also contribute to the corrosion potential of the water and include water velocity and temperature, alkalinity, chlorine levels, the age and condition of plumbing, and the amount of time water is in contact with plumbing. The occurrence and rate of corrosion depend on the complex interaction between a number of these and other chemical, physical, and biological factors.

As illustrated in Exhibit 1.1, once the water leaves the public water supply system or treatment plant, drinking water comes into contact with 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. These components may or may not be owned by your water systems.

The public water supplier is responsible for producing water that is not corrosive if unacceptable levels of lead are found (see "How Lead in Drinking Water is Regulated" in section 1.7). However, centralized treatment by a utility does not guarantee that corrosion of lead from plumbing will not occur within buildings served by the utility, i.e., your school.

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. Pictures of some of the common drinking water outlets are reflected in Exhibit 1.2. (The glossary in Appendix A provides definitions of the various drinking water outlets discussed in this document.) Although there is an increased probability that a given plumbing component installed prior to the 1990s could contain more lead than the newer components, the *occurrence of lead in drinking water can not be predicted based upon the age of the component or the school facility.*

Exhibit 1.1: Potential Sources of Lead in Schools

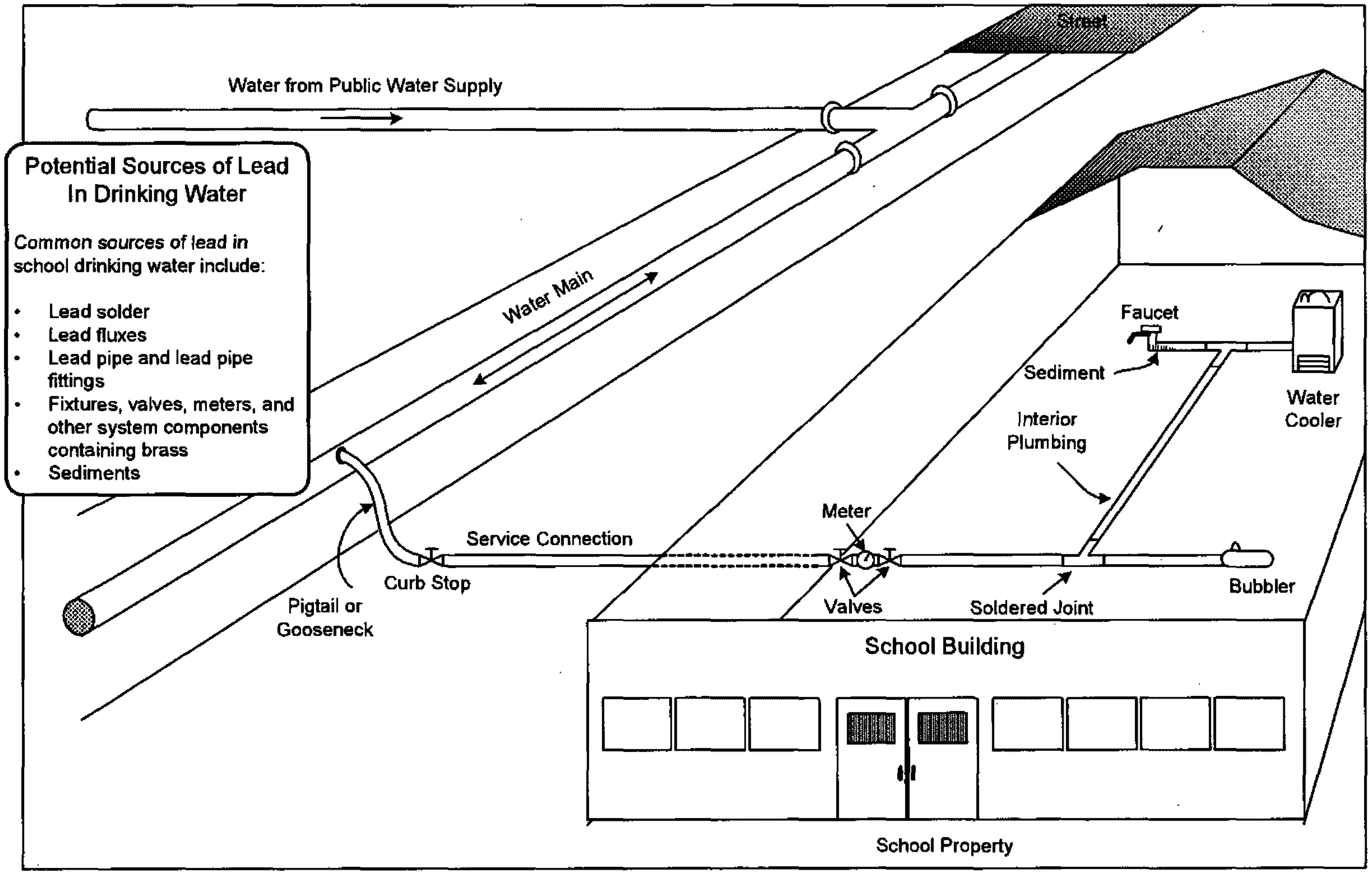
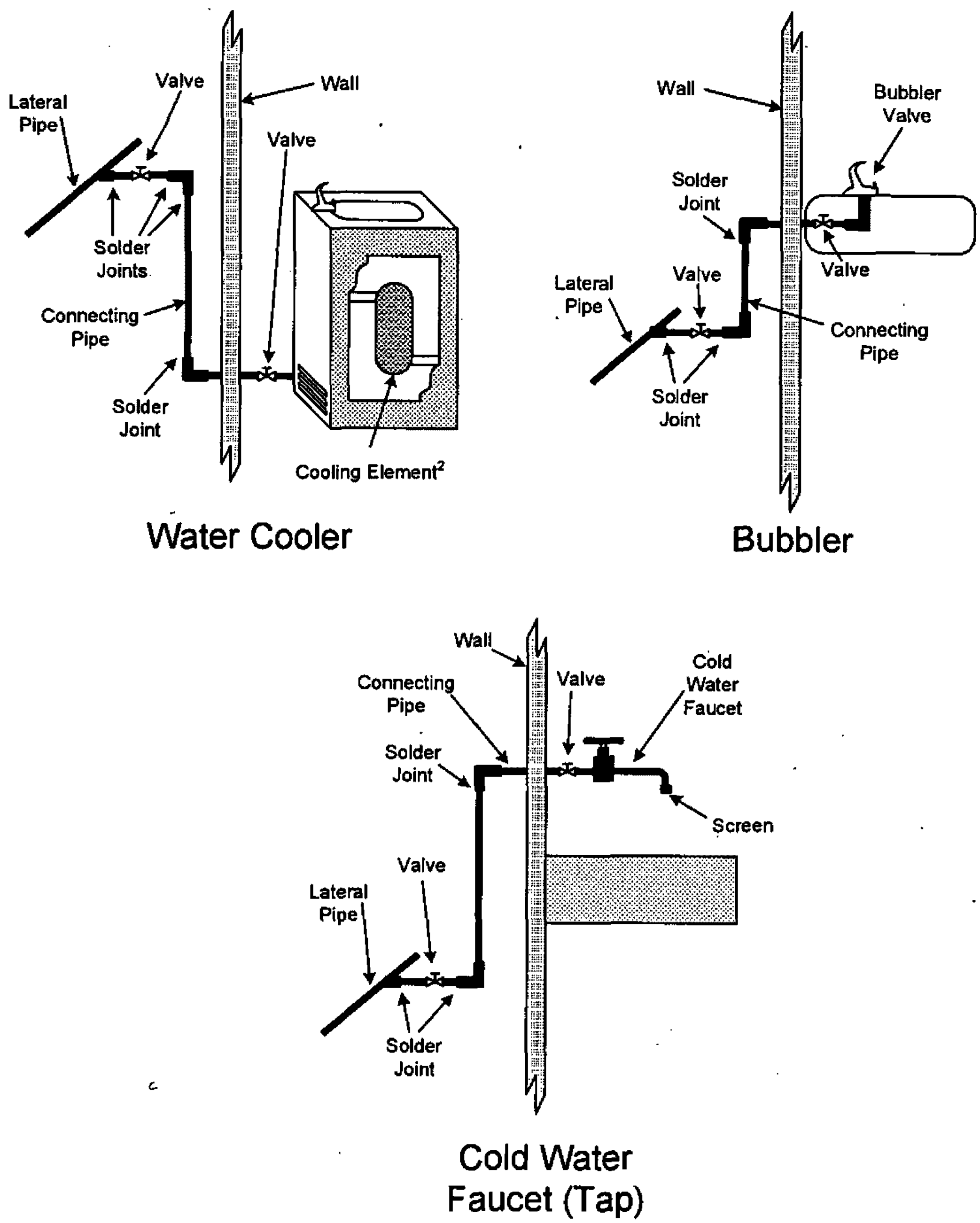
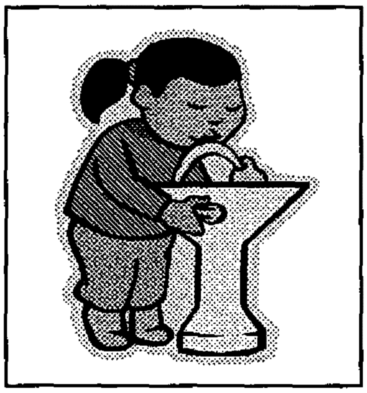


Exhibit 1.2: Common Drinking Water Outlets



[1]Valve locations are approximate and will vary, depending upon installation.
[2]Old cooling elements may be lead-lined. For more information on replacement of lead-lined cooling elements, see Appendix D of this document.

1.7 How Lead in Drinking Water is Regulated



Lead is regulated in non-bottled drinking water under a Federal law known as the Safe Drinking Water Act (SDWA). This Act was initially passed in 1974 and, in part, requires EPA to establish regulations for known or potential contaminants in drinking water for the purpose of protecting public health.

The requirements developed by EPA apply to **public water systems**. *Schools that are served by a water utility* are generally not subject to the SDWA monitoring and treatment requirements, because they are subject to an exclusion in the law. However, some states may have monitoring and treatment requirements for these schools. Questions in this regard may be directed to the appropriate state drinking water program office or the State Department of Education or Public Instruction (see Appendix C for a directory of State programs).

Additional requirements under the Safe Drinking Water Act include specific provisions for controlling lead in drinking water:

- THE LEAD BAN (1986): A requirement that only lead-free materials be used in new plumbing and in plumbing repairs.
- THE LEAD CONTAMINATION CONTROL ACT (LCCA) (1988): The LCCA further amended the SDWA. The LCCA is aimed at the identification and reduction of lead in drinking water at schools and child care facilities. *However,* implementation and enforcement of the LCCA has been at each state's discretion. School monitoring and compliance has varied widely.
- THE LEAD AND COPPER RULE (1991): A regulation by EPA to minimize the corrosivity and amount of lead and copper in water supplied by public water systems.

The table below summarizes the significant elements of the SDWA with respect to lead in drinking water. *Note that the 1991 Lead and Copper Rule does not apply to schools that receive water from a water utility.*

REQUIREMENTS UNDER THE SAFE DRINKING WATER ACT

- The 1986 SDWA Lead Ban. This provision of the SDWA requires the use of "lead-free" pipe, solder, and flux in the installation or repair of any public water system *or* any plumbing in a residential or non-residential facility connected to a public water system. Solders and flux are considered to be lead-free when they contain less than 0.2 percent lead. Before this ban took effect on June 19, 1986, solders used to join water pipes typically contained about 50 percent lead. Pipes and pipe fittings are considered lead-free under the Lead Ban when they contain less than 8 percent lead. Plumbing fixtures that are not :lead free: are banned from sale after August 6, 1998.

- The 1988 Lead Contamination Control Act (LCCA). The purpose of the LCCA is to reduce lead exposure and the health risks associated with it by reducing lead levels in drinking water at schools and child care centers. The LCCA created lead monitoring and reporting requirements for all schools, and required the replacement of drinking water fixtures that contained excessive levels of lead (see Appendix D for a listing of these fixtures). These provision are not enforceable, as a result States have the option to voluntarily enforce the provisions of the Act (or alternate provisions) through their own authority.

- The 1991 Lead and Copper Rule (LCR). The LCR requires public water systems to monitor for lead in drinking water and to provide treatment for corrosive water if lead or copper are found at unacceptable levels. EPA strongly recommends that schools test their facilities for lead. However, unless a school owns its public water system, testing for lead and copper within the school is not specifically required. Therefore, many schools served by water systems owned by cities, towns, or other entities may have never been tested for lead under the LCR.

"EPA strongly recommends that all water outlets in all schools that provide water for drinking or cooking meet a lead standard of 20 parts per billion (ppb) lead or less."

PUBLIC WATER SUPPLY TESTING VS. TESTING AT SCHOOLS

It is important to note that the lead testing protocol used by public water systems is aimed at identifying system-wide problems rather than problems at outlets in individual buildings. Moreover, the protocols for sample size and sampling procedures are different. Under the LCR for public water systems, a lead action level of 15 parts per billion (ppb) is established for 1 liter samples taken by public water systems at high-risk residences. ~~The 15 ppb level is not a mandatory limit. However,~~ iIf more than 10 percent of the samples at residences exceeds 15 ppb, system-wide corrosion control treatment may be necessary. The 15 ppb action level for public water systems is therefore a trigger for treatment rather than simply a health-based level.
~~EPA strongly recommends that all water outlets in all schools that provide water for drinking or cooking meet a lead standard of 20 ppb or less. The 20 ppb level established for schools is a health-based level for children. Without conducting sampling of each outlet that provides water for drinking or cooking at each school facility, conformance with the 20 ppb level cannot be confirmed.~~
EPA recommends that schools collect 250 ml first-draw samples from water fountains and outlets and that the water fountains and/or outlets be taken out of service if the lead level exceeded 20 ppb. The sample was designed to pinpoint specific fountains and outlets that required remediation (e.g. water cooler replacement). The school sampling protocol maximizes the likelihood that the highest concentrations of lead are found because the first 250mL are analyzed for lead after overnight stagnation.

2. Planning Your Program and Establishing Partnerships

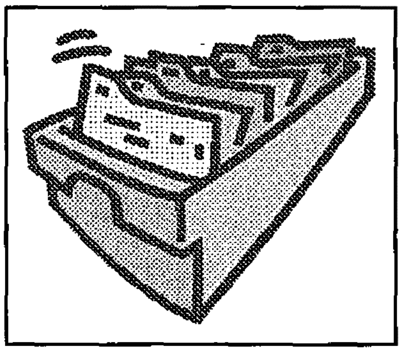
Monitoring for lead in your school's drinking water is extremely important. If you have never or have not recently monitored for lead in your school's drinking water, you are encouraged to begin the process by identifying any lead problems that you may have in your drinking water. You should start by identifying your existing resources, which include school records, available finances, and personnel. You should also research opportunities for assistance from your local water utility, State and local health agencies, and certified water testing laboratories.

2.1 Assigning Roles

Your school should assign responsibility to a key individual(s) to ensure that testing and follow-up actions are completed. A person should also be appointed to serve as the contact person for communication with interested parties (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.

If your school decides to use consultants or lab personnel, their roles should be defined with respect to the responsible person(s) at the school. Contact your state drinking water program or local health department if you need advice on how to identify a qualified consultant.

2.2 School Records



To determine if previous monitoring efforts have been made at your school, you should review your school records. Some schools conducted voluntary monitoring in cooperation with State or local officials in response to the 1988 Lead Contamination Control Act (LCCA). Other schools may have sampled for lead in response to State requirements. This information will be useful in filling out your Plumbing Profile Questionnaire (see Chapter 3), a tool that may be used to help determine whether lead is likely to be a problem in your facility. Records should also be reviewed to determine whether remediation actions have been taken. For example, have water coolers that contain lead been replaced (see Appendix D for a listing of banned water coolers)? While these records may not make additional testing or remediation unnecessary, they will help to prioritize your efforts and make them more efficient.

If testing or remediation was conducted in response to the 1988 Lead Contamination Control Act, it may have taken place 10 years ago or more. If you are not familiar with what activities may have taken place at your school and your records are incomplete or absent, you are encouraged to contact individuals that may have been involved in the past. Personnel that were involved may remember activities that were not well-documented. They may also remember whether other agencies or the local water utility were involved, which may mean that additional records are available.

2.3 Establishing Partnerships

2.3.1 Assistance from Your Water Utility

Some water utilities have devoted resources to helping schools conduct testing for lead even though they may not be legally required to do so. As discussed in the previous chapter, public water systems are required by the Lead and Copper Rule to monitor for lead at customers' taps. However, testing at schools was not specifically required unless the public water system was owned and operated by the school. Therefore, unless a school served by a water utility tested for lead on its own, or had testing voluntarily conducted by the utility, neither the school nor the utility is likely to have any record of testing. Although the utility may treat the water to minimize corrosion, it is very important that you test to determine to what extent lead is leaching from plumbing within the school.

You are encouraged to contact your utility to determine whether information on previous efforts or assistance is available. Although utilities are under no obligation to do so, assistance may be available through technical guidance, sampling, or sharing of sampling costs. Some utilities may be willing to help develop plumbing profiles and sampling plans (see Chapter 3). The American Water Works Association (AWWA), a non-profit organization of water system professionals, recently prepared a summary of information for utilities to assist them in their efforts to help schools.

You should obtain from your utility the results of its required monitoring under the Lead and Copper Rule to determine whether your utility is in compliance with the requirements of the Lead and Copper Rule. Your utility should be able to tell you whether lead monitoring is current, whether the monitoring results are below the lead action level, and whether corrosion control treatment is provided. Your utility should also be able to tell you whether they have conducted lead monitoring at your school, and they may be able to give you some indication of whether lead could be a problem within your building(s).

You may wish to begin by contacting your local director of public works, water superintendent, or water department, depending upon how your utility is organized. Some utilities have Web sites with contact information.

Questions to Ask Your Drinking Water Supplier

It is important to know who supplies your facility's drinking water, and whether and how the water entering your facility is treated. Some kinds of treatment can make the water more corrosive, while others will reduce the problem. If the water is corrosive, treatment can reduce lead levels throughout the system and can save you and the supplier money by reducing damage to plumbing. The following are some questions you may want to ask your public utility about your water:

- Is the water system in compliance with Federal and State standards for lead monitoring and treatment?
- Does the utility have sample results from the school or from nearby locations?
- Is the water corrosive? If so, what is the system doing to minimize corrosion?
- If a corrosion control chemical is used, does the chemical form a protective coating inside the piping?
- Does the water distribution system have any lead piping (for example, lead goosenecks at service connections) and does the system plan to remove these sources of lead?
- Would the utility provide assistance in your effort?

2.3.2 Assistance from Your State Drinking Water Program

As discussed in Chapter 1, the only federal requirement that applies uniformly to schools that receive water from a water utility is the ban on the installation of water system components that are not lead-free (the Lead Ban).

You are encouraged to contact your state program to determine whether any other requirements apply, or whether technical assistance is available. A listing of state program contacts is contained in Appendix C. Most state programs also have Web sites with contact information. When discussing the issue with your state program, you may wish to request assistance with voluntary compliance with the Lead Contamination Control Act. Since most state programs are familiar with the Act, this should help to clarify your request.

If you have not been able to make contact with your local water utility, you may also wish to ask whether the state program can provide information on monitoring compliance, results, and treatment. Your state program regulates all such utilities for compliance with the Lead and Copper Rule, and therefore should have this information readily available.

You may also wish to ask the state drinking water program staff as to whether they have knowledge of other state programs that are involved in reducing lead risks for children. There may be an interest in a developing a cooperative effort between state programs or between state and local agencies.

2.3.3 Assistance from Your Local Health Office

Many local governments have established programs that are responsible for a wide variety of public health protection activities, such as a Lead Poisoning Prevention Program. These programs are often the first line of defense when public health risks arise. Lead programs for children are often a high priority for local health offices.

You may wish to contact the local health office to discuss your needs. Although resources may be limited, the office may be willing to provide assistance in a variety of ways. For example, a representative may be able to attend Parent and Teacher Association meetings to discuss potential health effects, as well as to act as a contact with state programs to obtain information and assistance. A representative may even be able to assist in developing the plumbing profile, conducting sampling, or in taking follow-up action.

You should be able to find a phone number for your local health office in the listings under your county or city government. Many offices also have a Web site. The following Web site contains information about many local health departments listed by state http://www.healthguideusa.org/local_health_departments.htm.

2.3.4 Assistance from Certified Laboratories

Your state drinking water office should be able to provide a list of certified laboratories in your area. You should only use a laboratory that is certified by the State or EPA for testing lead in drinking water for public water systems.

Some laboratories will provide assistance in addressing the activities described in this manual. For example, some laboratories will collect samples for clients to ensure proper sampling technique and sample preservation. However, costs for services will vary and you may wish to contact several certified labs.

If outside laboratory personnel are used, you should ensure that they understand the testing procedures described in this manual because these procedures differ from those used by public water systems for compliance with the Lead and Copper Rule.

2.3.5 Assistance from Local Community Organizations

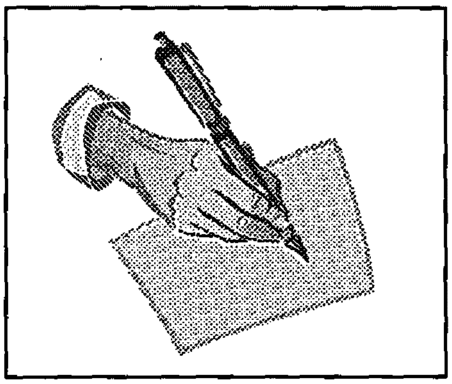
In your community there may be a variety of local organizations that can help; for example, community volunteer groups, senior citizens groups, the Parent and Teacher Associations, and local environmental groups. Another useful resource is your region's Pediatric Environmental Health Speciality Unit (PEHSU). Your region's PESHU may be able to provide risk communication and support to school districts; for more information please visit http://www.aoec.org/PEHSU.org.

Contacting these groups is another way for your school to foster support. These groups might be willing to volunteer time to collect samples and train others to collect samples.

3. Assessment and Strategy: Plumbing Profile and Sampling Plan

Now that you understand the potential dangers of lead contamination in drinking water and the laws and programs in place to address this problem, it is time to begin development of a plumbing profile and a sampling plan.

3.1 Development of a Plumbing Profile for Your Water Distribution System



Before testing and correcting lead problems, it is important to target potential problems and 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 may be recommended for each. A plumbing profile can be created by answering a series of questions about your facility's plumbing. Conducting this survey of your facility's plumbing will enable you to:

- Understand whether you may have a widespread contamination problem or only localized concerns.
- Identify and prioritize sample sites. EPA recommends the following sites as priority sample sites: drinking fountains (both bubbler and water cooler style), kitchen sinks, classroom combination sinks and drinking fountains, home economics room sinks, teachers' lounge sinks, nurse's office sink, classroom sinks in special education classrooms, and any sink known to be or visibly used for consumption (e.g. coffee maker or cups are nearby).
- Plan, establish, and prioritize remedial actions, as necessary.

Exhibit 3.1 provides a plumbing profile questionnaire and provides a discussion and interpretations of possible answers designed to help you plan your testing strategy and develop your sampling plan. Planning your strategy will enable you to conduct testing in a cost-efficient manner. For a blank copy of the plumbing profile questionnaire, see Appendix H.

Exhibit 3.1: Sample Plumbing Profile Questionnaire and Answer

Plumbing Profile Questionnaire	What Your Answers to the Plumbing Profile Questionnaire Mean
The questions in this column will help you determine whether lead is likely to be a problem in your facility, and will enable you to prioritize your sampling effort.	This column discusses the significance of possible answers to the plumbing profile questions.
1. When was the original building constructed? Were any buildings or additions added to the original facility? If so, complete a separate plumbing profile for each building, addition, or wing.	**Older Buildings** – Through the early 1900s, lead pipes were commonly used for interior plumbing in certain parts of the country in public buildings and private homes. Plumbing installed before 1930 is more likely to contain lead than newer pipes. Between 1920 and 1950, galvanized pipes were also used for plumbing. After 1930, copper generally replaced lead as the most commonly used material for water pipes. Up until the mid- to late-1980s (until the lead-free requirements of the 1986 Safe Drinking Water Act took effect), lead solder was typically used to join these copper pipes. The efforts of your public water supplier over the years to minimize the corrosiveness of the water may have resulted in mineral deposits forming a coating on the inside of the water pipes (scaling). This coating insulates the water from the plumbing and results in decreased lead levels in water. If the coating does not exist or is disturbed, the water is in direct contact with any lead in the plumbing system. **Newer Buildings** – New buildings are not likely to have lead pipes in their plumbing systems, but they are very likely to have copper pipes with solder joints. Buildings constructed prior to the late 1980s, before the lead-free requirements of the 1986 Safe Drinking Water Act, may have joints made of lead solder. Buildings constructed after this period should have joints made of lead-free solders. Even if "lead free" materials were used in new construction and/or plumbing repairs, lead leaching may occur.

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? What type of solder has been used?	The 1986 amendments to the Safe Drinking Water Act banned plumbing components that contained high levels of lead. Lead-free solder and flux (not more than 0.2% lead) and pipe, and pipe fittings (not more than 8% lead) must now be used. The leaching potential of lead-free (i.e., tin-antimony) solder is much less than lead solder. The leaching potential of lead-free pipes, fittings, and fixtures is also less, but leaching is still possible. If lead-free materials were not used in new construction and/or plumbing repairs, very high lead levels can be produced. If the scaling does not exist or has not yet adequately formed, any lead that is present is in direct contact with the water.
3. When were the most recent plumbing repairs made (note locations)?	Corrosion occurs (1) as a reaction between the water and the pipes and (2) as a reaction between the copper and solder (metal-to-metal). This latter reaction is known as galvanic corrosion, which can be vigorous in new piping. If lead solders were used in the piping or if brass faucets, valves, and fittings containing alloys of lead were installed *(see response to Question 7 below for a further discussion of brass)*, lead levels in the water may be high. After about 5 years, however, this type of reaction (galvanic corrosion) slows down and lead gets into water mainly as a result of water being corrosive. If the water is non-corrosive, scaling is likely to have occurred and to have reduced opportunities for lead to get into the water system. For these reasons, if the building (or an addition, new plumbing, or repair) is less than 5 years old and lead solder or other materials (e.g., brass faucets containing lead alloys) were used, you may have elevated lead levels. If water supplied to the building is corrosive, lead can remain a problem regardless of the plumbing's age.
4. With what materials is the service connection (the pipe that carries water to the school from the utility's main in the street) made?	Lead piping was often used for the service connections that join buildings to public water systems. The service connection is the pipe that carries drinking water from a public water main to a building. Some localities actually required the use of lead service connections up until the lead-free requirements of the 1986 Safe Drinking Water Act took effect. Although a protective layering of minerals may have formed on these pipes, vibrations can cause flaking of any protective build-up and, thus, allow lead contamination to occur.

5. Specifically, what are the potable water pipes made of in your facility (note the locations)? • Lead • Plastic • Galvanized Metal • Cast Iron • Copper • Other	Survey your building for exposed pipes, preferably accompanied by an experienced plumber who should be able to readily identify the composition of pipes on site. Most buildings have a combination of different plumbing materials: Lead pipes are dull gray in color and may be easily scratched by an object such as a knife or key. Lead pipes are a major source of lead contamination in drinking water. Galvanized metal pipes are gray or silver-gray in color and are usually fitted together with threaded joints. In some instances, compounds containing lead have been used to seal the threads joining the pipes. Debris from this material, which has fallen inside the pipes, may be a source of contamination. Copper pipes are red-brown in color. Corroded portions may show green deposits. Copper pipe joints were typically joined together with lead solders until the lead-free requirements of the 1986 Safe Drinking Water Act took effect. Plastic pipes, especially those manufactured abroad, may contain lead. If plastic pipes are used, be sure they meet NSF International standards and are free of plasticizers that contain lead. *(Note: NSF International is an independent, third-party testing organization. Product listings can be obtained by visiting their Web site at http://www.nsf.org/business/search_listings/index/asp.)*
6. Was lead solder used in your plumbing system? Note the locations with lead solder.	The 1986 amendments to the Safe Drinking Water Act banned plumbing components that contained high levels of lead. Lead-free solder and flux (not more than 0.2% lead) must now be used. The leaching potential of lead-free (i.e., tin-antimony) solder is much less than lead solder.

7. 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.	Brass fittings, faucets, and valves are golden yellow in color, similar to copper in appearance, or are plated with chrome. Brass is composed primarily of two metals - copper and zinc - and is frequently machined with lead. After 1996, brass fittings installed in drinking water outlets such as faucets and water coolers must meet NSF standards for lead content. While this percentage is considered lead-free under the 1986 Safe Drinking Water Act, some contamination problems still may occur. Older brass faucets may contain higher percentages of lead and lead solder in their interior construction and pose contamination problems. Note that your state or local government may have imposed this standard prior to 1996. The degree to which lead will leach from brass products containing alloys with less than 8 percent lead is dependent upon the corrosiveness of the water and the manufacturing process used to develop the product. A study revealed that fabricated faucets tend to contribute less lead to the water than faucets manufactured by the permanent mold process, regardless of the amount of lead in the alloy. In response, to a requirement of the 1996 SDWA, EPA worked with the plumbing industry and NSF International to develop a voluntary industry standard that is designed to minimize the amounts of lead being leached from these products. This standard is NSF Standard 61, Section 9. Since 1998, all plumbing fixtures sold for use as drinking water supply must meet this standard. Before you purchase any brass plumbing products, you should request information regarding compliance with this standard.
8. How many of the following outlets provide water for consumption? Note the locations. • Water Coolers • Bubblers • Ice Makers • Kitchen Taps • Drinking Fountains or Taps	In addition to lead components in the plumbing system, lead solders or lead in the brass fittings and valves used in some taps, bubblers, and refrigerated water coolers may be sources of lead. It is important to identify the locations of all such drinking water outlets. Faucets in restrooms should not be used to obtain water for drinking. These sinks are not sanitary and you may consider posting signs to warn users.

9. Has your school checked the brands and models of water coolers and compared them to the listing of banned water coolers in Appendix D? Note the locations of any banned coolers.	Water coolers may be a major source of lead contamination. The Federal Consumer Product Safety Commission negotiated an agreement with Halsey Taylor through a consent order agreement published in June 1990 to provide a replacement or refund program that addresses all the water coolers listed by EPA as having lead-lined tanks. Halsey Taylor was the only company identified by EPA as manufacturing some water coolers with lead-lined tanks. Additionally, some coolers manufactured by EBCO had a bubbler valve and one soldered joint that contained lead. See Appendix D of this manual for a summary of EPA's list of water coolers found to contain lead. Use the list to help prioritize your sampling. If your water cooler is listed as having a lead-lined tank, you should not use the water for drinking and you should remove the cooler immediately as these coolers pose the highest risk of contamination.
10. 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.	Lead-containing sediments that are trapped on screens can be a significant source of lead contamination. Sediments should be tested for the presence of lead and the screens should be cleaned frequently. If sediment has been a problem, then regular cleaning of the screens is appropriate. However, the manufacturer should be contacted to obtain instructions for cleaning screens.
11. Have these screens been cleaned? Note the locations.	
12. Can you detect signs of corrosion, such as frequent leaks, rust-colored water, or stained dishes or laundry? Note the locations.	Frequent leaks, rust-colored water, and stains on fixtures, dishes, and laundry are signs of corrosive water. Blue-green deposits on pipes and sinks indicate copper corrosion; brown stains result from the corrosion of iron. Where such symptoms occur, high levels of lead, copper, and iron may be present in the water. Lead can accumulate with iron which can form sediments that are hard to remove.
13. Is any electrical equipment grounded to water pipes? Note the locations.	If electrical equipment, such as telephones, has been installed using water pipes as a ground, the electric current traveling through the ground wire will accelerate the corrosion of any interior plumbing containing lead. The practice should be avoided, if possible. However, if existing wires are already grounded to water pipes, the wires *should not be removed* from the pipes unless a qualified electrician installs an alternative grounding system. Check with your local building inspector on this matter. Your State or local building code may require grounding of the wires to the water pipes. Improper grounding of electrical equipment may cause severe shock.
14. Have there been any complaints about bad (metallic) taste? Note the locations.	Although you cannot see, taste, or smell lead dissolved in water, the presence of a bad or metallic taste may indicate corrosion and possible lead contamination.

15. 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?	As discussed previously, lead testing may have previously been done voluntarily under the Lead Contamination Control Act. Results of analyses of general water quality, such as measures of pH, calcium hardness, and carbonate alkalinity, can provide important clues about the corrosiveness of the water. Generally, the higher the values of these parameters, the less likely it is that your water is corrosive. If you have no data from your school, your utility should at least be able to provide information about the general water quality.
16. 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?	You should incorporate this information into decisions regarding sample locations and sampling protocol.

After reviewing the plumbing profile questionnaire and background regarding what your answers to the profile could mean (Exhibit 3.1), you have learned that lead contamination may not occur uniformly throughout a building. You should have an idea of the type of water you are receiving. From this assessment, you will then have a better sense of how to organize your testing activities. When planning your strategy, it is important to note that large variations in lead concentrations may be found among individual outlets in a facility because of differences in flow rates and/or building materials.

In general, you may find widespread presence of lead in your drinking water when:

- Lead pipes are used throughout the facility.

- The building's plumbing is less than 5 years old and lead solder was illegally used (i.e., after the "lead-free" requirements of the 1986 Safe Drinking Water Act amendments took effect). This situation is rare.

- The water is corrosive.

- Sediment or scale in the plumbing and faucet screens contain lead.

- Brass fittings, faucets, and valves were installed throughout the building less than 1 year ago (even though they may contain less than the "lead-free" requirements of the Safe Drinking Water Act).

- The service connection (i.e., the pipe that carries water from the public water system main to the building) is made of lead.

- Water coolers or other outlets have components that are not lead-free, especially if the water is corrosive.

In general, you can expect localized presence of lead if:

- Some brass fittings, faucets, and valves have been installed in the last year (even though they may meet the SDWA lead content requirements).

- Drinking water outlets are in line with brass flush valves, such as drinking water fountains near rest room supply piping.

- Lead pipes are used in some locations.

- The water is non-corrosive.

- Lead solder joints were installed in short sections of pipe before 1986 or were illegally installed after 1988 (i.e., after the lead-free requirements of the Safe Drinking Water Act took effect).

- There are areas in the building's plumbing with low flow or infrequent use.
- Sediment in the plumbing and screens frequently contains lead.
- Some water coolers or other outlets have components that are not lead-free.

After identifying potential problem areas in your facility through completion of a plumbing profile, the next step is to have the water tested. A sampling plan should be developed before testing begins. Key issues to consider in devising a sampling plan include the following:

- Who will be in charge of the sampling effort?
- Who will collect and analyze samples and maintain records?
- Where will the samples be taken?

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

As discussed in Chapter 2, it is important to designate a school employee(s) to take responsibility of the sampling program and follow-up activities, even if someone else is hired to conduct testing. If laboratory representatives or consultants are used to conduct testing, you should ensure that they have experience in conducting lead testing at schools. You may wish to ask the laboratory or consultant for references. Contact your State or local health department or drinking water program if you need advice on how to identify a qualified consultant.

3.3 Where Should I Sample? - Determining Sample Locations

You should decide where to take samples and how to prioritize the sample sites based on your responses to the plumbing profile and your knowledge of the facility. Generally, testing should be conducted at those outlets that are most likely to have contamination since they would represent the greatest hazards to human health. However, every outlet used for drinking or cooking should be sampled if possible. Priority sample sites that are most likely to have lead contamination include:

- Areas containing 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 EPA (See Appendix D) as having lead-lined storage tanks or lead parts should be removed.

It may be helpful to diagram the plumbing in your facility and the outlets that will require testing. Examples of plumbing configurations for a single-level building and a multi-level building are illustrated in Exhibits 3.2 and 3.3, respectively. Locate service connections, headers, laterals, loops, drinking water fountains (bubblers and coolers), riser pipes and different drinking water loops *(see Appendix A for a glossary of these plumbing terms)*, and decide in what order you wish to take samples.

As shown in the above-mentioned Exhibits, water is carried to the different floors in a multi-level building by one or more riser pipes. Water from the riser pipes is usually distributed through several different drinking water loops. In addition, in some buildings, water may be stored in a tank prior to distribution. In single-story buildings, the water comes from the service connection via main plumbing branches, often called headers. These, in turn, supply water to laterals. Smaller plumbing connections from the laterals and loops supply water to the faucets, drinking water fountains, and other outlets. For sampling purposes, water within a plumbing system moves "downstream" from the source (i.e., from the distribution main in the street through the service connection and through the building).

3.4 Who Should Collect the Samples and Where Do Samples Go for Analysis? - Collection and Analysis of Samples

Deciding who will collect samples will be based, in part, on who will analyze the samples. Some State drinking water programs or public water suppliers may provide both services, although there is no Federal requirement that they do so. Regardless of who collects the samples, you should employ a certified laboratory to conduct sample analyses. Contact your State drinking water program (Appendix C) or EPA's Safe Drinking Water Hotline (Appendix B) for a list of certified laboratories in your area. Consider the following issues prior to making a selection:

- Will the laboratory take samples for you or will they provide training and sample containers for collectors designated by you? (Testing activities can be useless if sample collectors do not follow proper sampling procedures.)

- If it is determined that a laboratory or other consultant will take your samples, make sure they understand the sample protocol. This protocol is described in the next section. *Make sure that laboratories or consultants thoroughly understand this protocol and do not confuse it with the lead testing protocol used by public water suppliers.* The two protocols are different.

- What is the cost of the laboratory's services? Costs will vary, depending upon the extent of the services to be provided (e.g., if only analyses are conducted or if other services such as sample collection are provided). You may want to contact several laboratories to compare prices and services, and you may wish to combine your sampling with another school to obtain a cheaper analysis rate.

- What is the laboratory's time frame for providing sample results?

- Recordkeeping is a crucial activity. *Appendix E contains a sample recordkeeping form and identifies the type of information you should consider recording.*

- You should have a written agreement or contract with the laboratory for all of the services to be provided.

Exhibit 3.2: Plumbing Configuration for a Single-Level Building

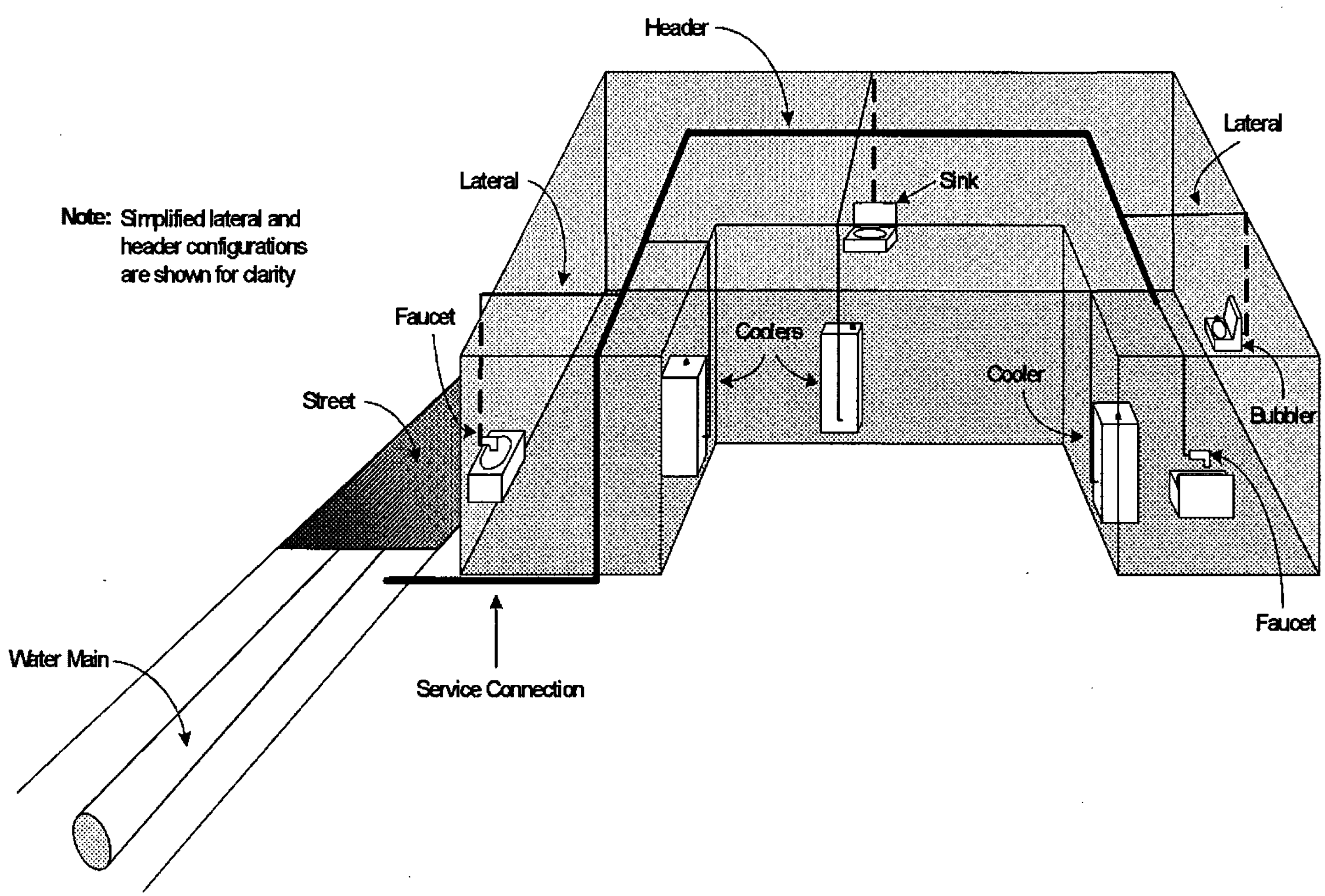
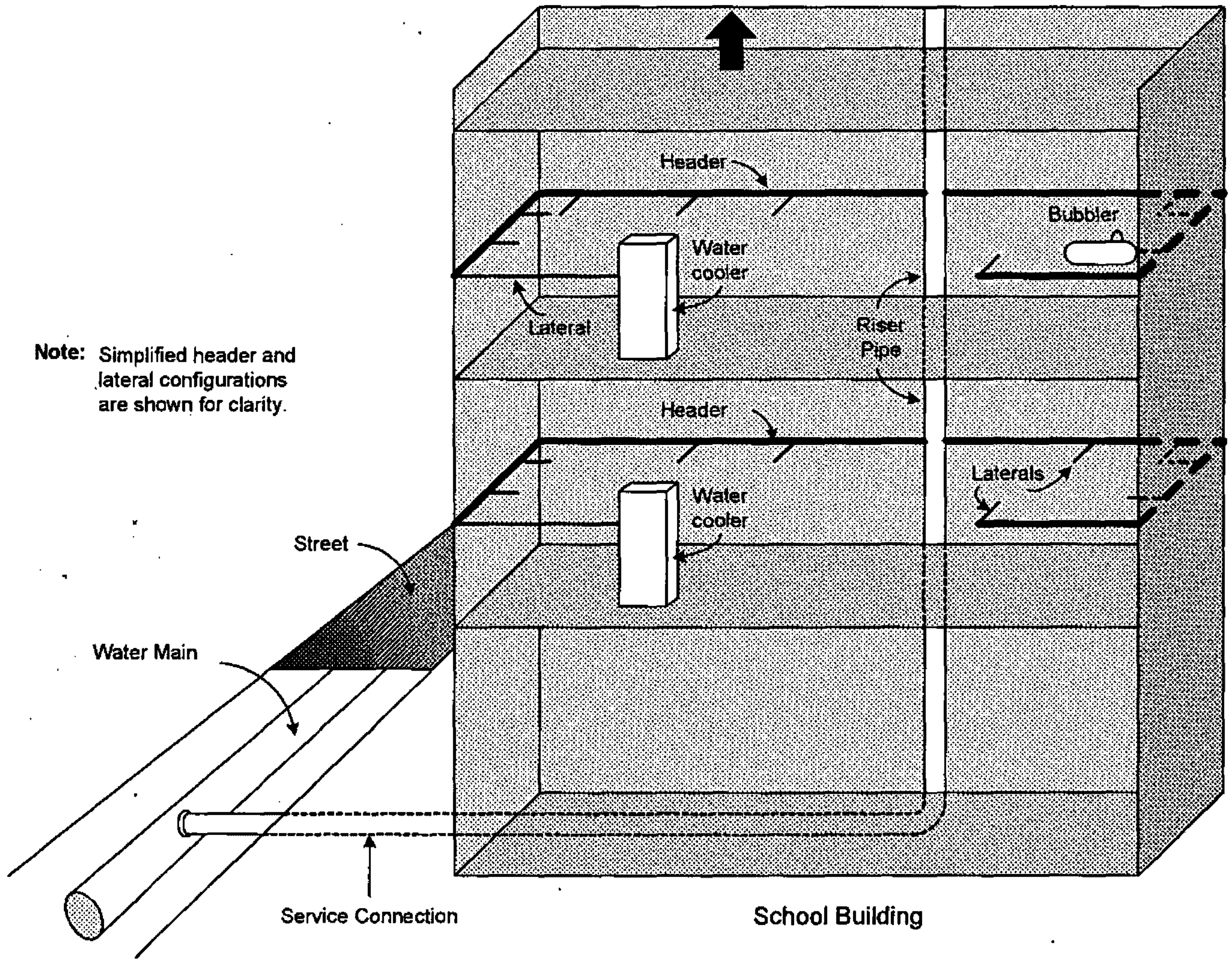


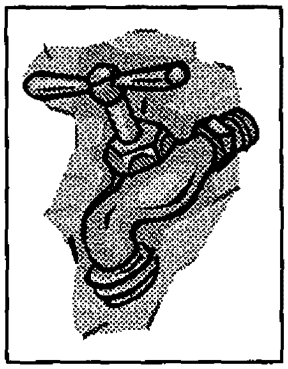
Exhibit 3.3: Plumbing Configuration for a Multi-Level Building

Note: Simplified header and lateral configurations are shown for clarity.



4. Conducting Sampling

4.1 Recommended General Sampling Procedures



This section outlines the general procedures EPA recommends for collecting drinking water samples for lead testing, and the two-step sampling process for sampling at your school. Please note that the general two step sampling process in this chapter contains recommendations for sampling that were created for typical plumbing configurations. If you believe that the recommendations do not fit your specific site conditions, you should modify them as appropriate. See additional discussion in 4.4.3.

4.2 Collection Procedures

- All water samples collected should be 250 milliliters (mL) in volume. School samples are smaller than the one-4liter sample collected by public water suppliers for compliance with the Lead and Copper Rule. A smaller sample is more effective at identifying the sources of lead in a building.

- Collect all water samples before the facility opens and before any water is used. Ideally, the water should sit in the pipes unused for at least 8 hours but not more than 18 hours before a sample is taken. However, water may be more than 18 hours old at some outlets that are infrequently used. If this is typical of normal use patterns, then these outlets should still be sampled.

- Make sure that no water is withdrawn from the taps or fountains from which the samples are to be collected prior to their sampling.

- Unless specifically directed to do so, do not collect samples in the morning after vacations, weekends, or holidays because the water will have remained stagnant for too long and would not represent the water used for drinking during most of the days of the week.

- Assign a unique sample identification number to each sample collected - use your sampling plan schematic with a numbering system. Record the identification number on the sample bottle and on your recordkeeping form *(see Appendix E)*. On your recordkeeping form include information on:
  - type of sample taken, e.g., initial, first follow-up, etc.
  - date and time of collection
  - name of the sample collector

- location of the sample site
- name of the manufacturer that produced the outlet, and the outlet's model number, if known.

Consult the sample form in Appendix E for additional recordkeeping items.

4.3 Laboratory Analysis and Handling of Sample Containers

As discussed in the previous chapter, the certified drinking water lab that you select will either collect the samples for you or they will provide you with materials and instructions if you plan to collect your own samples.

If you collect your own samples, you should follow the instructions provided by the laboratory for handling sample containers to ensure accurate results (*also see Appendix F – Preservation of Samples and Sample Containers*). Make sure the containers are kept sealed between the time of their preparation by the lab and the collection of the sample. Be sure to carefully follow the laboratory's instructions for preservation of the samples. Icing or refrigeration of the samples will likely be necessary. Most laboratories will provide shipping containers and ice packs if shipping is necessary.

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

Milligrams per liter (mg/L) is essentially the same as parts per million (ppm). Micrograms per liter (µg/L) is essentially the same as parts per billion (ppb).

Examples: 1 mg/L = 1000 µg/L = 1 ppm =1000 ppb; 0.020 mg/L = 20 µg/L = 20 ppb

4.

4 Overview of the Two-Step Sampling Process

EPA recommends that a two-step sampling process be followed for identifying lead contamination. In Step 1, initial samples are collected to identify the location of outlets providing water with high lead levels. In Step 2, follow-up water samples are taken only from problem locations to determine the lead level of water that has been stagnant in upstream plumbing, but not in the outlet fixture. The results of initial and follow-up samples are then compared to determine the sources of lead contamination and to determine appropriate corrective measures.

The protocol, which consists of an established sample size volume and water retention time, is designed to identify lead problems at outlets and upstream plumbing within school facilities.[1]

This section provides a brief definition and overview of the purpose of each of the two steps in EPA's lead testing process.

4.4.1 Step 1: Initial Sampling

In Step 1, initial screening samples are taken from the service connection and the drinking water outlets in the facility. These initial samples determine: a) the lead content of water from your facility's service connection and b) the lead content of water sitting in water outlets that are used for drinking or cooking within your building(s). The goal of Step 1 is to compare the lead level of water from your facility's service connection to water that has remained stagnant in the outlet or fixture.

To determine the lead content in water from your facility's service connection, first contact your public water supplier to identify what lead levels you might expect. *(If you completed the plumbing profile questionnaire in Appendix H that is also discussed previously in Exhibit 3.1, you will already have this information.)* Second, test water that is representative of your service connection and the mains in your public water system. Compare the results to determine what contribution your service connection is making to lead concentrations in your building (see Exhibit 4.2). Then, compare this finding to the results from outlets in the facility. For sampling instructions for initial samples from service connections, mains, and different types of water outlets, see Exhibits 4.3 through 4.9.

4.4.2 Step 2: Follow-Up Sampling

If initial test results reveal lead concentrations greater than 20 ppb for a given outlet, follow-up testing described in Step 2 is recommended to determine if the lead contamination results are from the fixture or from interior plumbing. EPA has established this trigger for follow-up testing to ensure that the sources of lead contamination in drinking water outlets are identified.

In Step 2, follow-up samples are collected and analyzed from outlets that revealed lead concentrations greater than 20 ppb in the initial test results. The purpose of Step 2 is to pinpoint where (e.g., fixtures or interior plumbing) lead is getting into drinking water so that appropriate

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[1]Under the National Primary Drinking Water Regulations for public water supplies, a lead action level of 15 ppb is established for 1-liter samples taken by public water suppliers in high-risk residences. If more than 10 percent of the samples at residences exceed 15 ppb, system-wide corrosion control treatment may be necessary. It is important to note that the testing protocol used by public water suppliers is aimed at identifying system-wide problems rather than problems at outlets in individual buildings. Moreover, the protocols for sample size and water retention time are different.

corrective measures can be taken. EPA has established the 20 ppb trigger for follow-up testing to ensure that the sources of lead contamination in drinking water outlets are identified.

As with initial samples, follow-up samples are to be taken before a facility opens and before any water is used. Follow-up samples generally involve the collection of water from an outlet where 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. A comparison of initial and follow-up samples will help to assess where the lead may be getting into the drinking water. See Exhibits 4.2 through 4.8 for follow-up sampling instructions for various types of outlets.

After follow-up sampling, additional samples from the interior plumbing within the building are also often necessary to further pinpoint the sources of lead contamination. See Exhibit 4.9 for instructions for additional sampling.

4.4.3 Initial and Follow-Up Sampling Protocol

The protocol for collecting initial and follow-up samples varies by type of drinking water outlet. The initial and follow-up testing protocol and the interpretation of test results is described in Exhibits 4.3 thorough 4.9 for the following locations and types of outlets:

- **Service connections and water mains**
- **Drinking water fountains** *(four types)*
  - Bubblers or drinking water fountains (without central chillers): water is supplied to the bubbler or fountain directly from the building's plumbing.
  - Bubblers or drinking water fountains (with central chillers): a central chiller unit cools water for a number of drinking water fountains or bubblers in the building.
  - Water coolers: devices are equipped with their own cooling and storage systems; water is supplied to the device from the building's plumbing.
  - Bottled water dispensers: type of water fountain whose water is supplied from bottled water.[2]
- **Ice making machines**

[2] The Food and Drug Administration (FDA) regulates the interstate sale of bottled water and has established a 5 ppb standard for lead in bottled water. EPA recommends that you contact your distributor for written assurance that the bottled water does not exceed Federal or State bottled water standards.

- **Water faucets**

- **Interior plumbing**

Please note that sampling ID codes have been indicated in the descriptions of the sampling protocol for each outlet type. These sampling ID codes have been included for illustrative purposes only. When you conduct testing in your facility, you should assign your own unique numbers to every sample you collect.

Following the instructions for the above water outlet locations are instructions for conducting sampling of the interior plumbing of buildings (Exhibit 4.9). Instructions are included for sampling laterals, loops and headers, and riser pipes. These types of samples are necessary if follow-up outlet samples show lead levels above 20 ppb.

Exhibit 4.2 provides an overview of the sampling process in a flow chart format.

As discussed in section 4.1, you may wish to modify sampling recommendations to suit your site conditions. For example, if you believe that flushing an outlet for 30 seconds prior to taking a follow-up sample is excessive, you may wish to calculate a more accurate time estimate. This could be done by:

- Calculating the pipe volume in gallons between the outlet and the location in the plumbing that you want to sample.

- Measuring the outlet flow in gallons per minute.

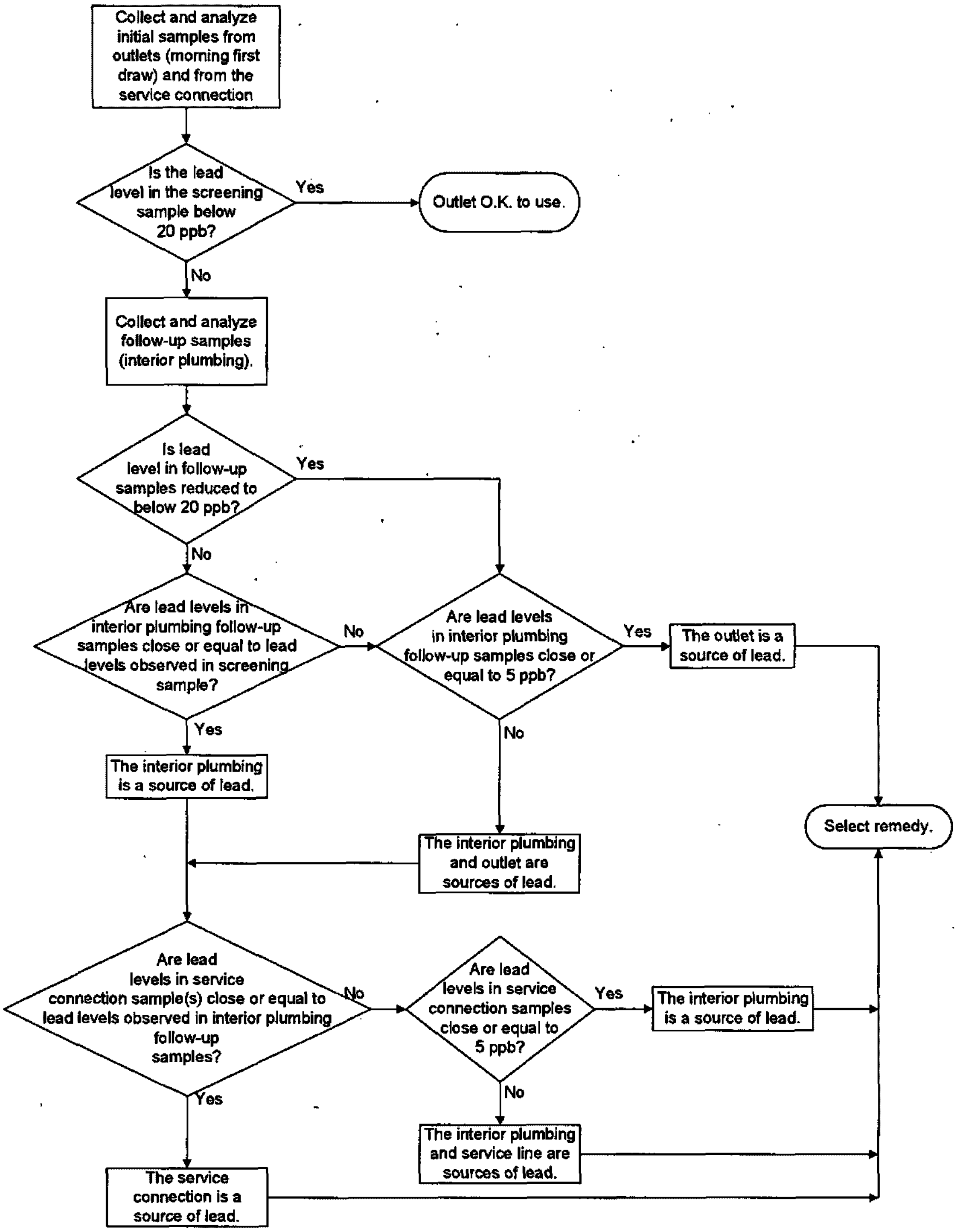
- The length of time for flushing can be determined by dividing the pipe volume in gallons by the outlet flow in gallons per minute.

Pipe volumes per foot of pipe length for various pipe sizes are shown in the Exhibit 4.1 below.

Exhibit 4.1: Pipe Volumes for Copper Pipe

Nominal Pipe Diameter (inches)	Approximate Capacity (gallons per foot of length)	
	Type K Copper (soft)	Type L Copper (rigid)
3/8	0.0066	0.0075
1/2	0.0113	0.0121
3/4	0.0226	0.0251
1	0.0404	0.0429
1 1/4	0.0632	0.0653
1 1/2	0.0895	0.0924
2	0.1566	0.1607
2 1/2	0.2412	0.2479
3	0.3448	0.3538

Exhibit 4.2: Sample Strategy Flowchart



4.4.4 Sampling for Other Parameters

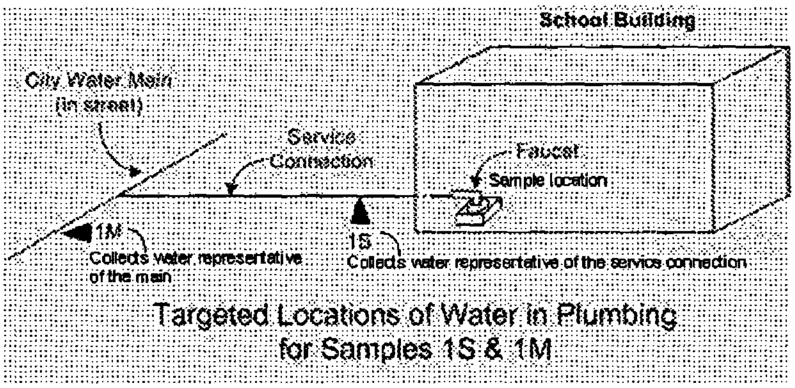
In addition to monitoring for lead, you may wish to monitor for other parameters that may provide an indication of problems in your plumbing. Some of these are listed in the following table:

Contaminant	Limit	Concern
Cadmium	5 ppb	A regulated toxic metal found in low levels in galvanized pipe. The maximum allowable level is 5 ppb. However, the presence of cadmium at any level indicates that corrosive conditions may exist in the plumbing.
Color	15 color units	An aesthetic parameter that may indicate the presence of iron oxides. Iron oxides are often present in iron or steel pipe as a result of corrosive conditions.
Copper	1300 ppb	A regulated toxic metal used to make copper piping. The presence of copper in water samples taken from copper piping is not unusual, but higher levels indicate that corrosive conditions may be a concern.
Iron	300 ppb	An aesthetic parameter that is indicative of corrosive conditions at higher levels. See also color and turbidity. (Galvanized pipe is typically made of iron.)
Turbidity	1 turbidity unit	A measurement of the clarity of water. Higher turbidity values may indicate the presence of iron oxides. Iron oxides are often present in iron or steel pipe as a result of corrosive conditions.
Zinc	5000 ppb	An aesthetic parameter that is indicative of corrosive conditions at higher levels. Zinc is used in making galvanized piping products. The presence of zinc in water samples taken from galvanized piping is not unusual, but higher levels indicate that corrosive conditions may be a concern.

Exhibit 4.3: Service Connection Sampling

Lead pipes are still used for service connections in some locations. Other materials used for service connections include copper, galvanized steel, plastic, and iron. Lead service connections can produce significant lead levels in your drinking water.

To test water in your service connection, locate the tap closest to the service connection. This is especially important for larger facilities where more than one service connection is present.



Sample Collection Procedures:

- **Sample 1S (Service Connection)**

Take this sample before the facility opens. Note that this is not an initial first-draw sample. Open the cold water tap closest to the service connection. Let the water run, and feel the temperature of the water. Depending upon the temperature of your utility's water and the temperature of the room, you may feel the water temperature change as the water from the service connection enters the building. However, it is possible that the water in the service connection and the building are close to the same temperature. Therefore, you should collect the sample immediately after a temperature change is detected, or after 30 seconds. Flushing removes the water that was in the facility's interior plumbing and allows sampling of the water that was in the service connection.

- **Sample 1M (Water Main)**

This sample is representative of the water that is provided by the distribution main. Take the sample from the same location as sample 1S. Let the water run, and feel the temperature of the water. If you can feel a change in water temperature, allow the water to run an additional 3 minutes after the temperature changes and then collect the sample. If you cannot feel a change in temperature, allow the water to run for 3 minutes and 30 seconds.

If possible, you should take this sample from a faucet rather than a drinking fountain because of the limited flow that is normally provided by a drinking fountain. Also, a change in temperature may be difficult to detect if the sample is taken from a water cooler (see the discussions for Samples 1S and 1M below).

Interpreting Test Results:

- If the lead level of Sample 1S (service connection) significantly exceeds 5 ppb (for example, 10 ppb) and is higher than in sample 1M, lead is contributed from the service connection. Check for the presence of a lead service connection by scratching it with a knife or key. (Lead test kits are available from water testing and laboratory supply companies and are relatively inexpensive.) Lead is soft and dull gray in appearance. When scratched, it will be shiny. In the absence of a lead service connection, lead goosenecks or other materials containing lead may be the source of the contamination. Usually, no significant amount of lead (above 5 ppb) comes from the public water system.

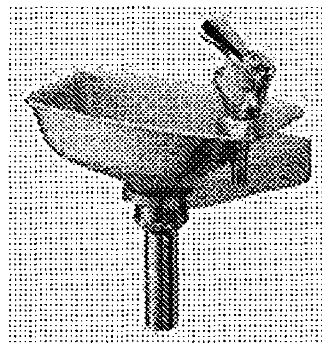
- If the lead level of Sample 1M (water main) significantly exceeds 5 ppb (for example, 10 ppb), lead in the water may be attributed to the source water, sediments in the main, or to lead in the distribution system such as from lead joints used in the installation or repair of cast iron pipes.

- If the lead level of Samples 1S and 1M are very low (close to 5 ppb), very little lead is being picked up from the service line or the distribution main.

For example scenarios of different water sample results, please see Appendix G.

Exhibit 4.4: Drinking Water Fountains: Bubblers

Do not close the shut-off valves to the water fountains to prevent their use prior to sample collection. Minute amounts of scrapings from the valves will produce inaccurate results showing higher than actual lead levels in the water. Take all samples with the taps fully open.



One Style of Drinking Water Fountain

Sample Collection Procedures:

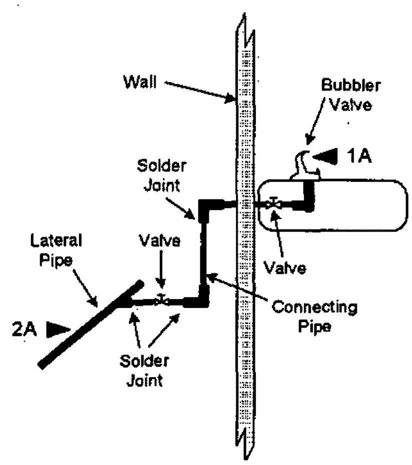
- **Initial Screening Sample 1A**

This sample is representative of the water that may be consumed at the beginning of the day or after infrequent use. It consists of water that has been in contact with the bubbler valve and fittings and the section of plumbing closest to the outlet of the unit.

Take this sample before the facility opens and before any water is used. Collect the water immediately after opening the valve without allowing any water to run into the drain. Take follow-up samples from those bubblers where test results indicate lead levels over 20 ppb.

- **Follow-Up Sample 2A**

This sample is representative of the water that is in the plumbing upstream from the bubbler (from the bubbler back toward the service connection and the water main). Take this sample before the facility opens and before any water is used. Let the water from the fountain run for 30 seconds before collecting the sample. If several bubblers are served by a central chiller, samples should be taken from different bubblers on different days.



Targeted Locations of Water in Plumbing for Samples 1A & 2A

Note: All the samples are collected at the outlet. The sample numbers indicate what water is being targeted for testing.

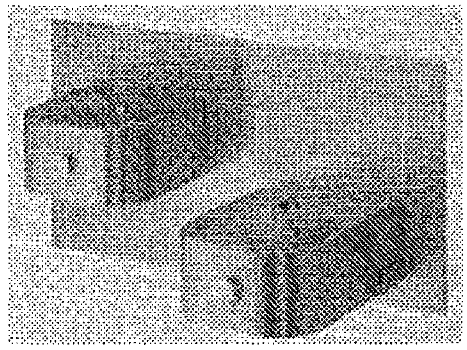
Interpreting Test Results:

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

- If the lead level in Sample 1A is higher than that in Sample 2A, a portion of lead in the drinking water is contributed from the bubbler.

- If the lead level in Sample 2A is very low (close to 5 ppb), very little lead is picked up from the plumbing upstream from the outlet. The majority or all of the lead in the water is contributed from the bubbler.

- If the lead level in Sample 2A significantly exceeds 5 ppb (for example, 10 ppb), lead in the drinking water is also contributed from the plumbing upstream from the bubbler.



Fountains Connected to a Central Chiller

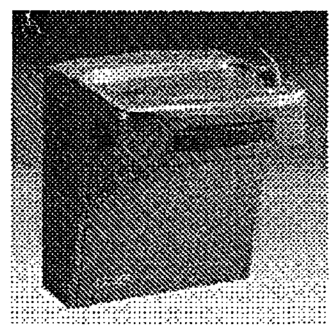
- If the lead level in Sample 2A exceeds 20 ppb, EPA recommends sampling from the header or loop supplying water to the lateral to locate the source of the contamination. *(Sampling instructions for interior plumbing can be found in Exhibit 4.9.)*

For example scenarios of water sample results and possible solutions, see Appendix G.

Exhibit 4.5: Drinking Water Fountains: Water Coolers

Do not close the valves to the water fountains to prevent their use prior to sample collection. Minute amounts of scrapings from the valves will produce inaccurate results showing higher than actual lead levels in the water. Take all samples with the taps fully open.

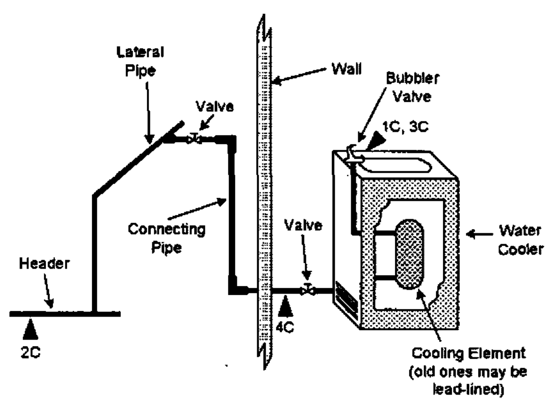
Sample Collection Procedures:



Wall-Mounted Cooler

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

Prior to testing, check the make and model numbers of your water coolers and compare them to EPA's listing of coolers that have lead parts or lead-lined tanks *(see Appendix D for a summary of the water cooler issues and EPA's list of affected coolers).* If you have a Halsey Taylor cooler that is on EPA's list of coolers with lead-lined tanks, consult Halsey Taylor for information on their replacement/refund program and associated testing directions. Contact information is provided in Appendix D.



Targeted Locations of Water in Plumbing for Samples 1C - 4C

Note: The valve shown upstream of the water cooler may be located inside the cooler.

Regardless of whether your water cooler appears on EPA's listing, initial testing should be conducted.

- **Initial Screening Sample 1C**

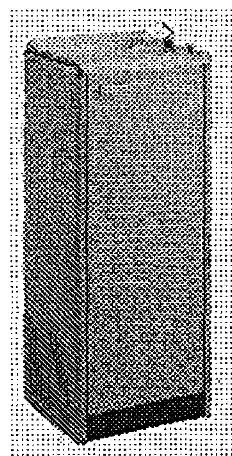
  This sample is representative of the water that may be consumed at the beginning of the day or after infrequent use. (In areas of infrequent use, the water may not have been used in more than 18 hours. This is acceptable if this is representative of the normal water consumption pattern.) The sample consists of water that has been in contact with the interior plumbing, the valve and fittings, the storage unit, and the section of plumbing closest to the outlet of the unit.

Take this sample before the facility opens and before any water is used. Collect the water immediately after opening the faucet without allowing water to waste. Take follow-up samples from water coolers whose test results indicate lead levels greater than 20 ppb.

When conducting follow-up testing with water coolers you should be aware that some water coolers manufactured before 1988 may have storage tanks lined with materials containing lead. You should contact the manufacturer of any water cooler units you have purchased or are planning to purchase for written guarantees that the unit is lead-free. *A list of makes and model numbers of coolers that contain lead has been prepared by EPA and is summarized in Appendix D.*

- **Follow-Up Sample 2C**

This water sample is representative of the water that is in contact with the header or riser piping upstream of the cooler. Take this sample after the facility closes. Let the water from the fountain run for 15 minutes before collecting the sample. You must flush the cooler for 15 minutes to ensure that no stagnant water is left in the storage unit.



Floor-Mounted Cooler

- **Follow-Up Sample 3C**

Take this sample before the facility opens and before any water is used. This sample must be taken the morning after you collect Follow-Up Sample 2C. Collect the water immediately after opening the faucet without allowing any water to waste.

Because the water in the cooler was flushed the previous afternoon, this sample is representative of the water that was in contact with the cooler overnight, not in extended contact with the plumbing upstream. As such, it may differ from Initial Screening Sample 1C.

Interpreting Test Results:

- If the lead level in Sample 3C is higher than that in Sample 2C, the water cooler may be contributing lead to the water.

- If the lead level in Sample 3C is higher than that in Sample 2C AND the lead level in Sample 1C is higher than that in Sample 3C, the plumbing upstream from the water cooler may also be contributing lead to the water.

- If the lead level in Sample 3C is identical or close to that of Sample 2C, the water cooler probably is not contributing lead to the water.

- If the lead level in Sample 1C is higher than that in Sample 3C AND if the lead levels in Sample 2C and 3C are similar, the plumbing upstream from the cooler or the plumbing connection leading to the cooler, or both, is contributing lead to the water.

- If the lead level in Sample 2C is in excess of 20 ppb and is equal to or greater than the lead levels in Samples 1C and 3C, the source of the lead may be sediments contained in the cooler storage tank, screens, or the plumbing upstream from the cooler.

To verify the source of lead, take the following steps:

(1) Take a 30-second flushed sample from a tap upstream from the cooler or compare Sample 2C results with the results obtained from follow-up samples taken from outlets upstream from the cooler. If low lead levels are found in these samples (close to 5 ppb), the source of lead may be sediments in the cooler or the plumbing connecting the cooler to the lateral or lead solder in the plumbing between the taps.

(2) If the flushed samples from the upstream outlets have lead levels in excess of 5 ppb, then the cooler and the upstream plumbing may both contribute lead to water.

- **Follow-Up Sample 4C**

To confirm whether the cooler is the source of lead, take Follow-Up Sample 4C.

Turn off the valve leading to the cooler. Disconnect the cooler from the plumbing and look for a screen at the inlet. Remove the screen. If there is debris present, check for the presence of lead solder by sending a sample of the debris to the laboratory for analysis.

Some coolers also have a screen installed at their outlet. Carefully remove the bubbler outlet by unscrewing it. Check for a screen and debris and have a sample of any debris analyzed.

Some coolers are equipped with a drain valve at the bottom of the water reservoir. Water from the bottom of the water reservoir should be sampled and any debris analyzed.

Collect Sample 4C from the disconnected plumbing outlet in the same manner as you collected Sample 1C. Compare the results from Sample 4C to the other sample results.

Interpreting Additional Water Cooler Test Results:

- If the lead level in Sample 4C is less than 5 ppb, then lead is coming from the debris in the cooler or the screen.
- If the lead level in Sample 4C is significantly higher than 5 ppb, the source of lead is the plumbing upstream from the cooler or from debris in the cooler or screen.
- If the lead level in Sample 4C is significantly higher than 5 ppb, but less than Sample 1C, the source of lead is the plumbing upstream from the cooler and/or from debris in the cooler or screen.

For example scenarios of water sample results and possible solutions, see Appendix G.

Exhibit 4.6: Drinking Water Fountains: Bottled Water Dispensers

Note: The Food and Drug Administration (FDA), regulates the interstate sale of bottled water and has established a 5 ppb standard for lead in bottled water. EPA recommends that you contact your distributor for written assurance that the bottled water does not exceed Federal or State bottled water standards.

Sample Collection Procedures:

- **Initial Screening Sample 1D**

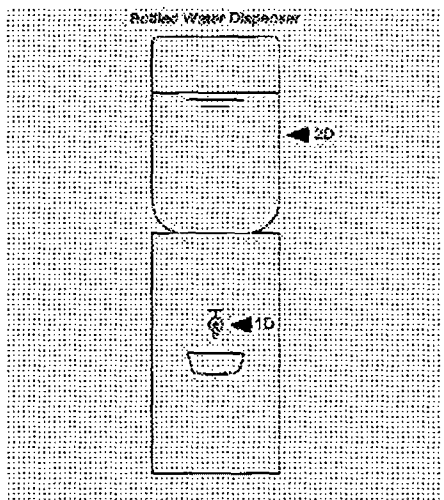
  This sample is representative of the water that may be consumed at the beginning of the day or after infrequent use. It consists of water that has been in contact with the dispenser valve and fittings incorporated in the outlet of the unit.

  Take this sample before the facility opens and before any water is used. Collect the water immediately after opening the faucet without allowing any water to waste. Take follow-up samples from those bottled water dispensers where test results indicate lead levels over 20 ppb.

Bottled Water Dispenser

- **Follow-Up Sample 2D**

  Collect this sample directly from the bottle that supplies the water to the unit. This will enable you to determine the source of lead in the water.



Targeted Locations of Water in Plumbing for Samples 1D & 2D

Interpreting Test Results:

- If the sample contains lead, contact the water supplier and/or the manufacturer of the dispenser to ask their recommendations.

- If the lead level in Sample 1D is higher than that in Sample 2D, lead may be coming from the dispenser unit.

- If the lead level in Sample 2D is identical or close to that in Sample 1D, the source of lead is the bottled water.

Note: *Many dispensers have a hot and cold tap. Water from both taps is meant to be directly consumed, therefore, both taps should be sampled. However, you may wish to sample the hot water tap on a separate day.*

For example scenarios of water sample results and possible solutions, see Appendix G.

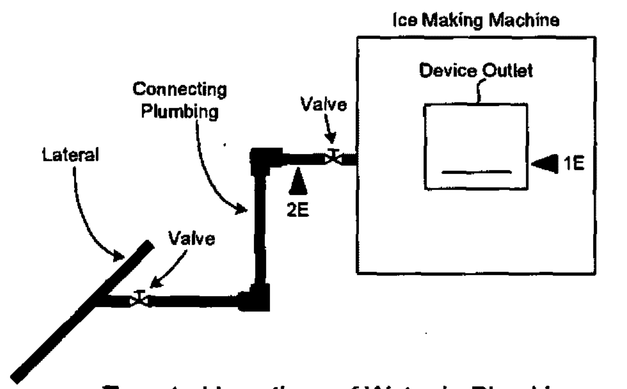
Exhibit 4.7: Ice Making Machines

Sample Collection Procedures:

- **Initial Screening Sample 1E**

  Fill a suitable container (250 mL or larger, wide-mouthed bottle or other container) provided by the laboratory at least three-quarters full of ice. Do not touch the ice with your hands. Use the non-metal scoop or disposable plastic gloves provided by the laboratory to place the ice in the container.

  If the lead level in Sample 1E exceeds 20 ppb, collect a follow-up sample to determine if the source of the lead is the plumbing or the ice making machine itself.



Targeted Locations of Water in Plumbing for Samples 1E & 2E

- **Follow-Up Sample 2E**

  Disconnect the ice maker from the plumbing and look for a screen at the inlet. Remove the screen. If debris is present, forward a sample of the debris to the laboratory for analysis and clean out the remaining debris. The laboratory will determine whether lead solder is present. Clean the screen routinely to avoid accumulations of lead in the sediment.

  Collect the sample from the disconnected plumbing as close to the ice maker as possible. Fill the sample container with 250 mL of water. If no tap is available, contact the ice machine manufacturer for recommendations that will minimize disruption of existing plumbing. Adding taps or valves could add new sources of lead to the plumbing, even if the new devices are lead-free and meet NSF Standard 61, Section 9. If a sample tap or valve is available, collect the sample immediately after opening the tap or valve.

Interpreting Test Results:

- If the lead level in Sample 2E is close to 5 ppb, the source of the lead in the ice is the ice maker.

- If the lead level in Sample 2E significantly exceeds 5 ppb (for example, 10 ppb), lead is also contributed from the plumbing upstream from the ice maker.

- If the lead level in Sample 2E exceeds 20 ppb, EPA recommends sampling from the distribution system supplying water to the ice maker. *Refer to Exhibit 4.9 on Sampling Interior Plumbing for instructions.*

For example scenarios of water sample results, please see Appendix G.

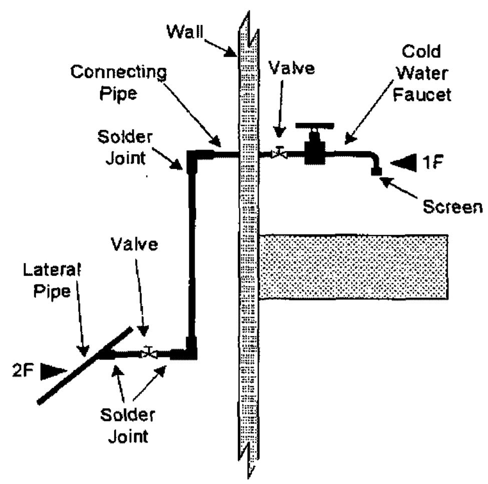
Exhibit 4.8: Water Faucets (Taps)

Sample Collection Procedures:

- **Initial Screening Sample 1F**

  This sample is representative of the water that may be consumed at the beginning of the day or after infrequent use. It consists of water that has been in contact with the fixture and the plumbing connecting the faucet to the lateral pipes.

  Take this sample before the facility opens and before any water is used. If the tap has an aerator, remove, clean, and replace it prior to collecting the sample. Using the cold water tap, collect the water immediately after opening the faucet without allowing any water to go to waste. Follow-up samples should be taken from those water faucets where initial screening test results indicate lead levels over 20 ppb.



Cold Water Faucet (Tap)

Targeted Locations of Water in Plumbing for Samples 1F & 2F.

- **Follow-Up Sample 2F**

  This sample is representative of the water that is in the plumbing upstream from the faucet. Take this sample before school opens and before any water is used. Let the water from the faucet run for 30 seconds before collecting the sample.

Interpreting Test Results:

- If the lead level in Sample 1F is higher than that in Sample 2F, the source of lead is the water faucet and/or the plumbing upstream from the faucet.

- If the lead level in Sample 2F is very low, close to 5 ppb, very little lead is coming from the plumbing upstream from the faucet. The majority or all of the lead in the water is from the faucet and/or the plumbing connecting the faucet to the lateral.

- If the lead level in Sample 2F significantly exceeds 5 ppb (for example, 10 ppb), lead may be contributed from the plumbing upstream from the faucet.

For example scenarios of water sample results and possible solutions, see Appendix G.

Exhibit 4.9: Sampling Interior Plumbing

In general, if lead levels exceed 20 ppb in follow-up samples taken from drinking water outlets, additional samples from upstream sample sites in the interior plumbing should be collected. EPA recommends that water samples from each lateral, header and riser (where applicable) be collected because use patterns may vary among locations within a building. The configuration of interior plumbing will vary depending on the layout of a given building. Construction materials may also vary, especially in larger buildings where additions and repairs have been made to the original structure. *See Exhibits 4.10 and 4.11 for simplified diagrams of the interior plumbing in single-level and multi-level buildings.*

Sampling should proceed systematically upstream from follow-up sample sites that exceed 20 ppb. *(However, you do not have to sample at upstream sites where follow-up samples have already been taken.)* The goal of this sampling effort is to isolate those sections of the interior plumbing that contribute lead to the water. This is achieved by comparing the results of interior plumbing samples with each other, and with the results of previously collected follow-up samples.

Developing procedures from upstream sampling from laterals, headers and risers can be difficult because of the wide variation in plumbing configurations among facilities. As discussed in 4.4.3, the sampling procedures in this manual were developed for typical configurations that may not be similar to your facility. You may wish to either develop your own sampling procedures using the guidance provided in 4.4.3, or retain a consultant for guidance in this process.

Laterals

A lateral is a plumbing branch between a fixture or group of fixtures (e.g., taps, water fountains etc.) and a header.

Sample Collection Procedures:

- **Sample 1G** (lateral)

  Open the outlet that has been designated as the sample site for the lateral pipe. Let the water run for 30 seconds before collecting the sample. Collect a 250 mL sample. The purpose of flushing the water is to clear the plumbing between the sample site and the lateral pipe. This action will ensure collection of a representative sample.

  Note: Sample 1G corresponds to follow-up samples taken from other outlets such as 2A, 2E and 2F. Compare the results of these samples from outlets upstream and downstream of Sample 1G for additional information on the source of the lead within the interior plumbing. (As noted above, you do not have to take sample 1G at sites where follow-up samples have already been taken. The previous results are adequate.)

Interpreting Test Results:

- If the lead level in Sample 1G exceeds 20 ppb, collect additional samples from the plumbing upstream where samples have not been previously taken (i.e., from header supplying water to the lateral, the riser pipe, or the service connection).

  Note: High lead levels may also be caused by recent repairs and additions using lead solders or by sediments and debris in the pipe. Debris in the plumbing is most often found in areas of infrequent use, and a sample should be sent to the laboratory for analysis.

- If the lead level of Sample 1G is the same as the lead level in a sample taken downstream from Sample Site 1G, lead is contributed from the lateral and/or from interior plumbing upstream from the lateral. Possible sources of lead may be the loop, header, riser pipe, or service connection.

- If the lead level in Sample 1G is very low, close to 5 ppb, the portion of the lateral upstream from Sample Site 1G and the interior plumbing supplying water to the lateral are not contributing lead to the water.

- If the lead level in Sample 1G significantly exceeds 5 ppb (for example, 10 ppb) and is less than the lead level in a sample taken downstream from Sample Site 1G, a portion of the lead is contributed downstream from the sample site.

Headers

A header is the main water supply pipe on a given floor of a building. A header supplies water to laterals. In smaller buildings, a header may be very short and/or have a relatively small diameter.

Sample Collection Procedures:

- Sample 1H (header)

  Locate the sampling point furthest from the service connection or riser pipe (see discussion of riser pipes on the next page) on the floor. You should try to take this sample from a faucet to provide adequate flushing through the tap. Open the faucet and let it run for 30 seconds before collecting this sample. Fill the sample container with 250 mL of water. The purpose of flushing the water is to clear the faucet and plumbing between the sample site and the header pipe.

Interpreting Test Results:

- If the lead level is over 20 ppb, collect additional samples from the plumbing upstream supplying water to header. Compare the sample results with those taken from the service line or the riser pipe that supplies water to the header.

  High lead levels may also be caused by recent repairs and additions using lead solders or by sediment and debris in the pipe. Debris in the plumbing is most often found in areas of infrequent use, and a sample should be sent to the lab for analysis. The laboratory will provide instructions on how to package and handle the sediment.

- If the lead level of Sample 1H is equal to the lead level in a sample taken downstream from Sample Site 1H, the lead is contributed from the header and/or the loop and/or from interior plumbing upstream from the header or loop. Possible sources of lead may be the header, riser pipe, or service connection.

- If the lead level in Sample 1H is close or equal to 5 ppb, the portion of the header upstream from Sample Site 1H and the interior plumbing supplying water to the header are not contributing lead to the drinking water. The source of lead is downstream from the sample site.

- If the lead level in Sample 1H significantly exceeds 5 ppb (for example, 10 ppb) and is less than the lead level in a sample taken downstream from Sample Site 1H, a portion of the lead is contributed downstream of the sample site.

Riser Pipes

A riser is the vertical pipe that carries water from one floor to another.

Sample Collection Procedures:

- **Sample 1J**

  Open the tap closest to the riser pipe. Let the water run for 30 seconds before collecting the sample. Fill the sample container with 250 mL of water. The purpose of flushing is to clear the faucet and plumbing between the sample site and the riser pipe.

Interpreting Test Results:

- If the lead level in Sample 1J exceeds 20 ppb, collect additional samples from the plumbing upstream from the riser. High lead levels in the riser pipes may also be caused by recent repairs and additions using lead solder.

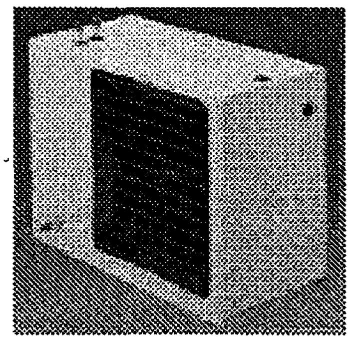
- If the lead level of Sample 1J equals the lead level in a sample taken downstream from Sample Site 1J, the source of the lead is the riser pipe and/or the plumbing and service connection upstream from the riser pipe.

- If the lead level in Sample 1J is close or equal to 5 ppb, the portion of the riser pipe and plumbing upstream from Sample Site 1J and the service connection are not contributing lead to the water. The source of the lead is downstream of the sample site.

- If the lead level in Sample 1J significantly exceeds 5 ppb (for example, 10 ppb) and is less than the lead level in a sample taken downstream from Sample Site 1J, a portion of the lead is contributed downstream from the sample site.
  For example scenarios of water sample results and possible solutions, see Appendix G.

Sample Collection Procedures – Central Chiller Unit:

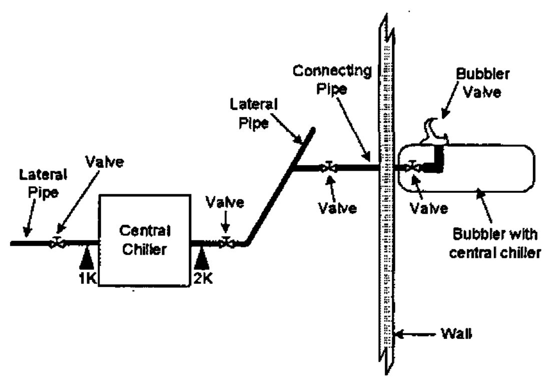
- **Follow-Up Sample 1K**



Central Chiller Unit

  This sample is representative of water that has been in contact with the plumbing supplying water to the chiller. Take this sample before the facility opens and before any water is used. Take the sample from a tap or valve as close to the inlet of the chiller as possible. If no tap is available, contact the chiller manufacturer for recommendations that will minimize disruption of existing plumbing. Adding taps or valves could add new sources of lead to the plumbing, even if the new devices are lead-free and meet,NSF Standard 61, Section 9. If a sample tap or valve is available, collect the sample immediately after opening the tap or valve, without allowing any water to waste.

- **Follow-Up Sample 2K**



Targeted Locations of Water in Plumbing for Samples 1K & 2K

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

  Take the sample from a tap or valve as close to the outlet of the chiller as possible. If no tap is available, contact the chiller manufacturer for recommendations that will minimize disruption of existing plumbing. Adding taps or valves could add new sources of lead to the plumbing, even if the new devices are lead-free and meet NSF Standard 61, Section 9. If a sample tap or valve is available, collect the sample immediately after opening the tap or valve.

Interpreting Test Results – Central Chiller Unit:

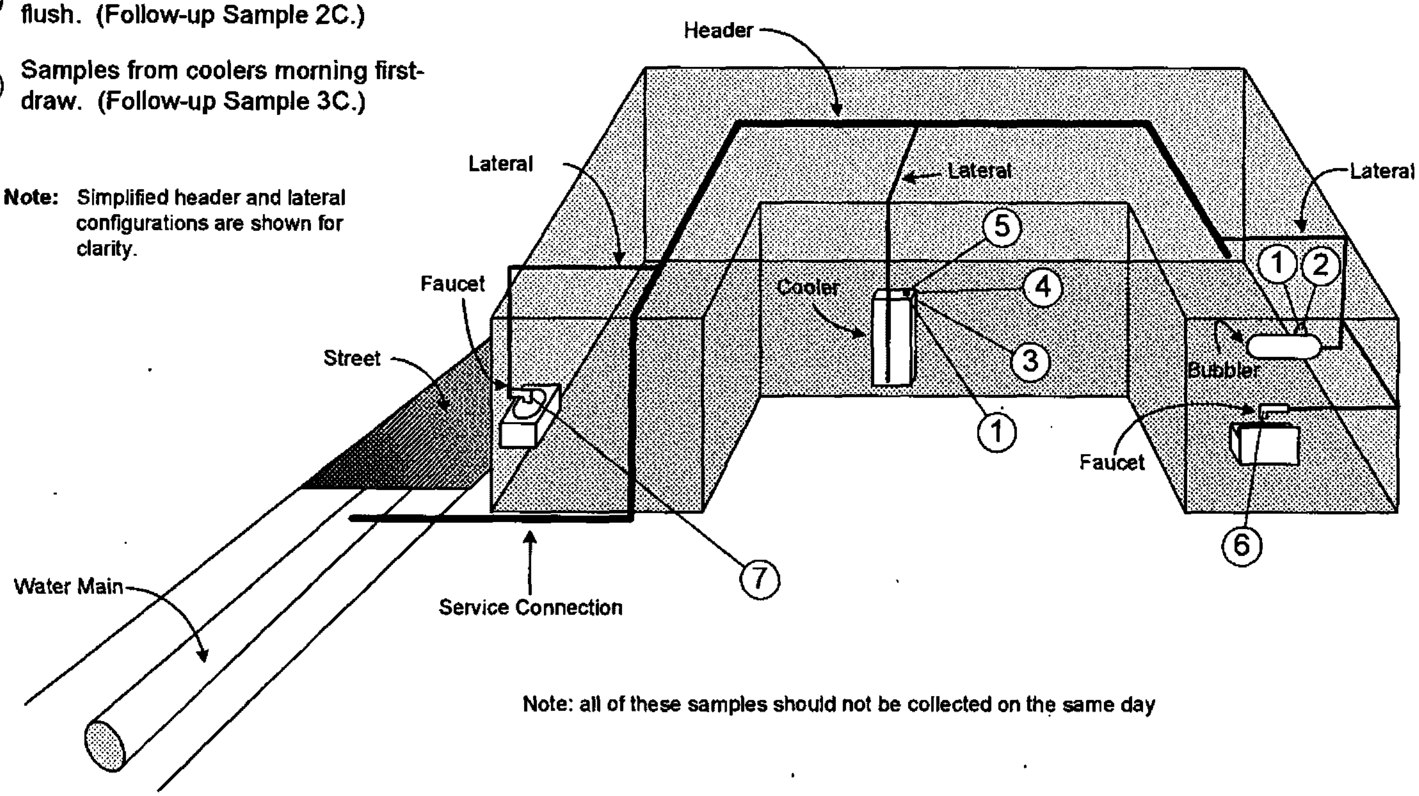
- If the lead level in Sample 2B is higher than that in Sample 4B, lead is contributed from the plumbing supplying the water from the chiller to the bubbler.
- If the lead level in Sample 4B is higher than in Sample 3B, a portion of the lead may be coming from the chiller. Note: Sludge and sediments containing high levels of lead may accumulate in chiller tanks. If the test results indicate that lead is contributed from the chiller unit, check for the presence of debris and sludge. Remove any of these materials from the chiller, flush the chiller unit, and resample the water.
- If the lead level in Sample 3B exceeds 20 ppb, EPA recommends additional sampling from the distribution system supplying water to the chiller to locate the source of contamination.
- If the lead level in Sample 3B is very low (close to 5 ppb), very little lead is picked up from the plumbing upstream from the chiller. The majority or all of the lead in the water may be attributed to the chiller and the plumbing downstream from the chiller.

For example scenarios of water sample results and possible solutions, see Appendix G.

Exhibit 4.10: Sample Sites for a Single-Level Building

1. Morning first-draw samples from coolers, faucets, bubblers, etc. (Screening Samples 1A, 1B, 1C, 1D, 1E, 1F.)
2. Samples from lateral after 30-second flush from designated outlets. (Follow-up Samples 2A, 2B, 2E, 2F, 1G.)
3. Samples from coolers after 15-minute flush. (Follow-up Sample 2C.)
4. Samples from coolers morning first-draw. (Follow-up Sample 3C.)
5. Morning first-draw from coolers at disconnected plumbing outlet. (Follow-up Sample 4C.)
6. Sample from header pipe taken from faucet farthest from service line. (Sample 1H.)
7. Sample from service line and distribution main taken from faucet closest to service line. (Samples 1M, 1S.)

Note: Simplified header and lateral configurations are shown for clarity.

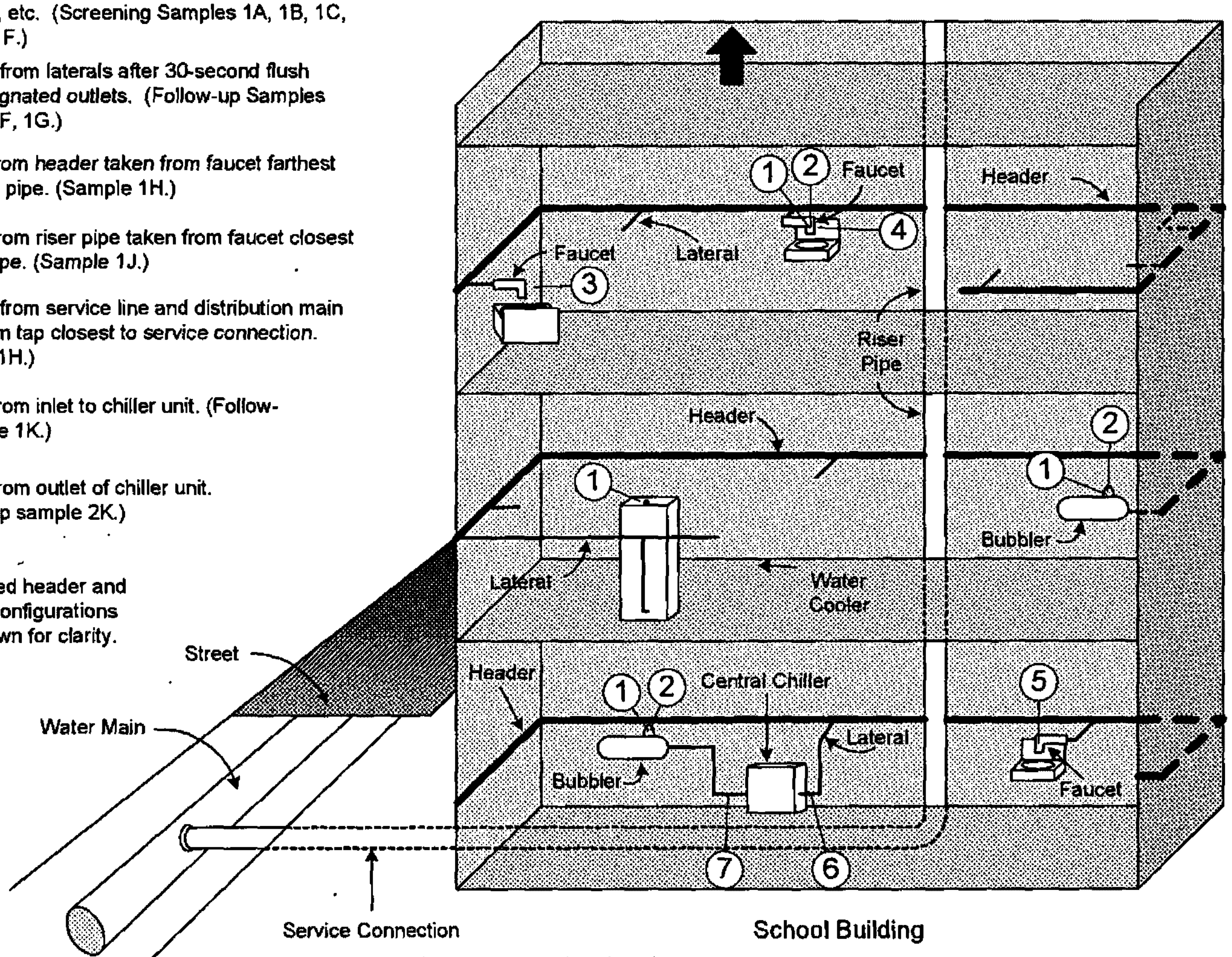


Note: all of these samples should not be collected on the same day

Exhibit 4.11: Sample Sites for a Multi-Level Building

1. Morning first-draw samples from coolers, faucets, bubblers, etc. (Screening Samples 1A, 1B, 1C, 1D, 1E, 1F.)
2. Samples from laterals after 30-second flush from designated outlets. (Follow-up Samples 2A, 2E, 2F, 1G.)
3. Sample from header taken from faucet farthest from riser pipe. (Sample 1H.)
4. Sample from riser pipe taken from faucet closest to riser pipe. (Sample 1J.)
5. Samples from service line and distribution main taken from tap closest to service connection. (Sample 1H.)
6. Sample from inlet to chiller unit. (Follow-up sample 1K.)
7. Sample from outlet of chiller unit. (Follow-up sample 2K.)

Note: Simplified header and lateral configurations are shown for clarity.



Note: all of these samples should not be collected on the same day.

5. Remedies

Solutions to lead problems typically need to be made on an interim (short-term) and on a permanent basis. Interim measures can be taken while you wait for your test results or until a permanent solution has been put in place. In addition, there are routine measures that should be taken.

Outlined below are various routine, interim and permanent remedies. To aid you in the process of selecting remedies, a case study has been included as Exhibit 5.3.

5.1 Routine Control Measures

Below are examples of routine activities that should be conducted to avoid possible exposures to lead:

- Clean debris from all accessible screens frequently. If you discover sediments in faucet screens, have the sediments tested for lead and continue to clean your screens frequently, even if the analysis finds no lead.
- Use only cold water for food and beverage preparation. Hot water will dissolve lead more quickly than cold water and is likely to contain increased lead levels. If hot water is needed, it should be taken from the cold water tap and heated on a stove or in a microwave oven.
- Run the water before drinking, so you are drinking water that has not been in contact with the faucet interior since faucets are often a major source of lead in drinking water.

5.2 Interim (Short-Term) Control Measures

Some examples of interim control measures include:

(1) **"Flush" the piping system in your building.** "Flushing" involves opening all suspect taps every morning before the facility opens and letting the water run to remove water that has been standing in the interior pipes and/or the outlets. The flushing time varies by the type of outlet being cleared. The degree to which flushing helps reduce lead levels can also vary depending upon the age and condition of the plumbing and the corrosiveness of the water. Flushing instructions are presented in Exhibit 5.1.

Exhibit 5.1: Flushing Directions by Outlet Type

Remember that each drinking water outlet should be flushed individually; flushing a toilet will not flush your water fountains. All flushing should be recorded in a log submitted daily to the office, or person, in charge of this program.

- Locate the faucet furthest away from the service line on each wing and floor of the building, open the faucets wide, and let the water run for 10 minutes. For best results, calculate the volume of the plumbing and the flow rate at the tap and adjust the flushing time accordingly. This 10-minute time frame is considered adequate for most buildings.
- Open valves at all drinking water fountains without refrigeration units and let the water run for roughly 30 seconds to one minute, or until cold.
- Let the water run on all refrigerated water fountains for 15 minutes. Because of the long time period required, routinely flushing refrigerated fountains may not be feasible. It may therefore be necessary, and more economical, to replace these outlets with lead-free, NSF-approved devices.
- Open all kitchen faucets (and other faucets where water will be used for drinking and/or cooking) and let the water run for 30 seconds to one minute, or until cold.

Advantages:

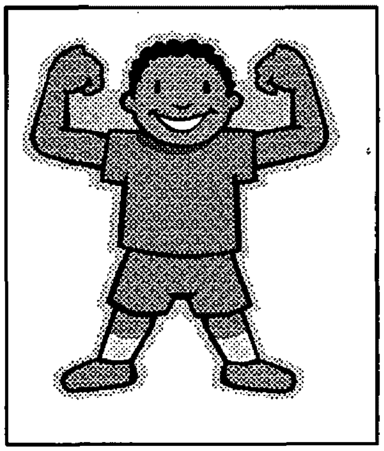
- Quickest and easiest solution to high lead levels, especially when contamination is localized in a small area or in a small building.
- Does not require installation or maintenance of water treatment equipment.
- Does not require complex instructions.

Disadvantages:

- The most obvious disadvantage to flushing is the potential waste of water involved in the flushing procedures. To minimize this disadvantage, consider the following:
  - Flush pipes only after weekends or vacations when lead levels may be highest (use only if lead levels do not exceed 20 ppb on a daily basis).
  - Thoroughly flush several designated drinking water outlets daily while taking all others temporarily out of service.
  - Use bottled water.
  - Collect water being flushed and use for non-consumptive purposes.
- Another disadvantage to flushing is the amount of time and staff needed to perform the task.

(2) **Provide bottled water.** This can be an expensive alternative but might be warranted if you expect or are aware of widespread contamination and flushing is not an option. If you use bottled water, be aware that it is not regulated by EPA but rather by the Food and Drug Administration (FDA). Your state may also regulate bottled water, and, in some instances, these standards may be more stringent than the Federal requirements. EPA recommends that you require a written statement from the bottled water distributor guaranteeing that the bottled water meets FDA and State standards.

Permanent Remedies



You can take a number of actions to permanently reduce or eliminate the sources of lead that originate in your building's plumbing. Some of these actions may allow the elimination or reduction of routine flushing or other interim measures. After obtaining an understanding of your water supply and the lead conditions in your facility (as a result of testing), you should examine the permanent treatment options and select those most appropriate to your situation. Obviously, your decision will be based on such factors as cost, likelihood of success, availability of water, and staffing requirements.

(3) **Lead levels can be reduced at the tap.** Reverse osmosis units are commercially available and can be effective in removing lead. Since these devices also tend to make the water corrosive, they should only be used when placed at water outlets. Such devices are termed point-of-use (POU) devices. There are a number of POU cartridge filter units on the market that effectively remove lead.

POU devices can be either purchased or leased. They can be relatively inexpensive ($65 to $280) or expensive (ranging from $250 to $500, and up to $2,100 for a computerized reverse osmosis treatment unit), their effectiveness varies, and they may be vulnerable to vandalism. They also require a maintenance program for regular upkeep to ensure effectiveness. Cartridge filter units need to be replaced periodically to remain effective. NSF International, an independent, third-party certification organization, has a testing program to evaluate the performance of POU devices for lead removal. Before purchasing any device, ask the manufacturer for proof of NSF approval or check by visiting the NSF Web site at http://www.nsf.org/business/search_listings/index/asp.

(4) Electrical current may accelerate the corrosion of lead in piping materials. Existing wires already grounded to the water pipes can possibly be removed by a qualified electrician, and replaced by an alternative grounding system. If your local or State building codes allow, consider finding an alternative grounding system and

have a qualified electrician make the change. Be aware that the removal of grounding from water pipes may create a shock hazard unless an acceptable, alternative ground is provided.

(5) If the sources of lead contamination are localized and limited to a few outlets, replacing these outlets may be the most practical solution. EPA worked with the plumbing industry and NSF International to develop an industry standard that is designed to minimize the amounts of lead being leached from these products. This standard is NSF Standard 61 (Sections 4, 8 and 9). Before you purchase any brass plumbing products, request information regarding compliance with this standard.

NSF Standard 61, Section 4 covers pipes, fittings and small drinking water storage devices having domestic or residential applications including the products or water contact materials of pipes, fittings, tubing, hoses, well casing, drop pipes and screens, etc.

NSF Standard 61, Section 8, covers inline mechanical devices that are used to measure or control the flow of water. Inline devices in a building used to measure or control the flow of water include water meters, building valves, check valves, meter stops, valves and fittings backflow preventers, etc. An inline device is any device installed on a service line or building distribution system downstream of the water main and before endpoint devices.

NSF Standard 61, Section 9, covers endpoint devices. These devices include kitchen and bar faucets, lavatory faucets, water dispensers, drinking fountains, water coolers, glass fillers, residential refrigerator ice makers, supply stops, and endpoint control valves. *Under the lead ban these devices must meet the requirements of this standard.* Be sure to check for compliance with NSF Standard 61, Section 9 before purchasing or installing an endpoint device.

(6) Lead pipes within the system and those portions of the lead service connections under the water supplier's jurisdiction can be replaced. Contact your public water supplier about this replacement. However, your facility may be responsible for replacing a portion of a lead service connection that is under its own administrative jurisdiction, rather than under the jurisdiction of the water supplier.

(7) In some facilities, the plumbing system might be modified so that water supplied for drinking or cooking is redirected to bypass sources of lead contamination. Before undertaking such an alternative, be certain of the sources of lead contamination. Follow-up testing would also be necessary, as with the other remedies, to ensure that the efforts result in reduced lead levels at the tap.

(8) Flushing individual problem outlets or all outlets may also represent a permanent, albeit ongoing, solution. There are advantages and disadvantages to flushing.

Flushing is often the quickest and easiest solution to high lead levels, especially when contamination is localized in a small area or in a small building. *See the Interim Remedies section above for a discussion of the advantages/disadvantages of this remedy in addition to outlet flushing instructions. You should review this information before deciding whether flushing is appropriate as a permanent remedy in your facility.*

(9) Time-operated solenoid valves can be installed and set to automatically flush the main pipes (headers) of the system. It is important to note that solenoid valves are not practical for flushing water coolers. These would need to be flushed manually by staff. *See the Interim Remedies section above for flushing instructions for water fountains.*

(10) If other treatment fails or is impractical, bottled water can be purchased for consumption by the building community. As noted under the interim remedies section above, make sure that the bottled water you select meets Federal and/or State standards for lead and other drinking water contaminants. EPA recommends that you require a written statement from the bottled water distributor guaranteeing that the lead levels in the water do not exceed 5 ppb.

(11) Make sure that any plumber who does repair or replacement work on the facility's plumbing system uses only "lead-free" solders and other materials. The 1986 Safe Drinking Water Act amendments require that only "lead-free" materials be used in new plumbing and plumbing repairs. Make sure all plumbers and other workers adhere to these requirements. These actions will ensure that new lead is not introduced into the facility's plumbing system. Report any violations of the "lead-free" requirements to your local plumbing inspector, the State drinking water program or EPA *(see Appendix C for a directory of State programs).*

Three flow charts (Exhibits 5.2a through 5.2c) illustrating the remediation process are presented below.

Exhibit 5.2a: Remediation Flow Chart (part 1)

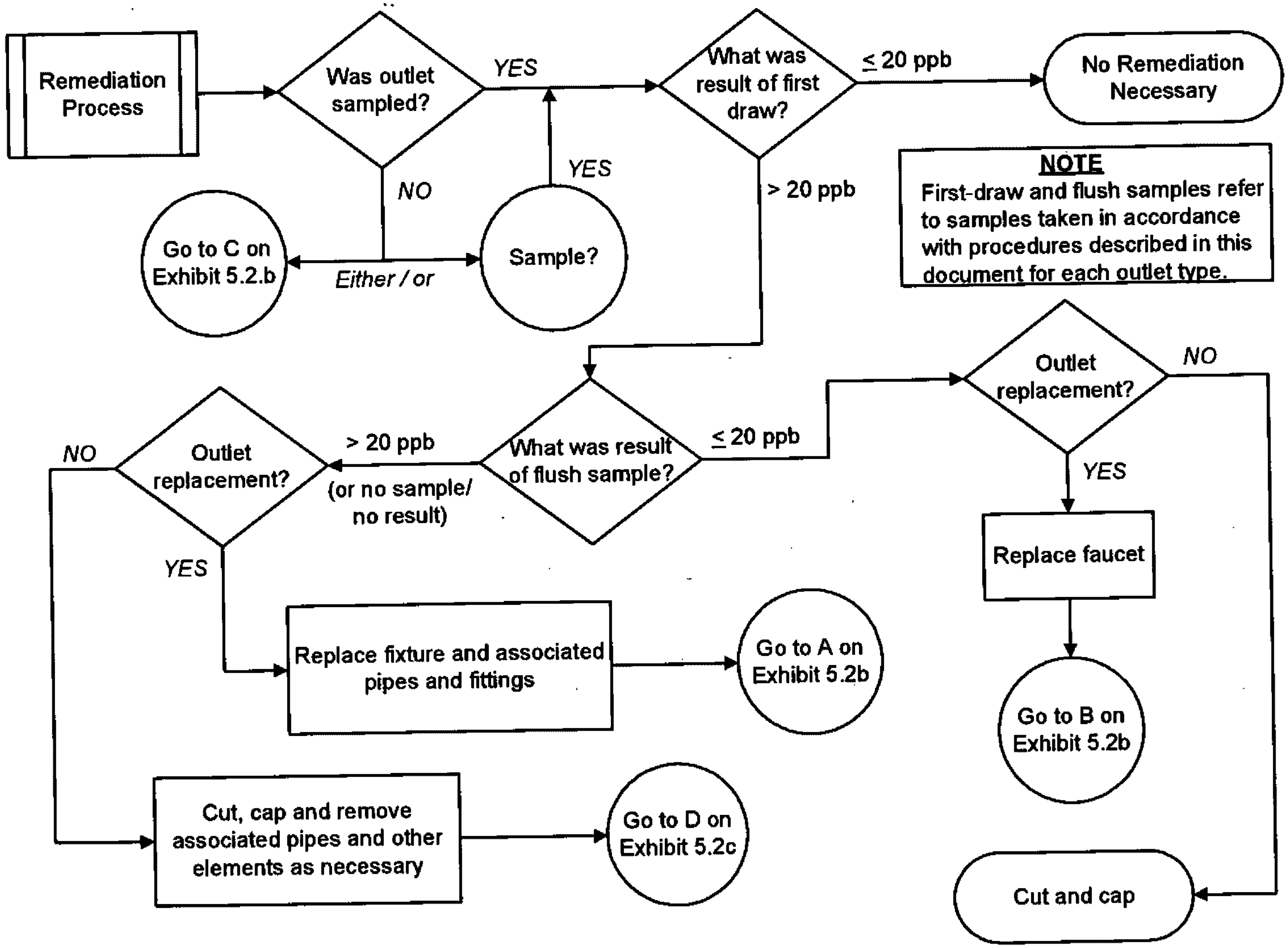


Exhibit 5.2b: Remediation Flow Chart (part 2)

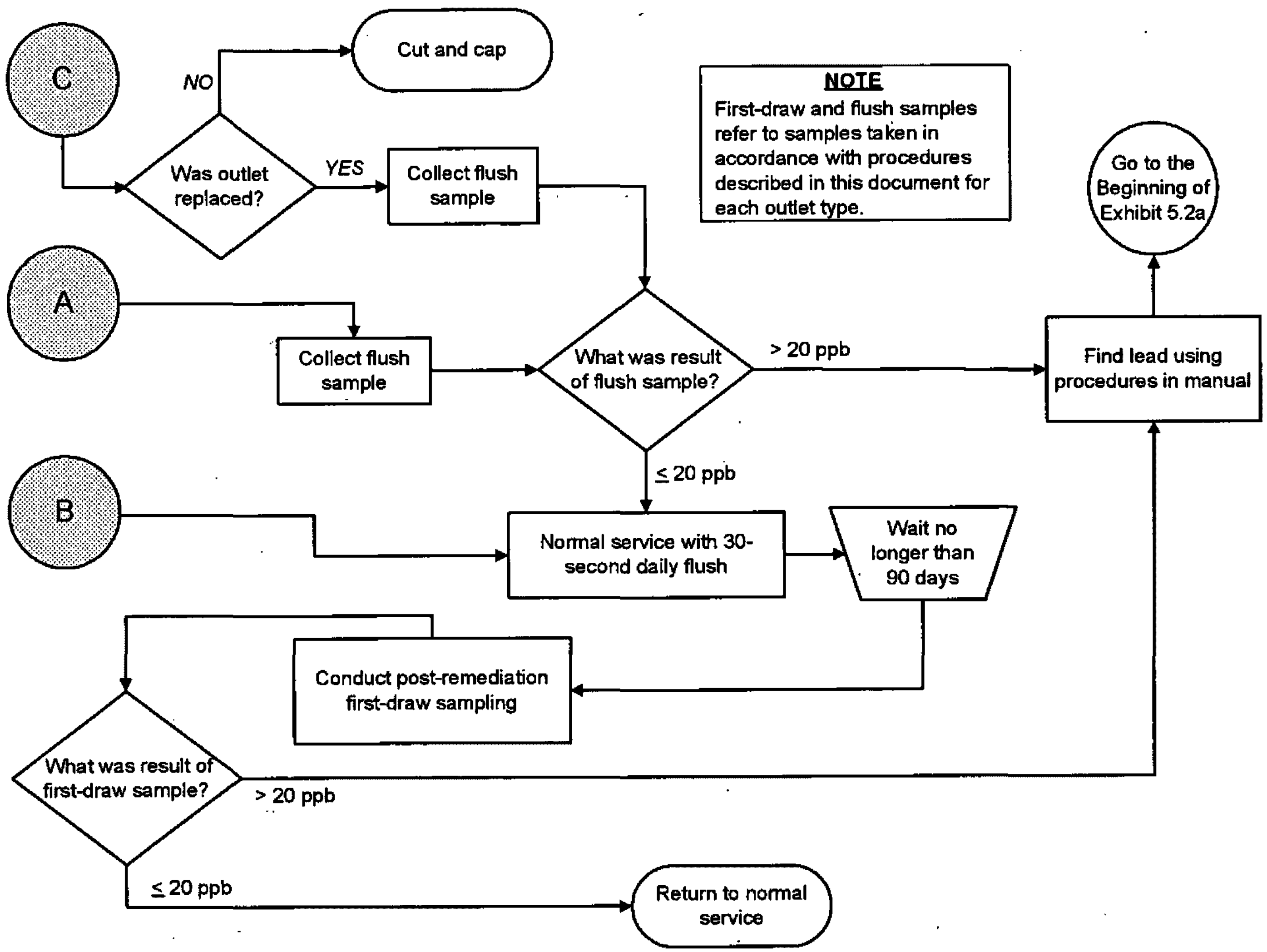


Exhibit 5.2c: Remediation Flow Chart (part 3)

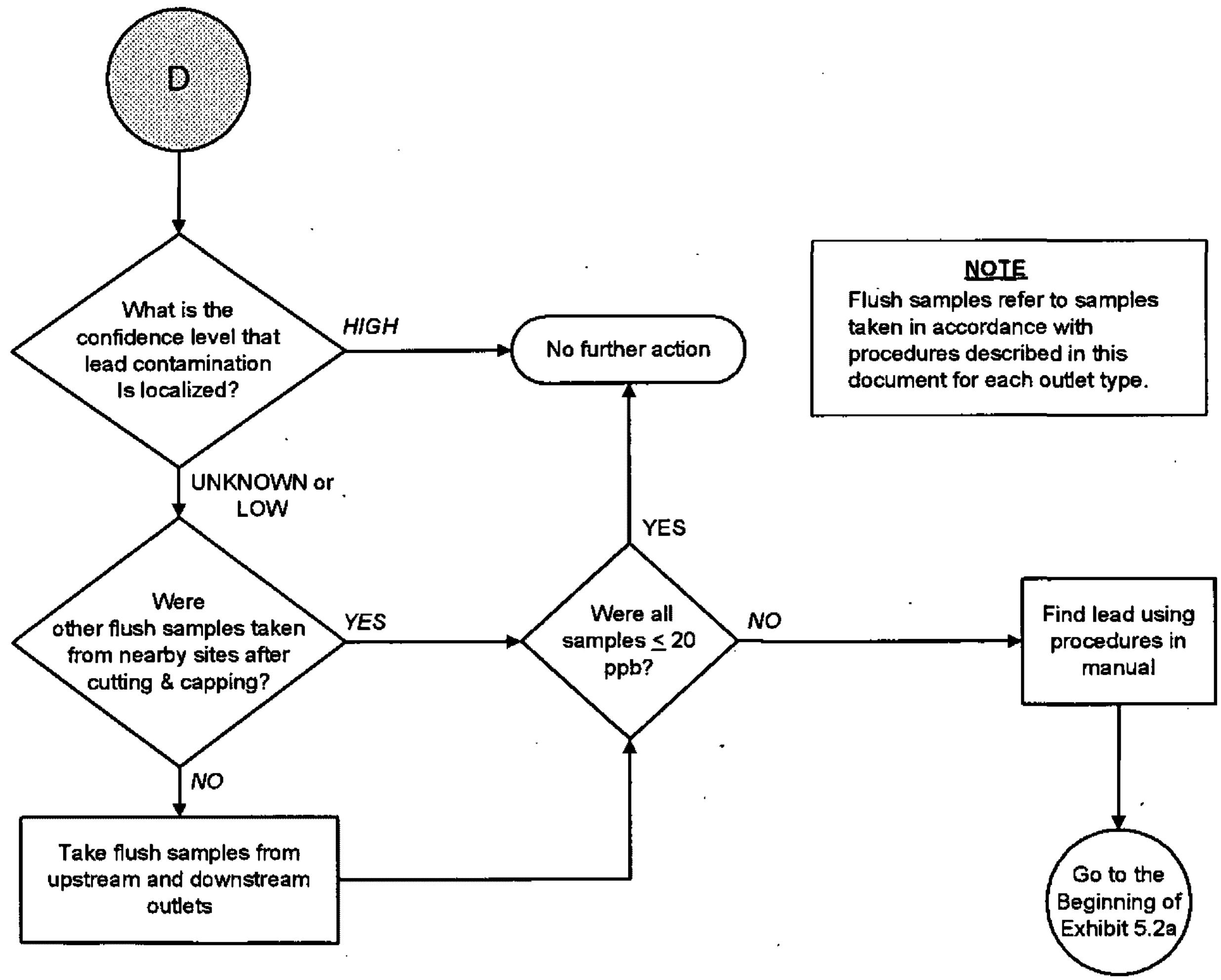


Exhibit 5.3: Case Study 1

This case study illustrates how one large school district addressed a long-standing lead problem. A variety of solutions were used to address lead problems at 50 schools in the district.

Background

Schools were sampled in 1991 and 1992 in response to the Lead Contamination Control Act. Drinking fountains with lead levels over 20 ppb were replaced. However, subsequent testing showed that levels at some outlets continued to be above 20 ppb. Internal recommendations to replace plumbing at four schools were not implemented because of levy failures. A flushing program was implemented, but was not consistently applied.

In 2003, a concerned parent conducted testing at one school because of iron staining problems. The testing showed that there were also lead problems at the school. Recognizing that the problem was likely widespread, the district put all schools over 7 years old on bottled water and sent a letter of notification to every parent.

A consultant was hired to create a comprehensive testing program for almost 100 schools. A working group consisting of the school's local water utility, the county and state health departments, and toxicologists was formed to develop a comprehensive approach.

A comprehensive water quality policy was adopted that includes standards for lead and 5 other contaminants. The standard for lead (10 ppb) is more stringent than EPA's recommended Action Level for schools and public buildings. The policy includes procedures for short-term and long-term testing, and for remediation.

Testing

In cooperation with the working group, the district's consultant developed plumbing profiles and a testing program, and the district began comprehensive lead testing in 2004 at 2400 sample locations. All drinking water fountains and cold taps in classrooms, nurse's offices, and kitchens were sampled. Other locations were sampled if they were deemed to be a potential health risk because of possible human consumption. Lead levels over 20 ppb were found at 25% of the locations. One location was 1600 ppb. Fifty schools were found to have at least one outlet with a problem. The water supplied by the local utility was found to have typically less than 1 ppb lead and was ruled out as a source of lead.

Testing also showed that flushing of the outlets for 30 seconds reduced the lead levels to below 20 ppb at all but 3% of the locations. Additionally, cadmium was found at 3% of the sample locations, and coliform-positive samples were found at 6 schools.

Remediation

The district adopted a policy for mitigation that included a target level of 10 ppb for lead. Additionally, the EPA public water supply standards for cadmium, copper, iron and coliform bacteria were adopted. (The EPA standard for iron is a secondary standard, which means that the standard is primarily an aesthetic standard rather than health-based. Under federal law, public water supplies are not required to comply with secondary standards.) Compliance with the district's adopted standards will be maintained through fixture replacement, filtration, replacement/rehabilitation of lines, or disabling of outlets.

Fountains and other outlets that produce lead analysis results higher than 10 ppb will be fixed or disabled. Fixtures with confirmed levels of iron over 0.5 ppm will be fixed or removed from service. If more than one-half of the drinking water sources in a school or in a wing of a school exceed 0.3 ppm iron, further remediation for iron will be addressed by the district.

The plumbing in the four schools originally targeted for replacement was fixed in the Summer of 2004. Eventually, the plumbing in 11 more schools will be replaced or rehabilitated so the adopted water quality standards can be maintained.

Bottled water is provided at all schools or locations within a school which have lead problems until problems are addressed. Drinking water is easily available to all students and all staff throughout the school day. After compliance with the adopted water quality standards is achieved, periodic testing will continue every three years until it is demonstrated that less frequent testing is necessary.

Public Education

The district understands the importance of informing parents, students, and staff of water quality policy and testing results.

Additionally, the district adopted the following steps:

- Qualified experts were retained to obtain the best advice.
- A public oversight committee was created to ensure awareness and involvement of the public.
- Community meetings are held as necessary to keep the public updated.
- School board briefing sessions related to lead are open to the public.
- A comprehensive Web site has been developed that includes health effects information, FAQs, contact information, and testing results for each school in the district.

Lessons Learned

The district had attempted to address the Lead Contamination Control Act in 1991 and 1992 through testing, replacement of drinking water fountains and flushing. Fountains that tested over 20 ppb were replaced until subsequent testing revealed that problems with lead persisted. Flushing efforts that were initially instituted were not uniformly implemented at all district schools. The district had also planned to replace plumbing in four schools, but the effort was derailed by failed levy measures. Additionally, there were no clear legal mandates for lead testing and compliance at schools served by public water utilities. Lead problems therefore continued at the schools without school officials' awareness.

Because remedial measures were not instituted as originally planned, the public was not aware that lead problems existed until 2003. The public response to the problems was very strong and clear. The public wanted to be aware of the problems and wanted them fixed. The school district had also lost credibility because of the amount of time, the inactivity, and the lack of communication since problems were initially discovered in the early 1990s.

The district has learned that clear, open, and timely communication is mandatory in order to restore public confidence. An aggressive policy of testing, remediation and disclosure has helped to bridge the gap between the district and the public and to restore confidence.

Exhibit 5.4: Case Study 2 *(Place Holder)*

Place holder for Case Study 2: Philadelphia Schools

6. Informing the Public about Lead

In addition to testing for lead and solving any contamination problems, a lead control program should also include a public information component. This section discusses public information techniques and the importance of developing an overall communication strategy. Helpful communication hints are provided along with sample public notice materials.

6.1 Techniques for Disseminating Public Information

EPA recommends that schools conducting a lead-in-drinking-water sampling program comply with the public information components of the Lead Contamination Control Act. There are two components:

(1) Make copies of the sampling results available in your administrative offices "for inspection by the public, including teachers, other school personnel, and parents."

(2) Notify relevant parent, teacher, student, and employee organizations of the availability of your sampling program results.

Given the health effects of lead, EPA advocates that any school conducting sampling for lead make public any test results. In addition, such schools should identify activities they are pursuing to correct any lead problems found.

There are six basic public notification methods that can be applied alone or in combination to communicate lead-in-drinking-water issues and the meaning of your sampling program results.

You should choose the method(s) that best suits your particular situation and/or protocol. Remember, you should not provide sampling program results to the public without also providing a basis for interpreting and understanding the significance of those results.

- **Press Release:** A press release in the local newspaper can potentially inform a broad range of the public of lead-in-drinking-water issues and the results of your sampling program. It is important that the release inform readers of how to obtain the sampling results and other lead-in-drinking-water information and perhaps even include the phone number of an informed and available facility official.

- **Letters/Fliers:** Letters or fliers represent the most direct and effective method of communicating lead-in-drinking-water activities to parents/guardians and other members of your school or building community. The letters and fliers should be mailed directly.

- **Mailbox or Paycheck Stuffers:** Mailbox and paycheck stuffers represent the most direct and effective method of communicating lead-in-drinking-water activities to school employees. Stuffers would contain much the same information as that contained in a press release or letter/flier.

- **Staff Newsletter:** A notice contained in a staff newsletter is a further option for directly and effectively communicating information about the lead program to employees.

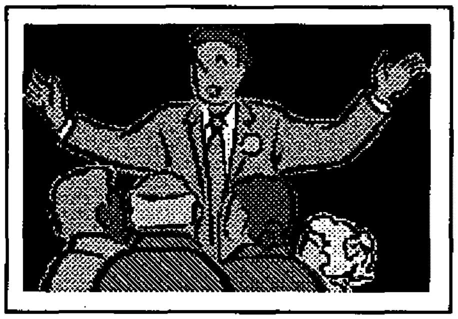
- **Presentations:** Providing presentations at facility-related meetings is another effective means of communication. Relevant events for schools include meetings of parent-teacher organizations, faculty, and the school board.

- **Email and Web sites:** Electronic communications are convenient for many parents, especially those who work during the school day. Websites can be updated frequently to quickly convey new information. Email provides a quick, easy method for parents to ask questions, but responses must be timely to be effective.

6.2 The Components of an Effective General Communication Strategy

Lead in drinking water can be an emotional and sensitive issue, especially for parents who are concerned about their children's safety. As a result, you should not view communication and outreach activities as stand-alone or final efforts, but rather as a part of an *overall or general* communication strategy.

The purpose of a general communication strategy is to provide the means for addressing questions from members of your facility's community and also to provide ongoing, up-to-date information regarding your sampling efforts. *Ideally, you should designate a single spokesperson or special task force to interact with the public since it is important that your message remain consistent.*



The issues to be addressed as part of a communication strategy include:

- Participants

- Timing for delivery

- Content of the message

- Methods and manner of communication.

6.3 Participants

Overall, there are six primary players or interests involved in the control of lead in drinking water:

(1) Building Community: The building community consists of those users of the facility who would be most affected by lead-in-drinking-water problems (i.e., students, parents, school boards, teachers, and other employees). Members of the local school community should be the primary targets of any general communication activities.

(2) Larger Community: The local and regional media can serve as a conduit for information reaching a larger local community. It is important that you be prepared to generate accurate news releases. Also, your spokesperson or task force should be prepared to respond to interview requests with accurate and consistent information.

(3) States and EPA Regions: State drinking water programs and EPA Regional offices are responsible for ensuring that public water systems comply with the State and Federal regulations regarding lead in drinking water. States or EPA may be able to provide guidance or technical assistance in communication strategies, health risks, and other sources of lead.

(4) Drinking Water Community: Public water systems comprise the regulated drinking water community, and they are responsible for complying with all national and State drinking water standards for lead. This means that they must ensure that the water they deliver is non-corrosive, contains minimal amounts of lead, and will not result in significant lead-leaching from plumbing in individual homes and buildings.

(5) Local Health Community: Local health officials, such as health officers, sanitarians and nurses, can help you understand potential health risks associated with elevated lead levels in drinking water.

(6) Your School Community: School employees, students, and parents should be informed and involved from the beginning of the process. Interested employees, students and parent volunteers can help address the issue and ensure safe drinking water at your school.

6.4 Timing

The timing of your communication activities is very important. Whenever public health risks are involved, public communication efforts are less complicated and generate less conflict if those potentially affected are notified in advance of important issues and events. At a minimum, EPA recommends that you provide information to members of the local school community and the larger community (if deemed necessary) at the following three times.

(1) Before your lead-in-drinking-water sampling program begins.

(2) In response to periodic interest.

(3) After you obtain the results of testing when/if you decide upon corrective measures, or if no corrective measure are required because the lead levels are low.

6.5 Content

Your communication messages should consist of the following information:

(1) Details about the nature of your drinking water lead control program.

(2) The results of your sampling program and your plans for correcting any identified problems.

(3) Information on the public health effects and risks posed by lead in drinking water and the significance of lead in drinking water versus other sources such as food, air, dust, and soil.

(4) The availability of general lead-in-drinking-water information resources and the availability of the detailed sampling results for your facility.

(5) How and where individuals may seek blood-lead level testing if they are concerned.

(6) Recommend consultation with a physician if further assistance is needed.

(7) How families can increase their awareness of exposure in their home and elsewhere.

6.6 Methods and Manner of Communication

The communication methods that can be used for your general communication strategy are largely the same as those described earlier and, thus, need not differ from communication activities common to school operations (i.e., meeting presentations, press releases, mailbox/paycheck stuffers, and letters to staff and parents).

Additional methods unique to your lead control program may include:

(1) Creating an information center located at a convenient place in the facility such as a library or break room.

(2) Creating a task force with representatives from the community.

(3) Making available a list of laboratories that are State-certified to test home water for lead and other contaminants.

(4) (For schools) encouraging classroom science activities that focus on drinking water quality. *(Contact EPA's Safe Drinking Water Hotline – see Appendix B – for information on organizations that have such science activities).*

The following list contains some *hints for effective communication*:

(1) Take the initiative in providing information to your community (it is important to do so before the media does it for you). When public health risks are involved, especially with respect to children, vague or incorrect information can be worse than no information at all.

(2) Be a good and reliable source of information. That is, provide honest, accurate, and comprehensive information in every necessary area.

(3) Always speak with one voice (i.e., designate points of contact – preferably one person – to respond to parents and the media).

(4) Anticipate likely questions from members of the local community, including civic organizations and the media and prepare answers. Each member of the community may have a different concern or viewpoint on the subject of lead testing.

(5) Be positive, proactive, and forthcoming when working with the media. If you work together in a cordial manner, your communication efforts are likely to be less complex.

(6) Keep members of the building community up-to-date as important events and information on your lead testing program unfold.

(7) Be sure to have communication materials available in languages other than English or provide a contact name and number for non-English speakers to get information if your local community has a large portion of non-English speaking residents.

6.7 Sample Public Notice Materials

Exhibit 6.1 contains a sample public notification letter that could be used and adapted to communicate lead testing information. Exhibit 6.2 is a sample press release for local media that could also be used or adapted. Exhibit 6.3 is a sample article that could be published in a school newsletter.

Exhibit 6.1: Sample Public Notice Letter

(Date)

Anytown School Department
Anytown, USA 00000-0000

Dear Members of the Anytown School Community:

The United States Environmental Protection Agency (EPA) has determined that lead at certain levels in drinking water may be a a health concern. Infants and young children are the most vulnerable to the effects of lead. Pregnant women are also vulnerable to lead because it can lower birth weight and slow down normal physical and mental development of the baby. Lead in young children, especially those under the age of six, can result in lower IQ levels, impaired hearing, reduced attention span, and poor classroom performance. At high levels, lead can seriously damage the brain.

However, since lead usually enters water from certain plumbing in individual homes and businesses, EPA advises testing of water in private buildings. EPA recommends that action be taken if lead levels exceed 20 parts per billion (ppb) at any tap tested.

Following instructions given in an EPA guidance document designed for schools, we completed an evaluation of the plumbing in each of the buildings within the Anytown School District. Through this effort, we identified and tested those drinking water taps most likely to have high levels of lead. Of the _____ samples taken, all but _____ tested well below EPA's recommended level of 20 ppb for lead.

The first tap that tested high for lead was a drinking water fountain at Kennedy High School. After follow-up testing was conducted, it was determined that the faucet was the source of the lead contamination. The faucet was replaced with a lead-free faucet and retested. Follow-up test results revealed lead levels well below EPA's recommended level.

The second tap, located in the Lincoln Elementary School, was a faucet in the kitchen that showed unacceptable lead levels in both initial and follow-up testing. We found the source of the lead contamination to be the pipe providing water to the faucet. This pipe was replaced with lead-free materials.

During the sampling period, bottled water was provided to all students at all schools to minimize the potential for lead exposure. Upon receiving the test results, the two outlets that tested high for lead were disconnected until they were replaced.

A copy of the test results is available in our central office for viewing by the public, including students, teachers, other school personnel, and parents and can be viewed between the hours of [_:_a.m. and _:_p.m] [and on our school website]. For more information about drinking water quality in our schools, contact John Doe at the Anytown School Department, 555-2223. For information about drinking water quality in your home or for questions about testing, contact your water supplier or state drinking water agency.

Sincerely,

Fred Frank
Superintendent of Schools

NOTE: If permanent remediation measures cannot be implemented immediately, you are encouraged to send this notice without delay. In that case, you can describe the interim measures that are in place, and explain the reason for the delay in permanent remediation.

Exhibit 6.2: Sample Press Release for Local Media

Anytown School Department
One School Street
Anytown, USA 00000-0000
Contact: Fred Frank, Superintendent

FOR IMMEDIATE RELEASE

News Release

Lead Levels in School Drinking Water Meet Federal Guidelines

Anytown, USA, April xx, 2005... The Anytown School Department announced today that recent tests of drinking water in the town's schools indicate that lead levels meet Federal guidelines. Although lead was initially detected above the recommended level at one drinking water outlet in an elementary school and at one outlet in a senior high school, lead levels were reduced to acceptable levels following replacement of these outlets.

In making the announcement, School Superintendent Fred Frank stated, "We are pleased that the testing program identified only two drinking water outlets with elevated lead levels. Both outlets have since been replaced."

The School Department conducted the testing program to make sure that drinking water in the school system is safe for children and school staff. Water with high lead levels can contribute to negative health effects, especially in young children.

The testing was conducted in January by school personnel following Federal and State guidelines. Samples from various locations in each of the schools were sent to a State-certified laboratory for analysis. The laboratory results were received by the School Department last week.

Information about the lead testing program, including the laboratory results, can be found at the School Department office at the above address, weekdays between 8:30 a.m. and 4:30 p.m.

STOP

Exhibit 6.3: Sample Newsletter Article

Anytown School District Conducts Sampling for Lead in Drinking Water

Why was Sampling Conducted?

Schools that receive water from a public water system, such as our district, are not required by state or federal regulations to conduct sampling for lead in their drinking water. The Environmental Protection Agency (EPA) requires our public water system to provide water to our school that is minimally corrosive. However, some school districts in other locations have found that water samples from their drinking water fixtures have contained relatively high levels of lead. The lead was found to come from the plumbing inside the schools, including fittings, solder, water coolers or water faucets. Because of this information, the Anytown School District decided that sampling would be in the best interests of the children, parents, faculty and other citizens served by our district.

Health Effects of Lead

The EPA has determined that lead in drinking water is a health concern at certain levels of exposure. Lead is found throughout the environment in lead-based paint, air, soil, household dust, food, certain types of pottery porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination - like dirt and dust - that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

How Lead Enters our Water

Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like groundwater, rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and in building plumbing. These materials include lead-based solder used to join copper pipe, brass and chrome-plated brass faucets. In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials. However, even the lead in plumbing materials meeting these new requirements is subject to corrosion. When water stands in lead pipes or plumbing systems containing lead for

(Continued on next page)

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several hours or more, the lead may dissolve into the drinking water. This means the first water drawn from the tap in the morning *may* contain fairly high levels of lead.

Lead in Drinking Water

Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of children under the age of 6. EPA estimates that drinking water can make up 20% or more of a person's total exposure to lead.

Results of our Sampling

Following instructions given in an EPA guidance document especially designed for schools, we completed a plumbing profile for each of the buildings within the Anytown School District. Through this effort, we identified and tested those drinking water outlets most likely to have high levels of lead. Of the _____ samples taken, all but _____ tested well below EPA's recommended level of 20 ppb for lead.

The first outlet that tested high for lead was a drinking water fountain (bubbler) at Kennedy High School. After follow-up testing was conducted, it was determined that the faucet (bubbler head) was the source of the lead contamination. The faucet was replaced with a lead-free faucet and retested. Follow-up test results revealed lead levels well below EPA's recommended level.

The second outlet, in the Lincoln Elementary School, was a faucet in the kitchen that showed unacceptable lead levels in both initial and follow-up testing. We found the source of the lead contamination to be the pipe providing water to the faucet. This pipe was replaced with lead-free materials.

During the sampling period, bottled water was provided to all students at all schools to minimize the potential for lead exposure. Upon receiving the test results, the two outlets that tested high for lead were disconnected until they were replaced.

A copy of the test results is available in our central office for inspection by the public, including students, teachers, other school personnel, and parents and can be viewed between the hours of 8:30 a.m. and 4:00 p.m. For more information about water quality in our schools, contact John Doe at the Anytown School Department, 555-2223. For information about water quality in your home or for questions about testing, contact your water supplier or drinking water agency.

Appendix A – Glossary of Terms

Bubbler: An outlet fixture that consists of the bubbler valve, the bubbler receptacle and all associated piping, valves and mounting appurtenances for attaching the fixture to a wall or mounting surface. A bubbler does not contain a refrigeration unit. Some bubblers are attached to central chiller units, while others are not.

Bubbler Valve: The valve and discharge device that mounts on top of the bubbler fixture and discharges water for consumption.

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

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

Drinking Water Fountain: A fixture connected to the water supply that provides water as needed. There are four types of drinking water fountains: (1) bubblers without central chillers, (2) bubblers with central chillers, (3) water coolers, and (4) bottled water dispensers.

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

Fittings and Valves: Any of numerous mechanical devices by which the flow of water may be started, stopped, or regulated by a movable part that opens, shuts, or partially obstructs one or more ports of passageway.

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

Header: The main pipe in the internal plumbing system of a building. The header supplies water to lateral pipes.

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

Lead-free: Taken from Section 1417(d) of the Safe Drinking Water Act, this term means that solders and flux may not contain more than 0.2 percent lead; pipes, pipe fittings, and well pumps may not contain more than 8.0 percent lead; and outlet plumbing fitting and fixtures must meet standards established under the lead leaching requirements of section 1417(e) of the Safe Drinking Water Act.

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

Potable Water Pipes: The pipes in a distribution system and in a building which carry water intended for human consumption.

Public Water System: Any water system that has 15 or more service connections and is in operation at least 60 days per year or any water system serving 25 or more persons daily at least 60 days per year.

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

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

Service Connection: The pipe that carries tap water from the public water main to a building. In the past, these were often comprised of lead materials.

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

Solder: A metallic compound used to seal the joints between pipes. Until 1988, solder containing up to 50% lead was legally used in potable water plumbing. "Lead-free" solders, which can contain up to .2% lead, often contain one or more of the following metals: antimony, tin, copper or silver. Several alloys are available that melt and flow in a manner similar to lead solder.

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

Appendix B – Publication List

Web Site Publications*

(1) ***Actions You Can Take To Reduce Lead in Drinking Water.** Web site publication. US EPA 810-F-93-001. June 1993. http://www.epa.gov/safewater/lead/leadfactsheet.html

(2) **Commonly Asked Questions: Section 1417 of the Safe Drinking Water Act and the NSF Standard.** US EPA. http://www.epa.gov/safewater/standard/plumbing.html

(3) **Consumer Fact Sheet on: Lead.** Web site article. US EPA. http://www.epa.gov/safewater/dwh/c-ioc/lead.html

(4) **Decision Tree for Pre-Sampling** (at Schools). Web site article. US EPA. http://www.epa.gov/safewater/lead/safedecisiontree.htm

(5) ***Fact Sheet - Lead Reduction Plan - EPA Activities to Improve Implementation of the Lead and Copper Rule.** Web site publication. US EPA 810-F-05-001. March 2005. http://www.epa.gov/safewater/lcrmr/reductionplan_fs.html

(6) **Frequently Asked Questions.** Web site article. National Sanitation Foundation (NSF). http://www.nsf.org/business/water_distribution/dwa_usepa.asp

(7) ***Is There Lead in the Drinking Water?** Web site publication. US EPA 903-F-01-002. April 2002. http://www.epa.gov/safewater/lead/pdfs/v2final.pdf

(8) ***Lead Contamination Control Act** (pamphlet). Web site article. Web site publication. US EPA 570/9-89-AAA. July 1989. http://www.epa.gov/safewater/lead/pdfs/epalccapamphlet1989.pdf

(9) **Lead Contamination Control Act** (statute). Web site article. Government Printing Office. January 2004. http://www.access.gpo.gov/uscode/title42/chapter6a_subchapterxii_partf_.html

(10) ***Lead in Drinking Water in Schools and Non-Residential Buildings.** Web site publication. US EPA 812-B-94-002. (April 1994 version of this document.) http://www.epa.gov/safewater/consumer/leadinschools.html

(11) **Lead in Schools and Day Care Centers.** Web site article. US EPA.) http://www.epa.gov/safewater/lead/schoolanddccs.htm

(12) **Mechanical Plumbing System Components.** Web site article. Listing of approved components. NSF.

http://www.nsf.org/business/mechanical_plumbing/index.asp?program=MechanicalPluSysCom

(13) *National Lead Information Center - Document Request Site.* US EPA. http://www.epa.gov/lead/nlicdocs.htm

(14) ***Post-Remediation Sampling***. Web site article.(after replacement of fixtures, pipe, fittings, etc.). US EPA. http://www.epa.gov/safewater/lead/passivation.htm

(15) ***Testing Schools and Day Care Centers for Lead in Drinking Water.*** Web site article. US EPA. http://www.epa.gov/safewater/lead/testing.htm

(16) ***Lead Contamination Control Act** (P.L. 100-572 - Federal statute) and supporting documents. House Document Room, House of Representatives. Washington, DC 20515. (202) 225-3456.

(17) ****Sampling for Lead in Drinking Water in Nursery Schools and Day Care Facilities*** (booklet). US EPA 812-B-94-003. April 1994.

(18) ****The Lead Ban: Preventing the Use of Lead in Public Water Systems and Plumbing Used for Drinking Water*** (pamphlet on the Federal lead ban). US EPA 570/9-89-BBB. August 1989.

* Also available in hard copy through the National Drinking Water Hotline. See below.

Hard Copy Publications

EPA National Safe Drinking Water Hotline
(800) 426-4791

Hotline operates Monday through Friday, 9:00 am to 5:30 pm (EST), except Federal holidays.

Appendix C – List of State Drinking Water Programs

Alabama
Mr. Ed Hughes, Chief
Drinking Water Branch
Dept. of Environmental Management
P.O. Box 301463
Montgomery, AL 36130-1463
Phone: 334-271-7774
Fax: 334-279-3051
E-mail: ekh@adem.state.al.us

Alaska
Dr. James Weise, Manager
Drinking Water Program
Division of Environmental Health
Alaska Dept. of Environmental Conservation
555 Cordova St.
Anchorage, AK 99501
Phone: 907-269-7647
Fax: 907-269-7655
E-mail: james_weise@dec.state.ak.us

American Samoa
Ms. Sheila Wiegman, Environmental Coordinator
American Samoa
Environmental Protection Agency
Office of the Governor
Pago Pago, AS 96799
Phone: 684-633-2304
Fax: 684-633-5801

Arizona
Mr. John Calkins
Drinking Water Section
Arizona Dept. of Environmental Quality
1110 W. Washington St.
Phoenix, AZ 85007
Phone: 602-771-4617
Fax: 602-771-4634
E-mail: calkins.john@azdeq.gov

Arkansas
Mr. Harold R. Seifert, P.E., Director
Division of Engineering
Arkansas Department of Health
4815 West Markham Street
Mail Slot 37
Little Rock, AR 72205-3867
Phone: 501-661-2623
Fax: 501-661-2032
E-mail: hseifert@HealthyArkansas.com

California
Dr. David P. Spath, Chief
Division of Drinking Water and Environmental Management
California Dept. of Health Services
P.O. Box 997413
Sacramento, CA 95899-7413
Phone: 916-449-5582
Fax: 916-449-5575
E-mail: DSpath@dhs.ca.gov

Colorado
Mr. Chet Pauls, Manager
Drinking Water Program
Water Quality Control Division
Colorado Dept. of Public Health and Environment
WQCD-DW-B2
4300 Cherry Creek Drive, South
Denver, CO 80246-1530
Phone: 303-692-3610
Fax: 303-782-0390
E-mail: chester.pauls@state.co.us

Connecticut
Dr. Gerald R. Iwan, Director
Drinking Water Division
Connecticut Dept. of Public Health
410 Capitol Ave. MS-51WAT
P.O. Box 340308
Hartford, CT 06134-0308
Phone: 860-509-7333
Fax: 860-509-7359
E-mail: gerald.iwan@po.state.ct.us

Delaware

Mr. Edward G. Hallock, Program Administrator
Office of Drinking Water
Division of Public Health
Delaware Health and Social Services
Blue Hen Corporate Center, Suite 203
655 Bay Road
Dover, DE 19901
Phone: 302-741-8590
Fax: 302-741-8631
E-mail: edward.hallock@state.de.us

District of Columbia
Ms. Jerusalem Bekele, Chief
Water Quality Division
Department of Health
51 N Street, NE
Washington, DC 20002
Phone: 202-535-1603
E-mail: jerusalem.bekele@dc.gov

Florida
Mr. Van R. Hoofnagle, Administrator
Drinking Water Section
Florida Dept. of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
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Appendix D – Water Cooler Summary

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

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

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

Based on responses to a Congressional survey in the winter of 1988, three major manufacturers, the Halsey Taylor Company, EBCO Manufacturing Corporation, and Sunroc Corporation, indicated that lead solder had been used in at least some models of their drinking water coolers. On April 10, 1988, EPA proposed in the *Federal Register* (at 54 *FR* 14320) lists of drinking water coolers with lead-lined tanks and coolers that are not lead-free. Public comments were received on the notice, and the list was revised and published on January 18, 1990 (Part III, 55 *FR* 1772). *See Table D-2 for a list of water coolers and lead components.*

Prior to publication of the January 1990 list, EPA determined that Halsey Taylor was the only manufacturer of water coolers with lead-lined tanks.[1] Table D-1 presents a listing of model numbers of the Halsey Taylor drinking water coolers with lead-lined tanks that had been identified by EPA as of January 18, 1990..

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

Since the LCCA required the CPSC to order manufacturers of coolers with lead-lined tanks to repair, replace or recall and provide a refund of such coolers, the CPSC negotiated such an agreement with Halsey Taylor through a consent order published on June 1, 1990 (at 55 *FR* 22387). The consent agreement calls on Halsey Taylor to provide a replacement or refund program that addresses all the water coolers listed in Table D-2 as well as "all tank-type models of drinking water coolers manufactured by Halsey Taylor, whether or not those models are included on the present or on a future EPA list." Under the consent order, Halsey Taylor agreed to notify the public of the replacement and refund program for all tank type models.

SPECIAL NOTE:

Experience indicates that newly installed brass plumbing components containing 8 percent or less lead, as allowed by the SDWA, can contribute high lead levels to drinking water for a considerable period after installation. U.S. water cooler manufacturers have notified EPA that since September 1993, the components of water coolers that come in contact with drinking water have been made with non-lead alloy materials. These materials include stainless steel for fittings and water control devices, brass made of 60 percent copper and 40 percent zinc, terillium copper, and food grade plastic.

Currently, a company formerly associated with Halsey Taylor, Scotsman Ice Systems, has assumed responsibility for replacement of lead-line coolers previously marketed by Halsey Taylor. See below for the address of Scotsman Ice Systems.

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Table D-1
Halsey Taylor Water Coolers With Lead-Lined Tanks[2]

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

WM8A	WT8A	GC10ACR	GC10A	GC5A	RWM13A

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

WM14A Serial No. 843034	WM14A Serial No. 843006	WT11A Serial No. 222650
WT21A Serial No. 64309550	WT21A Serial No. 64309542	LL14A Serial No. 64346908

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

Table D-2
Water Coolers With Other Lead Components

EBCO Manufacturing

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

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

CP3	DP15W	DPM8	7P	13P	DPM8H	DP15M	DP3R	DP8A
DP16M	DP5S	C10E	PX-10	DP7S	DP13SM	DP7M	DP7MH	DP7WD
WTC10	DP13M-60	DP14M	CP10-50	CP5	CP5M	DP15MW	DP3R	DP14S
DP20-50	DP7SM	DP10X	DP13A	DP13A-50	EP10F	DP5M	DP10F	CP3H
CP3-50	DP13M	DP3RH	DP5F	CP3M	EP5F	13PL	DP8AH	DP13S
CP10	DP20	DP12N	DP7WM	DP14A-50/60				

Halsey Taylor

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

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

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

HC8WT	HC14F	HC6W	HWC7D	HC8WTH	HC14FH	HC8W	HC2F	HC14WT
HC14FL	HC14W	HC2FH	HC14WTH	HC8FL	HC4F	HC5F	HC14WL	HCBF7D
HC4FH	HC10F	HC16WT	HCBF7HO	HC8F	HC8FH	HC4W	HWC7	

If you have one of the Halsey Taylor water coolers noted in Table D-2, contact Scotsman Ice Systems *(address and phone noted above)* to learn more about the requirements surrounding their replacement and rebate program.

Appendix E – Sample Recordkeeping Form

Record of Sampling

Name of Building	
Name of Sample Collector	
Contact Person for this Record	

				Sample ID Number

Circle sample type: Initial / 1st Follow-up / 2nd Follow-up

Length of Flush (for flushed samples)	
Type of Outlet (faucet, cooler etc.)	
Mfg/Model	
Serial #	
Date of Installation	
Location	
Date of Collection	
Time of Collection	
Name of Laboratory Used	
Lead Concentration (ppb)	

NOTES:

Appendix F – Preservation of Samples and Sample Containers

This appendix contains information pertaining to the preservation of samples and sample containers. A certified drinking water laboratory should be aware of these requirements. In addition, they will provide you with actual samplers or sample containers and instructions. The sample containers may have been prepared prior to your receipt. The laboratory will also specify how to handle the sample containers and when to submit them after taking your samples.

In order to avoid analytical errors, pay particular attention to proper collection and handling of the sample before analysis. Sample containers (250 mL) should be obtained from a certified laboratory. You should not use other containers such as used jars or water bottles.

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

For more detailed information, refer to the following documents:

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

Manual for the Certification of Laboratories Analyzing Drinking Water. US EPA 815-B-97-001. March 1997 (available from the National Technical Information Service (703) 487-4650).

Standard Methods for the Examination of Water and Wastewater, 20th Edition. Co-published by the American Public Health Association, the Water Environment Federation, and the American Water Works Association. 1998 (available from the American Water Works Association, ISBN # 0-87553-235-7, Catalog #10079

Appendix G – Example Scenarios for Water Sample Results

Service Connection Sampling (See Exhibit 4.3)

Examples:

- Sample 1S (20 ppb) exceeds Sample 1M (5 ppb) = 15 ppb of lead is contributed from the service connection; the lead amount in the main (Sample 1M) does not exceed 5 ppb; therefore, you may want to check for a lead service connection or gooseneck depending upon results of lead testing at other outlets in the building; if you reduce lead at the connection, lead levels may be reduced throughout the remainder of the building.
- Sample 1M is 10 ppb and Sample 1S is 10 ppb = very little lead is contributed from the service line; source of lead is most likely the water main.
- Sample 1S (7 ppb) and Sample 1M (6 ppb) are close to 5 ppb = very little lead (1 ppb) is being picked up in the water from the service line or the distribution main; very little lead is contributed from the source water; if other outlets show significantly higher lead levels, the source of the contamination is the interior plumbing and/or the outlets themselves.

Drinking Water Fountain without Central Chiller (See Exhibit 4.4)

Example:

- Sample 1A (31 ppb) exceeds Sample 2A (7 ppb) = 24 ppb of lead is contributed from the bubbler.
- Sample 2A (7 ppb) does not significantly exceed 5 ppb = very little lead (2 ppb) is being picked up from the plumbing upstream from the bubbler; the majority of the lead in the water is contributed from the bubbler.
- Sample 2A (7 ppb) does not exceed 20 ppb = sampling from header or loop supplying water to the lateral is not necessary.

Possible Solution: Replace fixture, valves, or fittings on bubbler with lead-free device (request results of lead leaching tests from distributors or manufacturers of any fixtures you intend to purchase); retest water for lead after new materials installed.

Drinking Water Fountain with Central Chiller (See Exhibits 4.4 and 4.9)

Example 1:

- Sample 1B (25 ppb) exceeds Sample 2B (3 ppb) = 22 ppb of lead is contributed from the bubbler.
- Sample 2B (3 ppb) is close to 5 ppb = very little lead (2 ppb) is being picked up from the plumbing upstream from the bubbler; the majority or all of the lead is contributed from the bubbler.

Possible Solution: Replace bubbler valve, fittings and/or fixture with lead-free materials (request results of lead leaching studies from manufacturers of brass products before purchasing to ensure that harmful amounts of lead will not be leached); retest water once new materials installed.

Example 2:

- Sample 1B (38 ppb) exceeds Sample 2B (21 ppb) = 17 ppb of lead is contributed from the bubbler.
- Sample 2B (21 ppb) significantly exceeds 5 ppb = about 21 ppb of lead is being contributed from the plumbing upstream from the bubbler.
- Sample 2B (21 ppb) exceeds 20 ppb = sampling from the chiller unit supplying the water to the lateral is necessary to locate the source of the contamination *(see instructions and examples below for sampling chiller units).*

Example 3:

- Sample 2B (21 ppb) exceeds Sample 2K (10 ppb) = 11 ppb of lead is contributed from the plumbing supplying the water from the chiller to the bubbler.
- Sample 2K (10 ppb) exceeds Sample 1K (4 ppb) = a portion of the lead (6 ppb) may be coming from the chiller; check for and remove any debris and sludge in the chiller unit; flush the unit, and resample the water.
- Sample 1K (4 ppb) does not exceed 20 ppb = additional sampling from the distribution system supplying water to the chiller is not necessary.
- Sample 1K (4 ppb) is very close to 5 ppb = very little lead is picked up from the plumbing upstream from the chiller; the majority or all of the lead in the water can be attributed to the chiller and the plumbing downstream from the chiller.

Possible Solutions: Flush the chiller unit and plumbing; if lead levels are still high, replace plumbing supplying water from the chiller to the bubbler; replace the bubbler fixture, fittings, and valves with lead-free materials; and clean sediment and debris from chiller unit. Retest water for lead once changes have been made. If the lead levels after initial flushing are low, clean any sediment and debris from the chiller, and resample the chiller monthly for 3 months. If the lead levels increase, the additional remediation measures listed immediately above are probably necessary to reduce lead risks. If the levels remain low, routine annual cleaning of sediment and debris and routine monitoring at the same frequency as other sites is recommended .

Drinking Water Fountain with Central Chiller (cont.)

Example 4:

- Sample 2B (45 ppb) exceeds Sample 2K (28 ppb) = 17 ppb of lead is being contributed from the plumbing supplying water from the chiller to the bubbler.
- Sample 2K (28 ppb) exceeds Sample 1K (21 ppb) = 7 ppb of lead is contributed by the chiller.
- Sample 1K (21 ppb) exceeds 20 ppb = additional sampling from the distribution system supplying water to the chiller is necessary to locate the source of the contamination *(see Exhibit 4.9 on Sampling Interior Plumbing for instructions).*

Possible Solution: Lead levels are clearly elevated at all sample sites. It appears that multiple sources of lead are contributing to the problem. Retesting may help locate sources of lead, but it appears that the solution includes replacement of upstream plumbing; the bubbler fixture, valves, and fittings with lead-free materials; and, cleaning the sediment and debris from the chiller. Retest water for lead after changes have been made. If levels are still elevated, replacement of the chiller may be necessary.

Drinking Water Fountain with Self-Contained Chiller (Water Coolers) (See Exhibit 4.5)

Example 1:

- Sample 1C (54 ppb) = the plumbing upstream from the cooler and/or the water cooler is contributing lead.
- Sample 3C (40 ppb) exceeds Sample 2C (5 ppb) = the water cooler is contributing 35 ppb of lead.
- Sample 3C (40 ppb) exceeds Sample 2C (5 ppb) and Sample 1C (54 ppb) exceeds Sample 3C (40 ppb) = the plumbing directly upstream from the cooler is contributing 14 ppb of lead.
- Sample 2C (5 ppb) is less than 10 ppb and Sample 2C is less than Sample 1C (54 ppb) and Sample 3C (40 ppb) = the source of lead is not sediments contained in the cooler storage tank, screens, or plumbing upstream from the cooler.

Possible Solutions: Replace the cooler with one that contains lead-free components, and retest the water or find an alternative lead-free drinking water source; locate source of lead from plumbing and eliminate it *(routine flushing is not applicable as a potential remedy for water coolers – see discussion of this issue in Sections 5.2 and 5.3 of this guidance document for further*

Drinking Water Fountain with Self-Contained Chiller (Water Coolers - cont.)

Example 2:

- Samples 1C (44 ppb), 3C (42 ppb) and 2C (41 ppb) are approximately equal = the cooler is not the likely source of lead.
- Sample 1C (44 ppb) exceeds Sample 3C (42 ppb) and Sample 3C and Sample 2C (41 ppb) are close = the plumbing upstream from the cooler is contributing lead to the water.
- Samples 1C (44 ppb), 3C (42 ppb) and 2C (41 ppb) are approximately equal = the source of lead is not likely sediments contained in the cooler storage tank or screens.
- Sample 4C (43 ppb) significantly exceeds 5 ppb = the source of lead is the plumbing upstream from the cooler.

Possible Solutions: Replace the plumbing upstream between the header and cooler with lead-free materials and retest the water. If the water continues to test high, the header, service connection and/or public water supply may be the problem. An evaluation should be made as soon as possible to determine the source of the lead, and other outlets should be tested immediately if not already done. Remember that flushing is not recommended as a practical remedy for water coolers.

Bottled Water Dispensers (See Exhibit 4.6)

Example 1:

- Sample 1D (23 ppb) exceeds Sample 2D (5 ppb) = 18 ppb of lead is contributed from the dispenser unit.

Possible Solution: Replace dispenser unit with one that is made of lead-free materials and retest.

Example 2:

- Sample 1D (24 ppb) and Sample 2D (23 ppb) are close = the source of lead is the bottled water.

Possible Solutions: Purchase another type of bottled water for which the distributor provides written assurance that lead levels do not exceed Federal and State lead standards, or find other alternative lead-free water source. Retest after any remedy has been employed.

Ice Making Machines (See Exhibit 4.7)

Example 1:

- Sample 1E is 22 ppb and Sample 2E (6 ppb) is close to 5 ppb = source of the lead (16 ppb) is the ice maker.

Possible Solutions: Replace plumbing components in ice maker with lead-free materials; clean debris from plumbing and screen at inlet to ice maker; replace with lead-free ice maker; retest after any remedy has been employed.

Example 2:

- Sample 1E = 22 ppb and Sample 2E (21 ppb) significantly exceeds 5 ppb = lead is contributed from the plumbing upstream from the ice maker.

- Sample 2E (21 ppb) exceeds 20 ppb = sampling from the distribution system supplying water to the ice maker is recommended *(see Exhibit 4.9 for instructions).*

Faucets (Taps) (See Exhibit 4.8)

Example 1:

- Sample 1F (39 ppb) exceeds Sample 2F (6 ppb) = 33 ppb of lead is contributed from the water faucet.
- Sample 2F (6 ppb) is close to 5 ppb = very little lead is coming from the plumbing upstream from the faucet; the majority of the lead is coming from the faucet and/or the plumbing connecting the faucet to the lateral.

Possible Solutions: Replace faucet with lead-free device (request copies of lead leaching studies from manufacturers of brass faucets and fixtures before purchasing); replace plumbing connecting the faucet to the lateral with lead-free materials; flush outlet and connecting plumbing each day; apply point-of-use device designed to remove lead; find alternative water source such as bottled water or other lead-free location in the building; retest after any remedies are employed.

Example 2:

- Sample 1F (49 ppb) exceeds Sample 2F (25 ppb) = source of lead (24 ppb) is the water faucet and the plumbing upstream from the outlet (25 ppb).
- Sample 2F (25 ppb) significantly exceeds 5 ppb = lead may be contributed from upstream from the faucet; evaluate lead test results conducted upstream from the faucet to ascertain potential contributions of lead from the upstream piping. To pinpoint location test interior plumbing *(see instructions for sampling interior plumbing in Exhibit 4.9).*

Possible Solutions: Replace faucet with lead-free device (request copies of lead leaching studies from manufacturers of brass faucets and fixtures before purchasing); replace plumbing connecting faucet to the lateral with lead-free materials; replace suspected portion of interior plumbing with lead-free materials; flush the outlet and interior plumbing each day; apply point-of-use device designed to remove lead; find alternative water source such as bottled water or water from other lead-free location in the building; retest after any remedies are employed.

Interior Plumbing (See Exhibit 4.9)

Example :

- Sample 1G (22 ppb) exceeds 20 ppb = collect additional samples from the plumbing upstream to further pinpoint the source of lead (i.e., from the service line, the riser pipe, the loop, or the header supplying water to the lateral).
- Sample 1G (22 ppb) significantly exceeds 5 ppb and is less than downstream site (35 ppb) = a portion of the lead (13 ppb) is contributed downstream from the sample site.
- Sample 1G (22 ppb) is not similar to downstream site (35 ppb) but both exceed 20 ppb = lead is contributed from the lateral or from interior plumbing upstream from the lateral; possible sources of lead may be the loop, header, riser pipe, or service connection; further sampling is necessary.

Possible Solution: Following the collection of additional samples from plumbing upstream to pinpoint sources of lead, replace plumbing with lead-free materials; retest water for lead.

Example:

- Sample 1H or 1I (23 ppb) exceeds 20 ppb = collect additional samples from the plumbing upstream supplying water to the loop or header; compare the results with those taken from the service line or the riser pipe that supplies water to the loop and/or header.
- Sample 1H or 1I (23 ppb) significantly exceeds 5 ppb and Sample 1H or 1I is less than downstream site (25 ppb) = a small portion of the lead (2 ppb) is contributed downstream of the sample site.

Possible Solution: Following the collection of additional samples upstream from the header or loop to pinpoint source of lead, replace affected plumbing with lead-free materials; retest water for lead.

Example:

- Downstream Site is 25 ppb, Service Connection Sample is 4 ppb, and Sample 1J (6 ppb) is less than 20 ppb = additional samples from upstream need not be collected; 21 ppb of lead is contributed from the downstream site.
- Sample 1J (6 ppb) is not equal to downstream site (25 ppb) = source of lead is not the riser pipe or the plumbing and service connection upstream from the riser pipe.
- 1J (6 ppb) is close to 5 ppb = the portion of the riser pipe and plumbing upstream from Sample Site 1J and the service connection are not contributing lead to the water; the source of lead is downstream of the sample site.

Possible Solution: Following the collection of samples from interior plumbing downstream from the riser pipe and the affected outlet to pinpoint the source of lead, replace affected plumbing with lead-free materials; retest water for lead.

Appendix H – 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 "Getting the Lead Out - A Guide to Reducing Lead in Drinking Water in Schools" EPA 816-D-05-001.

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.	
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? What type of solder has been used?	
3. When were the most recent plumbing repairs made (note locations)?	
4. With what materials is the service connection (the pipe that carries water to the school from the utility's main in the street) made?	

5. Specifically, what are the potable water pipes made of in your facility (note the locations)? • Lead • Plastic • Galvanized Metal • Cast Iron • Copper • Other	
6. Was lead solder used in your plumbing system? Note the locations with lead solder.	
7. 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.	
8. How many of the following outlets provide water for consumption? Note the locations. • Water Coolers • Bubblers • Ice Makers • Kitchen Taps • Drinking Fountains or Taps	

9. Has your school checked the brands and models of water coolers and compared them to the listing of banned water coolers in Appendix D? Note the locations of any banned coolers.	
10. 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.	
11. Have these screens been cleaned? Note the locations.	

12. Can you detect signs of corrosion, such as frequent leaks, rust-colored water, or stained dishes or laundry? Note the locations.	
13. Is any electrical equipment grounded to water pipes? Note the locations.	

14. Have there been any complaints about bad (metallic) taste? Note the locations.	
15. 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?	
16. 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?	

ATTACHMENT

9

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 2 9 2016

OFFICE OF
WATER

MEMORANDUM

SUBJECT: Clarification of Recommended Tap Sampling Procedures for Purposes of the Lead and Copper Rule

FROM: Peter C. Grevatt, Director
Office of Ground Water & Drinking Water

TO: Water Division Directors
Regions I - X

The Lead and Copper Rule, 40 C.F.R. Sections 141.80 to 141.91, requires monitoring at consumer taps to identify levels of lead in drinking water that may result from corrosion of lead-bearing components in a public water system's distribution system or in household plumbing. These samples help assess the need for, or the effectiveness of, corrosion control treatment. The purpose of this memorandum is to provide recommendations on how public water systems should address the removal and cleaning of aerators, pre-stagnation flushing, and bottle configuration for the purpose of Lead and Copper Rule sampling.

Removal and Cleaning of Aerators

EPA issued a memorandum on *Management of Aerators during Collection of Tap Samples to Comply with the Lead and Copper Rule* on October 20, 2006. This memorandum stated that EPA recommends that homeowners regularly clean their aerators to remove particulate matter as a general practice, but states that public water systems should not recommend the removal or cleaning of aerators prior to or during the collection of tap samples gathered for purposes of the Lead and Copper Rule. EPA continues to recommend this approach. The removal or cleaning of aerators during collection of tap samples could mask the added contribution of lead at the tap, which may potentially lead to the public water system not taking additional actions needed to reduce exposure to lead in drinking water. EPA's recommendation about the removal and cleaning of aerators during sample collection applies only to monitoring for lead and copper conducted pursuant to 40 C.F.R. 141.86.

Pre-Stagnation Flushing

EPA is aware that some sampling instructions provided to residents include recommendations to flush the tap for a specified period of time prior to starting the minimum 6-hour stagnation time required for samples collected under the Lead and Copper Rule. This practice is called pre-stagnation flushing. Pre-stagnation flushing may potentially lower the lead levels as compared to when it is not practiced.

Flushing removes water that may have been in contact with the lead service line for extended periods, which is when lead typically leaches into drinking water. Therefore, EPA recommends that sampling instructions not contain a pre-stagnation flushing step.

Bottle Configuration

EPA recommends that wide-mouth bottles be used to collect Lead and Copper compliance samples. It has become apparent that wide-mouth bottles offer advantages over narrow-necked bottles because wide-mouth bottles allow for a higher flow rate during sample collection which is more representative of the flow that a consumer may use to fill up a glass of water. In addition, a higher flow rate can result in greater release of particulate and colloidal lead and therefore is more conservative in terms of identifying lead concentrations.

Conclusion

EPA is providing these recommendations for collection of Lead and Copper Rule tap samples to better reflect the state of knowledge about the fate and transport of lead in distribution systems. The three areas discussed above may potentially lead to samples that erroneously reflect lower levels of lead concentrations. The recommendations in this memorandum are also consistent with the recommendations provided by the EPA's Flint Task Force. For more information about the Task Force please view EPA's website at: http://www.epa.gov/flint.

To provide further information on this topic, EPA included an amended "Suggested Directions for Homeowner Tap Sample Collection Procedures" in Appendix D of the 2010 revision of *Lead and Copper Rule Monitoring and Reporting Guidance for Public Water Systems* (EPA 816-R-10-004). This document can be found at:
http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100DP2P.txt

Please share these recommendations with your state drinking water program directors. If you have any questions, please contact Anita Thompkins at thompkins.anita@epa.gov.

Attachment

cc: James Taft, Association of State Drinking Water Administrators

Suggested Directions for Homeowner Tap Sample Collection Procedures

Revised Version: February 2016

These samples are being collected to determine the lead and copper levels in your tap water. This sampling effort is required by the U.S. Environmental Protection Agency and your State under the Lead and Copper Rule, and is being accomplished through a collaboration between the public water system and their consumers (e.g. residents).

Collect samples from a tap that has not been used for at least 6 hours. To ensure the water has not been used for at least 6 hours, the best time to collect samples is either early in the morning or in the evening upon returning from work. Be sure to use a kitchen or bathroom cold water tap that has been used for drinking water consumption in the past few weeks. The collection procedure is described below.

1. Prior arrangements will be made with you, the customer, to coordinate the sample collection. Dates will be set for sample kit delivery and pick-up by water system staff.
2. There must be a minimum of 6 hours during which there is no water used from the tap where the sample will be collected and any taps adjacent or close to that tap. Either early mornings or evenings upon returning home are the best sampling times to ensure that the necessary stagnant water conditions exist. Do not intentionally flush the water line before the start of the 6 hour period.
3. Use a kitchen or bathroom cold-water faucet for sampling. If you have water softeners on your kitchen taps, collect your sample from the bathroom tap that is not attached to a water softener, or a point of use filter, if possible. Do not remove the aerator prior to sampling. Place the opened sample bottle below the faucet and open the cold water tap as you would do to fill a glass of water. Fill the sample bottle to the line marked "1000-mL" and turn off the water.
4. Tightly cap the sample bottle and place in the sample kit provided. Please review the sample kit label at this time to ensure that all information contained on the label is correct.
5. If any plumbing repairs or replacement has been done in the home since the previous sampling event, note this information on the label as provided. Also if your sample was collected from a tap with a water softener, note this as well.
6. Place the sample kit in the same location the kit was delivered to so that water system staff may pick up the sample kit.
7. Results from this monitoring effort and information about lead will be provided to you as soon as practical but no later than 30 days after the system learns of the tap monitoring results. However, if excessive lead and/or copper levels are found, immediate notification will be provided (usually 1-2 working days after the system learns of the tap monitoring results).

Call__________________at_______________if you have any questions regarding these instructions.

TO BE COMPLETED BY RESIDENT

Water was last used: Time_______________ Date_______________

Sample was collected: Time_______________ Date_______________

Sample Location & faucet (e.g. Bathroom sink): ________________________

I have read the above directions and have taken a tap sample in accordance with these directions.

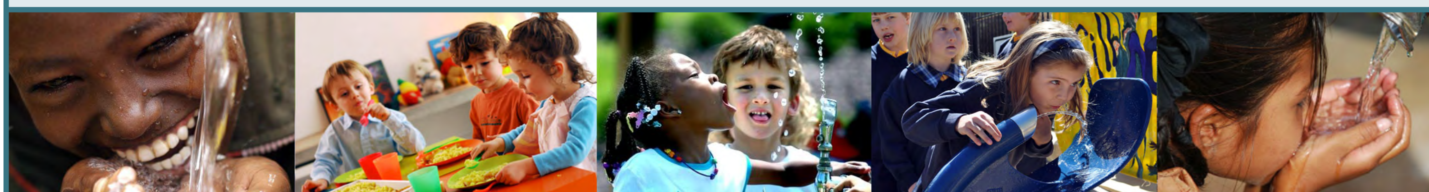
Signature__________________________________ Date___________________

ATTACHMENT

10

Drinking Water
Best Management Practices

For Schools and Child Care Facilities With Their Own Drinking Water Source



EPA 816-B-13-001
April 2013

Drinking Water Best Management Practices

For Schools and Child Care Facilities With Their Own Drinking Water Source

This guide is intended for use by school officials and child care providers responsible for the maintenance and/or safety of school and child care facilities including the drinking water. The purpose of this guide is to describe the importance of implementing best management practices for drinking water in schools and child care facilities and how a school or child care facility would go about implementing these practices. This guide is specifically designed for schools and child care facilities that have their own well and, therefore, are classified as a public water system. This guide is not a regulation itself, nor does it change or substitute for those provisions and regulations. Thus, it does not impose legally binding requirements on EPA, states, public water systems, schools or child care facilities. This guide does not confer legal rights or impose legal obligations upon any member of the public. While EPA has made every effort to ensure the accuracy of the information in this guide the obligations of the regulated community are determined by statutes, regulations or other legally binding requirements. In the event of a conflict between the information in this guide and any statute or regulation, this document would not be controlling.

Table of Contents

This document was prepared by the United States Environmental Protection Agency, Office of Ground Water and Drinking Water, and is based on EPA New England's guide titled, "*Are You Providing Safe Drinking Water at Your School? EPA-901-F-03001, May 2003.*"

What Decision Makers Should Know

On any given day in America nearly 50 million public school students spend a significant portion of their day in school buildings. Exposure to environmental hazards in schools can negatively impact the health of children and school staff. Moreover, studies have shown that poor indoor environments in schools have negative impacts on teacher productivity and student performance.[1,2,3]

Schools and child care facilities receive their drinking water from either nearby municipal water systems or their own on-site drinking water source (i.e., wells). Facilities that receive their drinking water from their own water source are operating a public water system (PWS) and are required to comply with a series of regulations. There are also best management practices that schools and child care facilities should follow if they operate their own public water system. This guide provides an overview of public water systems and regulations that apply to them. Additionally, this guide provides best management practices for the following:

- Complying with regulations that apply to public water systems;
- Protecting sources of drinking water;
- Maintaining and sanitizing water fountains and faucet screens/aerators;
- Voluntarily testing for lead in addition to complying with the Lead and Copper Rule;
- Conducting routine measures for reducing lead exposure in drinking water; and
- Implementing additional measures such as water security, water conservation and educating students about drinking water.

Public Water Systems

A public water supply system is one that provides tap water for human consumption to 15 or more service connections or serves an average of 25 people at least 60 days each year. Water for human consumption includes water for drinking and cooking, food preparation,

Top Five Actions to Protect Drinking Water at Schools and Child Care Facilities

1. Clean drinking water fountains daily using procedures found in this guide.
2. Clean debris out of all outlet screens or aerators on a regular basis using the procedures found in this guide.
3. Test the facility's drinking water for lead. If lead is present, follow the actions for addressing lead contamination outlined in this guide.
4. Ensure the source of your drinking water supply is free from contamination by using the recommendations found in this guide.
5. If elevated lead levels are found, regularly flush all water outlets used for drinking or food preparation and install point-of-use devices, to provide additional treatment of drinking water at the outlet.

[1] Vinciullo F. The relationship between multi-component school health programs and school achievement. Paper presented at: Annual Conference of the National Association of School Nurses, 2008; Albuquerque, NM.

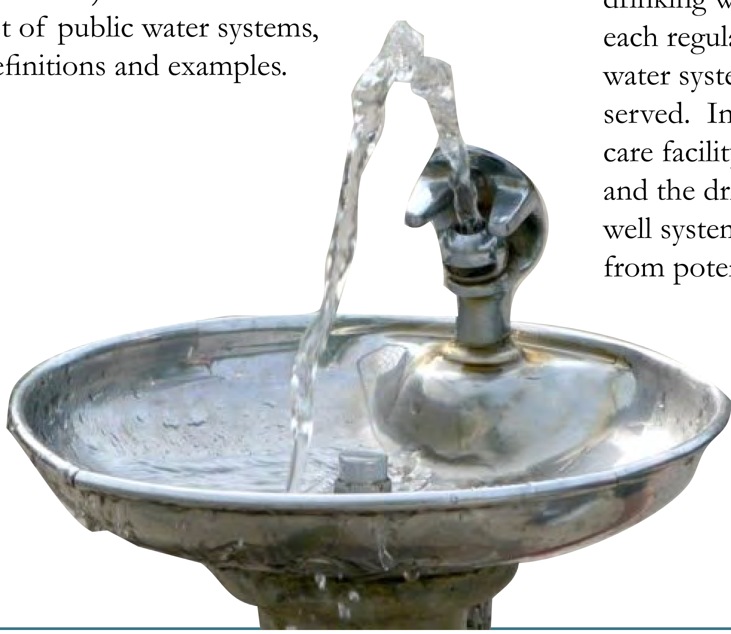
[2] Stolz A, Knickelbein, A., Coburn, S. Linking coordinated school health to student success. Paper presented at: Annual Conference of the National Association of School Nurses, 2008; Albuquerque, NM.

[3] NRC (National Research Council). Green Schools: Attributes for Health and Learning. Washington D.C.: The National Academies; 2006.

Table 1. Types of Public Water Systems

	Definition	Examples
Community water system	Deliver water to 15 or more service connections OR at least 25 residents are served by the system year-round	Subdivisions, mobile home parks, water districts, cities and towns
Non- transient non-community water systems	Serve the same non-resident persons each day for more than 6 months per year	Schools, child care facilities and businesses
Transient non-community water systems	A public water system that provides water in a place where people do not remain for long periods of time	Restaurants, rest stops, summer camps and campgrounds

hand washing and bathing. Most schools and child care facilities that are PWSs are typically non-transient, non-community water systems (NTNCWS), as they serve the same non-resident population each day for more than six months per year. Other types of water systems include community water systems (CWS) and transient, non-community water systems (TNCWS). See Table 1 for a list of public water systems, definitions and examples.



Regulations That Apply to Your Public Water System

As the number of drinking water regulations grows, EPA, states and other organizations continue to provide assistance to public water systems to ensure compliance and help public water systems provide safe, high-quality drinking water (Table 2). Compliance with each regulation depends on what type of public water system you are and the number of people served. In addition, most schools and child care facility PWSs are served by ground water, and the drinking water regulations for these well systems address chronic and acute impacts from potential contaminants.

Table 2. Regulations that Apply to Non-Transient, Non-Community Water Systems*

Regulation	Goal & Importance	Applicability
Total Coliform Rule (http://water.epa.gov/lawsregs/rulesregs/sdwa/tcr/index.cfm)	Seeks to limit bacteria, parasites and viruses which can cause health problems when humans ingest them in drinking water by using coliform bacteria as an indicator.	All public water systems
Ground Water Rule (http://water.epa.gov/lawsregs/rulesregs/sdwa/gwr/index.cfm)	Provides for increased protection (via monitoring) against microbial pathogens in public water systems that use ground water sources. It establishes an approach to focus on ground water systems that are susceptible to contamination and requires ground water systems that are at risk to take corrective action.	All public water systems that use ground water.
Stage 1 Disinfectants and Disinfection Byproducts Rule (http://water.epa.gov/lawsregs/rulesregs/sdwa/stage1/factsheet.cfm)	Reduces exposure to disinfection byproducts for customers, strengthening public health by decreasing potential cancer, reproductive and developmental health risks from DBPs.	Community water systems and non-transient non-community systems, including those serving fewer than 10,000 people, that add a disinfectant to the drinking water during any part of the treatment process.
Stage 2 Disinfectants and Disinfection Byproduct Rule (http://water.epa.gov/lawsregs/rulesregs/sdwa/stage2/index.cfm)	Strengthen public health protection by tightening compliance monitoring requirements for two groups of disinfection byproducts (DBPs): trihalomethanes (THMs) and haloacetic acids (HAAs). This rule is intended to reduce potential cancer, reproductive and development health risks from DBPs.	Applies to community and non-transient, non-community water systems that add and/or deliver water that is treated with a primary or residual disinfectant other than ultraviolet light.

Regulation	Goal & Importance	Applicability
Lead and Copper (http://water.epa.gov/lawsregs/rulesregs/sdwa/lcr/index.cfm)	Requires water systems to control corrosivity and collect tap samples from sites served by the system that are more likely to have plumbing materials containing lead. This rule provides monitoring techniques and response actions for lead and copper, which may cause a variety of health problems.	All community and non-transient, non-community water systems.
Phase II/V Rules (http://water.epa.gov/lawsregs/rulesregs/sdwa/chemicalcontaminantrules/basicinformation.cfm)	Establishes monitoring and reporting requirements and allowable limits for inorganic, volatile organic and synthetic organic contaminants. This provides important public health protection through the reduction of chronic risks from cancer, organ damage and circulatory, nervous and reproductive system disorders.	All community and non-community water supplies.
Arsenic Rule (http://water.epa.gov/lawsregs/rulesregs/sdwa/arsenic/regulations.cfm)	Limits arsenic in water to 10 parts per billion (ppb). This rule is intended to reduce risks of cancer and cardiovascular, pulmonary, immunological, neurological and endocrine effects that result from exposure to arsenic.	All community and non-transient, non-community water systems.
Public Notification Rule (http://water.epa.gov/lawsregs/rulesregs/sdwa/publicnotification/index.cfm)	Requires systems to notify the public any time a water system violates national primary drinking water regulations or has other situations posing a risk to public health. This rule ensures that consumers will always know if there is a problem with their drinking water.	All public water systems violating national primary drinking water regulations, operating under a variance or exemption or having other situations posing a risk to public health.

*Almost all school and child care facility water supplies rely on ground water so additional surface water regulations are not highlighted here.

Source Water Protection

One of the best ways to be sure you are providing clean water is to ensure the source of your supply is free from contamination. State drinking water agencies have identified wellhead protection areas, land areas that provide water to public supply wells and surface water supplies. If your facility receives water from an on-site well water system its protection area is likely to include the school or child care facility property and neighboring properties.

State drinking water programs are required to complete a source water assessment for all public drinking water systems, which include information about the location of each drinking water system's protection area and about activities that could potentially contaminate the drinking water source, including ground water wells (see Table 3). You can contact your state or local drinking water program and ask if they have a map showing your protection area.

You should also evaluate potential contamination sources on your facility's property that may impact water quality and make plans to eliminate any risk they pose. If the facility uses an on-site septic system, evaluate the setback between it and your well, and confirm it meets state and local requirements. Some areas to check within the facility are sinks and floor drains in facility maintenance areas, cleaning supply areas, science laboratories, vocational shops and art classrooms. It is a good idea to post signs over sinks indicating chemicals cannot be disposed of down the drain. Protecting the quality of your water before it is contaminated is much more cost-effective than trying to treat or replace a supply that has been contaminated.

Additional information is available from EPA at: http://water.epa.gov/infrastructure/drinkingwater/sourcewater/protection/index.cfm

Table 3. Potential Contamination Sources

Potential Contaminant	Source
Bacteria/Pathogens	Septic systems, animal feedlots, manure storage
Nitrogen	Septic systems, lawn fertilizers, agricultural fertilizers, manure storage, animal feedlots
Sodium, Chloride	Road salt storage facilities, major roads when road salt is applied
Oils & Hydrocarbons	Gas stations, fuel oil distributors, underground home heating oil tanks
Chlorinated Solvents	Automotive services and repair facilities, dry cleaners, industrial facilities

Addressing Cross Contamination

It is important to be aware of cross connections within your facility as contamination can occur when there is a connection between your building's drinking water system (pipes) and another liquid or substance. Cross contamination from backflow of harmful substances may occur as a result of reduced pressure in the drinking water system or because of increased pressure in the contaminating source. Be aware, cross contamination may not be immediately apparent because a contaminant may not have a strong taste, odor or color.

Cross contamination can happen at facilities under a number of circumstances, including:

- When a tube or hose from a faucet is submerged in a solution, in a beaker or in a custodian's sink;
- A pipe is connected from a drinking water source to chemical lab equipment, a storage tank or cafeteria equipment; or
- A hose is dropped into a waste/floor drain in an automotive shop, boiler room or cafeteria.

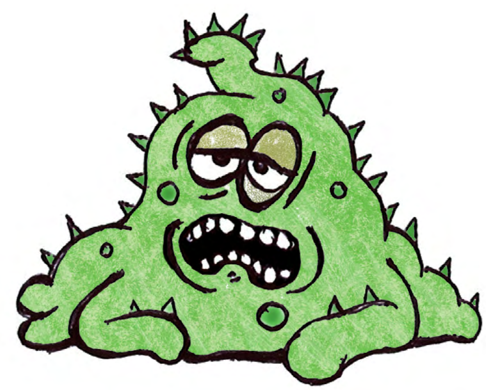
Other sources of potential cross contamination include cross connections between the drinking water system and heating system boilers, water coolers, lawn sprinkler systems, fire sprinkler systems or soft drink machines.

Cross contamination can be prevented by using backflow prevention devices that only allow water to flow in one direction, from the source to the tap, so liquid cannot flow back

A garden hose creates a dangerous cross connection between potable and non-potable water.

down the tap and contaminate the water in the distribution system. Devices should be tested annually by a certified professional. If you have questions about cross connections and contamination, contact the local building/plumbing inspector or for more information on cross contamination please visit: http://water.epa.gov/infrastructure/drinkingwater/pws/crossconnectioncontrol/index.cfm

Bacteria



Bacteria are present throughout our environment. They have adapted to live and reproduce in a variety of environments, including inside animals and humans, and in water, soil and food. If bacteria are present in drinking water sources, most are removed during the disinfection process. However, some may survive and enter the distribution system (the building's pipes and plumbing). Bacteria can also grow within the plumbing system, water fountains and faucets. Therefore, it is important to regularly clean your facility's water fountains, faucets and hot water tanks.

Lead

Understanding Lead Exposure

Lime build-up on mouthpiece and protective guard of drinking fountain.

As a public water system, your school or child care facility is required to comply with the Lead and Copper Rule (see page 2, Table 2. Regulations that Apply to NTNCWSs). The Lead and Copper Rule was developed to protect public health by minimizing lead and copper levels in drinking water. Public water systems are required to collect a number of tap samples based on the daily population served (see Table 4). However, EPA encourages schools and child care facilities to conduct additional voluntary lead testing at ALL water outlets in their facility used for drinking or food preparation. Because you cannot see, taste or smell lead in your drinking water, testing the facility's water is the only sure way to know if there are elevated levels in the water. School officials and child care providers need to know whether the drinking water that students, teachers and staff consume contains elevated levels of lead because exposure to lead can cause serious health problems, particularly for young children.

The "Lead and Copper Rule: Quick Reference Guide for Schools and Child Care Facilities that are Regulated Under the Safe Drinking Water Act" provides an overview of the Lead and Copper Rule and sampling requirements. The guide is available at: http://water.epa.gov/infrastructure/drinkingwater/schools/upload/2006_1_11_schools_lead_qrg_lcr_schools.pdf

> In addition to complying with the Lead and Copper Rule, it is recommended that schools and child care facilities that are public water systems conduct additional testing for lead as children are particularly susceptible to health effects from lead.

Health Effects of Lead

Lead can cause serious health problems if too much enters your body from drinking water or other sources. Some facts about lead exposure include:

- Infants, young children and pregnant women are at greatest risk to lead exposure;
- Increased lead levels have been shown to cause damage to the brain and kidneys;
- Increased lead levels interfere with the production of red blood cells that carry oxygen to all parts of your body;
- Scientists have linked the effects of lead on the brain with lowered intelligence quotient (IQ) in children;
- Adults with kidney problems and high blood pressure can be affected by lower levels of lead more than healthy adults;
- Lead is stored in the bones and it can be released later in life; and
- During pregnancy, the fetus receives lead from the mother's bones which may affect brain development.

In addition to protecting human health, facilities that voluntarily test drinking water and make information about their program available to the public may increase the public's confidence in the school or child care facility's water quality.

Table 4. Lead and Copper Tap Monitoring Requirements Under the Lead and Copper Rule

School or Child Care Facility Daily Population Served	Number of Lead and Copper Tap Sample Locations
10,001 – 50,000	60
3,301 – 10,000	40
501 – 3,300	20
101 – 500	10
100 or less	5

Source: *Lead and Copper Rule: Quick Reference Guide for Schools and Child Care Facilities that are Regulated Under the Safe Drinking Water Act*

How Lead Gets into Drinking Water

Soft water has a low pH, which is corrosive. Other factors however also contribute to the corrosion potential of the water and include water velocity, temperature, alkalinity, type of disinfectant, the age and condition of plumbing and the amount of time water is in contact with plumbing. Of note, recent construction work on your facility's plumbing system (e.g., pipe replacement and utility lead service line replacement with copper components) may result in corrosion of remaining lead pipes or disturbance of settled debris within larger pipes in the system which may create new sources of contamination. The occurrence and rate of corrosion depend on the complex interaction between a number of these and other chemical, physical and biological factors.

Example of lead pipes in a plumbing system.

According to the Lead and Copper Rule there are steps that public water systems must take to reduce the corrosiveness of the water if the system has high levels of lead. However, if the plumbing in the facility is made of lead or contains lead parts, corrosion may occur simply by water moving through the plumbing.

Reduction of Lead in Drinking Water Act

A new requirement, signed into law by President Obama in January 2011, will further reduce lead in pipes, pipe fittings, plumbing fittings and fixtures to a weighted average of 0.25 percent. The Reduction of Lead in Drinking Water Act redefines "lead free" under the Safe Drinking Water Act to mean: not containing more than 0.2 percent lead when used with respect to solder and flux, the material used to join pipes and fixtures together (current law) and not more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings and fixtures. The new requirements will become effective in January 2014.

Potential Sources of Lead in Drinking Water

- Lead pipes in plumbing:
  - Dull gray in color and will appear shiny when scratched
  - Banned since 1986 and not widely used since the 1930s
- Copper pipes joined by lead solder:
  - Solder will be dull gray in color and will appear shiny when scratched
  - Banned since 1986 and many communities banned prior to 1986
- Brass pipes, faucets, fittings and valves:
  - May contain alloys of lead
- Sediments in screens on faucets may contain lead:
  - Debris from plumbing can collect on screens
- Water service line from the well to the facility is made of lead:
  - Pipes that carry water to the facility may contain lead
- Water fountains in the facility may contain lead parts:
  - Specific brands of water fountains contain lead parts or have lead lined water tanks
  - Since 1988 it has been mandated that water fountains be lead free, but older facilities may have outdated models.

Copper pipes joined by lead solder.

Copper

Copper is widely used in household plumbing, sometimes without proper consideration of water quality. Excess copper exposure can cause stomach and intestinal distress, liver or kidney damage and complications of Wilson's disease. Children's bodies absorb more lead and copper than the average adult because of their rapid development. Copper leaches into water through corrosion of the plumbing system – primarily from pipes, but fixtures, faucets and fittings made of brass can also be a source. The amount of copper in your water strongly depends on the acidity and types and amounts of minerals in the water, whether or not it is oxygenated or disinfected, how long the water stays in the pipes, the length of time the pipes have been in use and the water's temperature. When the water pH is below neutral (7) and when the alkalinity of the water (bicarbonate content) is high, very high concentrations of copper can persist for many years in copper pipes and fittings found in new construction and remodeled or renovated buildings. Blue staining of water, sinks and fixtures can be an indicator of extreme copper plumbing corrosion.

Drinking Water Best Management Practices

Bacteria

Drinking Water Fountains

Drinking water fountains should be cleaned on a daily basis to reduce possible bacterial contamination. Fountains should also be included in the regular flushing of your facility's plumbing system (as described in the section, Routine Measures for Reducing Lead Exposure).

Drinking Water Fountain Daily Cleaning Procedures[1]

The following procedures should be considered for daily cleaning:

- Gather necessary materials and suggested protective equipment;
- Obtain Material Safety Data Sheets (MSDS) for all chemicals being used and review manufacturer's instructions for use;
- Check the flow of the water to make sure there is a constant stream;
- Spray disinfectant cleaner solution on the inside surfaces of the mouthpiece and protective guard;
- Using a scrub brush, scrub the inside and outside of the mouthpiece and protective guard;
- Rinse the mouthpiece and protective guard with water; and
- Wipe drinking fountain surfaces with a clean cloth dampened with water.

It is also important to clean drinking water fountains to remove lime and calcium build-up. Lime and calcium build-up can begin to block the water from coming through the mouthpiece and going down the drain.

[1] Iowa State University Facilities Planning & Management – Custodial Task Procedures

Removing Lime Build-up on Drinking Fountains or Ice Machines

- Spray descaler onto the bowl and back of the drinking fountain;
- Use a clean, lint-free cloth saturated with the descaler. Apply to the surfaces with the lime build-up. Let stand for the length of time recommended on the label;
- Wring out all excess solution from the cloth;
- Wipe the surface clean with the cloth. If necessary, use a brush or scrub pad to remove hard build-up. Be careful not to damage surfaces while scrubbing; and
- Thoroughly rinse the surfaces with clean water.

For a list of EPA-approved disinfectants to use in your facility, please visit: http://www.epa.gov/oppad001/chemregindex.htm

Hot Water Tanks

Hot water tanks are susceptible to the development of biofilm, which is a surface deposit of bacteria that accumulates creating a slime layer. Similar to the plaque that forms on teeth biofilms accumulate over time. It is recommended that you consult with an experienced professional to have your hot water tank periodically cleaned to remove existing biofilms and sediments.[2]

[2] National Environmental Services Center, Tech Brief. Biofilm Control in Distribution Systems, Summer 2008, Vol. 8, Issue 2.

Lead

Voluntary Lead Testing

In addition to complying with the Lead and Copper Rule, EPA recommends that schools and child care facilities conduct additional voluntary lead testing at ALL water outlets used for drinking and food preparation. EPA developed the 3Ts (Training, Testing and Telling) for Reducing Lead in Drinking Water in Schools, Revised Technical Guidance to help schools and child care facilities implement simple strategies for managing the health risks of lead in drinking water. Following the 3Ts guidance does not replace requirements for complying with the Lead and Copper Rule (see page 2, Table 2. Regulations that Apply to Non-transient, Non-community Water Systems).

The 3Ts include:

- **Training** school and child care facility officials to raise awareness of the potential occurrences, causes and health effects of lead in drinking water, assist facilities in identifying potential areas where elevated lead may occur, and establish a testing plan to identify and prioritize testing sites;
- **Testing** drinking water in the facility to identify potential problems and take corrective actions as necessary; and
- **Telling** students, parents, staff and the larger community about monitoring programs, potential risks, the results of testing and remediation actions.

The 3Ts for Reducing Lead in Drinking Water in Schools, Revised Technical Guidance is available at: http://water.epa.gov/infrastructure/drinkingwater/schools/guidance.cfm#3ts

The 3Ts for Reducing Lead in Drinking Water in Child Care Facilities is available at: http://

water.epa.gov/infrastructure/drinkingwater/schools/guidance.cfm#3ts

EPA also developed the, "What Your School or Child Care Facility Should Know About Lead in Drinking Water" DVD available for order from the National Service Center for Environmental Publications (NSCEP) at: http://water.epa.gov/infrastructure/drinkingwater/schools/guidance.cfm[3]

Test the Facility's Drinking Water for Lead

It is important to test all of the drinking water outlets in your facility, especially those that provide water for drinking, cooking and preparing juice and infant formula. Lead in drinking water can be a localized problem and can vary from tap to tap. Just because there

[3] Also available by calling NSCEP at 1-800-490-9198. For International Orders: Call NSCEP at (301) 519-6640 or e-mail NSCEP at nscep@bps-lmit.com

is lead getting into your water from one outlet does not mean that all your taps are vulnerable. At the same time, just because one tap sample is free from lead does not mean that all your taps are clear. It is a good idea to test ALL outlets including drinking fountains and faucets where water is used for drinking or cooking. Unusual sources of drinking water, such as locker room shower heads and other non-drinking water taps used to fill water jugs and carboys, should also be included when testing for lead.

There are different sampling techniques used to comply with the Lead and Copper Rule and a voluntary lead testing program. The 3Ts for Reducing Lead in Drinking Water in Schools, Revised Technical Guidance, provides step-by-step instructions on how to properly collect voluntary samples and test your facility's drinking water outlets for lead.[4] A list of certified laboratories for lead testing is available from your state or local water authority. Testing costs between $20.00 and $100.00 and the laboratory will provide instructions on proper sampling procedures.

The concentrations of lead in your drinking water samples will be reported in metric form, such as milligrams per liter (mg/L) or micrograms per liter (µg/L), or as parts per million (ppm) or parts per billion (ppb). One ppm is roughly equivalent to one cup of a substance in a swimming pool. One ppb is about one drop of a substance in a swimming pool.

Under the Lead and Copper Rule, EPA established an action level of 15 ppb for lead in a one-liter sample, based on the 90th percentile level of tap water samples (no more than 10 percent of your samples can be above the action level). If the 15 ppb threshold is exceeded, the Lead and Copper Rule requires corrosion control actions to be taken by the water system operator to reduce lead concentrations.

Under the 3Ts guidance, EPA recommends that schools and child care facilities also take action to correct issues with lead fixtures and piping within the school if samples from any ONE drinking water outlet shows lead levels greater than 20 ppb.

If your sink has separate hot and cold water knobs, samples should be collected from cold water, as hot tap water is not recommended for food preparation or direct consumption. If you have one lever, be sure to turn it on to the cold water side before collecting your sample.

Routine Measures for Reducing Lead Exposure

Whether you have tested your water or not, or even if your water has shown low levels of lead, there are basic practices that will further reduce the potential for lead exposure at your facility as well as reduce sediment in your water.

Develop a flushing plan

- Determine how water enters and flows through your facility by developing a plumbing profile[5]. Consult with your maintenance personnel, a licensed plumber or a local water service to develop a plumbing profile;
- Locate all water outlets that are used for consumption;
- Identify the drinking water outlet(s) furthest from the main water service line (Note: If your facility has multiple wings there will be more than one outlet farthest from the main service line);

[4] See Section II: Testing of the 3Ts for Reducing Lead in Drinking Water in Schools, Revised Technical Guidance, available at: http://water.epa.gov/infrastructure/drinkingwater/schools/guidance.cfm

[5] See Section II: Testing of the 3Ts for Reducing Lead in Drinking Water in Schools, Revised Technical Guidance, available at: http://water.epa.gov/infrastructure/drinkingwater/schools/guidance.cfm

- Determine the best order to open and flush drinking water outlets, starting with those farthest from the main service line;
- Identify options for collection and non-potable re-use of flushed water (e.g., plant watering); and
- Develop a system for accountability, including identifying one person who is in charge and developing a record keeping system.

Flush all water outlets used for drinking or food preparation

- At the start of each day, before using any water for drinking or cooking, flush the cold water faucet by allowing the water to run for a period of time. Contact your state or local drinking water program to find out what the recommended flushing time is for your facility based on system size and pipe diameter. Flushing should be done for all water outlets used for drinking or food preparation.
- Flushing, or opening up a tap and letting the water run, replaces the stagnant water that may have been in contact with lead-containing plumbing fixtures overnight or over the weekend. The longer water is exposed to lead pipes or solder the greater the likelihood of lead contamination.
- Flushing times vary depending on your buildings pipes and outlets, refrigerated water fountains can take as long as 15 minutes to properly flush out the reservoir.
- If many taps need flushing, the tap furthest from the main pipe should be opened for approximately 10 minutes to flush out the main pipe. Then, individual drinking water taps should be flushed to rid stagnant water from the pipes.[6] Keep in mind that if your facility has more than one wing there may be more than one tap that is furthest from the main water line.

Use only cold water to prepare food and drinks

- Hot water dissolves lead more quickly than cold water and is therefore more likely to have greater amounts of lead.
- If hot water is needed, water should be drawn from the cold tap and heated.
- Use only thoroughly flushed water from the cold water tap for drinking and when making mixed baby formula, juices or foods.

Clean debris out of all water outlet screens or aerators on a regular basis

- Small screens on the end of a faucet can trap sediments containing lead. Note: Aerators are often used to regulate flow, reduce splash and conserve water. Check to see if your faucets have aerators, since not all faucets have them.

[6] Lead in School Drinking Water Program (http://www.mass.gov/dep/water/drinking/sclcatlg.pdf).

Faucet Aerators

Many taps that are used to provide water for human consumption have an aerator as part of the faucet assembly. Aerators serve to introduce air into the water flow which makes it feel as if a larger water flow is coming out of the tap. The use of aerators is a common water conservation practice. Screens are not intended to remove contaminants in the water, but may trap sediment or debris as water passes through the faucet. Lead bearing sediment may end up in drinking water from physical corrosion of leaded solder and can build up in the aerator over time.

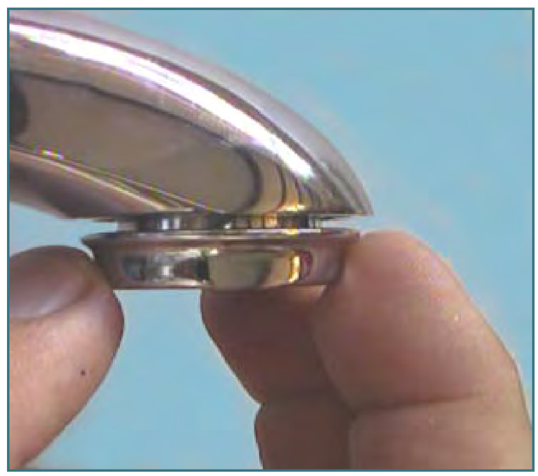
Faucet Aerators Cleaning Procedures

- Remove the aerator by twisting off with hands or pliers;

- One or more parts are contained within the aerator. Note the order and orientation of the parts as you remove them;

- Rinse the pieces with water and brush off the debris. For deposits that are difficult to remove, soak the parts in water for a few minutes and scrub with a toothbrush. Backwashing aerator components is also an effective cleaning method for many aerator types. Hold the removed aerator upside down under flowing water to backwash screens and mesh filters;

- If any parts are cracked or broken, replace them. If the washer has hardened it should be replaced; and
- Reassemble the aerator, screw it back onto the faucet and hand-tighten.



It is not recommended that aerators be removed from faucets immediately before sampling for lead as the sample will fail to identify the typical available contribution of particulate lead from that tap and thus additional actions needed to reduce exposure to lead in drinking water will fail to be taken.

However, if the results from the initial sample are above the action level, you can consider taking a second sample to determine whether particulate matter is the source of lead. For this sample, the aerator would be cleaned or removed prior to sampling so that the two samples could be compared.[7] It is advised that a regular cleaning schedule be established for aerators.

Respond to Elevated Lead Levels

If your system exceeds the lead action level under the Lead and Copper Rule, specific actions need to be taken. These required actions include public education, water quality parameter monitoring, source water monitoring and treatment and corrosion control treatment.[8]

Under the 3Ts guidance, EPA recommends that schools and child care facilities take action if samples from any ONE drinking water outlet show lead levels greater than 20 ppb. Any outlet with test results above this level should not be used until the source of the contamination is found and the lead levels are reduced to 20 ppb or less. If you are going to stop using an outlet due to high lead levels you should place a physical barrier such as tape or an illustrative sign over the faucet so that everyone knows it should not be used until it is fixed. In addition, you should encourage parents to have their children's blood tested for lead if high lead levels are detected in the water. It is recommended that facilities develop Standard Operating Procedures (SOPs) for responding to elevated lead levels and administrators or directors should be encouraged to communicate this information to parents (or teachers) so they can protect their children. The following remedies can be used to respond to elevated lead levels.

Provide an alternative lead-free drinking water

- Bottled water can be used as a temporary measure; and
- Make sure the bottled water distributor meets federal and state bottled water quality standards (which are different than tap water) and that their filtration technology is National Sanitation Foundation International (NSF) certified for lead reduction (http://www.nsf.org).

> Prior to replacing fixtures when elevated lead levels are determined, be sure to test the new fixtures to ensure the fixtures are "lead free." If you are purchasing a large volume of faucets ask the manufacturer or vender to test the faucets with your local tap water to make sure no lead is leached out of the faucets. If you are only purchasing a few faucets make sure the fixtures are certified according to NSF/ANSI Standards 61 and 372 for lead reduction. You can search for NSF drinking water components at: http://www.nsf.org/certified/pwscomponents/

Remove sources of lead in the plumbing system

These remedies are most appropriate for localized contamination problems and are best handled by a licensed plumber:

- Replace solder joints with lead-free joints;
- Replace the outlet or fixture/faucet with "lead-free" materials (according to NSF/American National (ANSI)

[7] EPA, Oct 2006. Memorandum: Management of Aerators during Collection of Tap Samples to Comply with the Lead and Copper Rule. Available at: http://water.epa.gov/lawsregs/rulesregs/sdwa/lcr/upload/2006_10_27_lcrmr_memo_tapsamples-aerators_10202006.pdf

[8] The Lead and Copper Rule: Quick Reference Guide for Schools and Child Care Facilities that are Regulated Under the Safe Drinking Water Act, available at: http://water.epa.gov/infrastructure/drinkingwater/schools/upload/2006_1_11_schools_lead_sqrg_lcr_schools.pdf

Standards 61 and 372);
- Replace piping with "lead-free" materials; and
- Be sure to check product packaging to confirm item is NSF certified as lead free.

Install point-of-use/point-of-entry treatment devices

- A point-of-use (POU) device is a filtration system, such as a carbon filter, that can be installed directly on a drinking water outlet. A point-of-entry (POE) device is a filtration system that is installed where the water main enters the facility and treats all the water in your building.
- Use a device that is certified by NSF International[9] to remove lead.

- Maintaining POU and POE treatment devices is very important. Refer to the manufacturer's instructions for maintenance procedures. If not maintained properly, some treatment devices may increase lead and other contaminant levels.
- If using a POU or POE device you should conduct follow up testing to make sure the water is still below the action level.
- With the use of a POU or POE device, flushing is not necessary.
- If using POU or POE devices on some faucets, but not all, make sure that faucets without a POU or POE device are clearly labeled that they are not for drinking or cooking water.

[9] NSF/ANSI Standard 61 explanation http://www.nsf.org/business/water_distribution/faq.asp#lead

Communicate with your Community about the Lead Testing Program

It is important to communicate early and often about your testing plans, results and next steps. Telling parents and staff about your voluntary lead testing program will demonstrate your proactive commitment to protecting the health of your students and staff and build confidence in your facility's ability to provide a safe and healthy environment, whether or not elevated lead levels are found in your facility.

Additional Considerations

Copper

Testing for copper may be appropriate if your water is somewhat acidic (with a pH below 7) and when it is disinfected. Copper corrosion decreases steadily over time under normal water usage conditions, but elevated copper levels can persist for many years in new copper pipes. If you are experiencing blue staining of your water, sinks, bathtubs or showers, or if there is growing blue encrustation on the fixtures, this may be an indicator of high copper levels, and you should have your water tested for both copper and lead. If you are experiencing elevated copper levels in the drinking water system, the easiest method for reducing exposure to copper is to flush the system to avoid drinking or cooking with water that has been in contact with the plumbing system for more than four hours. Particularly when first drawing water in the morning, flush the system by running the cold water faucet long enough to get fresh water from the main, which could vary from about two minutes to five or ten minutes, depending on the size and length of the pipes and the flow rate. Each faucet where water is drawn for drinking or cooking purposes should be flushed separately, starting with the faucet or outlet farthest from where the fresh water enters the building.

Water Security[10]

Work with your local emergency planning committee to assess the vulnerability of your facility's drinking water system and be sure everyone working at your facility is involved in this effort and understands their responsibilities.

- Prepare or update an emergency response plan. Make sure all employees help develop the plan and receive training on it.
- Post updated emergency 24-hour numbers at your facilities in highly visible areas (e.g., pumphouse door, vehicles, office) and distribute them to key personnel and local response officials.
- Get to know your local police and fire departments and ask them to add your buildings to their routine rounds. Practice emergency response procedures with local police, emergency responders and public health officials.
- Fence and lock your drinking water facilities and vulnerable areas (e.g., wellhead, hydrants, manholes, pumphouse and storage tanks).
- Lock all entry gates and doors, set alarms and post signs to indicate illegal entry. Do not leave keys in equipment or vehicles at any time.
- Install good lighting around your pumphouse, treatment facility and parking lot.
- Identify existing and alternate water supplies and maximize use of backflow prevention devices and interconnections.
- Use your Source Water Assessment information (as described on page 5) to work with businesses and homeowners that are listed as potential sources of contamination in order to lessen their impact on your water source.
- Lock monitoring wells to prevent vandalism or direct contamination by moving vent pipes inside the pump house or fencing/screening them in.
- In case of an emergency, first call 911 then follow your emergency response plan.

Additional water security resources include:

Top 10 List for Drinking Water Security and Emergency Preparedness (EPA)
Provides tips to enhance security of small ground water systems.
Website: http://water.epa.gov/infrastructure/watersecurity/upload/2004_04_01_watersecurity_fs_security_smallsuppliers_top10.pdf

Security Vulnerability Self Assessment Guide for Small Drinking Water Systems (Association of State Drinking Water Administrators in coordination with National Rural Water Association)
Guidance is available for small systems, such as schools and child care facilities, to complete a security vulnerability assessment of their drinking water system.
Contact: Association of State Drinking Water Administrators at: http://www.asdwa.org

[10] Adapted from EPA New England, Drinking Water Security and Emergency Preparedness (http://water.epa.gov/infrastructure/watersecurity/upload/2004_04_01_watersecurity_fs_security_smallsuppliers_top10.pdf).

Water Conservation

Schools and child care facilities use large amounts of water every day for heating and cooling systems, restrooms, drinking water, cooking, locker rooms, cafeterias, laboratories and outdoor playing fields and lawns. Options to reduce water use for these facilities include:

- Consider replacing old equipment such as dishwashers with energy and water saving devices;
- Repair water leaks and leaky toilets;
- Install aerators and automatic shut-off devices on faucets;
- Use low-flow shower heads and timer shut-off devices to reduce water use during showers;
- Install timers on outdoor sprinklers;
- Install toilet dams on older models;
- Replace plants and grasses that require a lot of water with native sustainable vegetation; and
- Use rain barrels and teach the students about green roofs.

WaterSense

The WaterSense program promotes water efficiency and enhancing the market for water-efficient products, programs and practices. Since the program's inception in 2006, WaterSense has helped consumers save a cumulative 46 billion gallons of water and $343 million in water and sewer bills. For additional information, visit: http://www.epa.gov/watersense/

Teaching Students about Drinking Water

There are a variety of ways to teach students about drinking water:

- Early science classes demonstrating the water cycle;
- Mathematics classes demonstrating supply and demand principles;

- History lessons discussing early settlement patterns near water sources and our nation's system of government, laws and regulations provide important knowledge for water resource decision-making;
- Involve students in the voluntary lead testing program to make it a teaching moment, ensuring that the students wear proper safety equipment and are not exposed to lead; and
- Engage high school science classes or local universities to conduct quick screening tests for devices identified as meeting the application needs and NSF International requirements to verify performance.

EPA has developed numerous resources and activities for students and teachers, including:

Drinking Water in Schools and Child Care Facilities (EPA)
Provides multiple resources regarding lead in drinking water, including health information, an overview of laws and regulations and guidance. Website: http://water.epa.gov/infrastructure/drinkingwater/schools/index.cfm

Kid's Stuff: Drinking Water and Ground Water (EPA)
Provides activities and materials for students and teachers for grades K-3, 4-8 and 9-12. Website: http://water.epa.gov/learn/kids/drinkingwater/index.cfm

Water Science and Technology for Students and Educators (EPA)
Water-related activities and resources for students and teachers.
Website: http://water.epa.gov/learn/resources/index.cfm

That Magnificent Ground Water Connection (New England Interstate Water Pollution Control Commission in coordination with EPA)
Classroom activities for students demonstrating the many characteristics, uses and threats to ground water resources in New England. Available for grades K-6 and 7-12.
Selected activities are available at: http://www.epa.gov/region1/students/teacher/groundw.html

Resources

3Ts for Reducing Lead in Drinking Water in Schools
Provides detailed guidance for schools that receive their drinking water from municipal water supplies regarding training and testing for and communicating about lead in drinking water.
Website: http://water.epa.gov/infrastructure/drinkingwater/schools/guidance.cfm#3ts

3Ts for Reducing Lead in Drinking Water in Child Care Facilities
Provides detailed guidance for child care facilities that receive their drinking water from municipal water supplies regarding training and testing for and communicating about lead in drinking water.
Website: http://water.epa.gov/infrastructure/drinkingwater/schools/guidance.cfm#3ts

Lead and Copper Rule: A Quick Reference Guide for Schools and Child Care Facilities that are Regulated Under the Safe Drinking Water Act
Provides an overview of the Lead and Copper Rule requirements, including sampling, compliance and public education requirements.
Website: http://water.epa.gov/infrastructure/drinkingwater/schools/upload/2006_1_11_schools_lead_sqrg_lcr_schools.pdf

EPA's Website on Lead
http://www.epa.gov/lead/

EPA's Website on Lead in Drinking Water
http://water.epa.gov/drink/info/lead/index.cfm

EPA's Website on Reducing Lead in Drinking Water in Schools and Day Care Centers
http://water.epa.gov/drink/info/lead/schools_index.cfm

Centers for Disease Control and Prevention's Website on Lead
http://cdc.gov/lead/

National Lead Information Center Hotline: (800) 424-LEAD

EPA's Safe Drinking Water Hotline: (800) 426-4791

Drinking Water Best Management Practices for Schools and Childcare Facilities Served by Municipal Water Systems (EPA)
Provides basic information for decision-makers as well as best management practices.

State Drinking Water and Lead Prevention Information Sources

State drinking water programs can describe state-specific requirements and provide additional guidance materials for schools. For a complete list of State Drinking Water program contacts and lead prevention information sources, see:

Implementing the Lead Public Education Provision of the Lead and Copper Rule for Non Transient, Non Community Water Systems, Appendix C:

http://water.epa.gov/lawsregs/rulesregs/sdwa/lcr/upload/Implementing-the-Lead-Public-Education-Provisions-of-the-Lead-and-Copper-Rule-A-Guide-for-Non-Transient-Non-Community-Water-Systems.pdf

Implementing the Lead Public Education Provision of the Lead and Copper Rule for Community Water Systems, Appendix C:
http://water.epa.gov/lawsregs/rulesregs/sdwa/lcr/upload/Implementing-the-Lead-Public-Education-Provisions-of-the-Lead-and-Copper-Rule-A-Guide-for-Community-Water-Systems.pdf

Glossary

Acidic:
The condition of water or soil which contains a sufficient amount of acidic substances to lower the pH below 7.0.

Action Level:
The level of lead or copper which, if exceeded, triggers treatment or other requirements that a water system must follow.

Alkalinity:
The capacity of water to neutralize acids. This capacity is caused by the water's content of carbonate, bicarbonate, hydroxide and occasionally borate, silicate and phosphate. Alkalinity is expressed in milligrams per liter of equivalent calcium carbonate. Alkalinity is not the same as pH because water does not have to be strongly basic (high pH) to have a high alkalinity. Alkalinity is a measure of how much acid can be added to a liquid without causing a significant change in pH.

Alloy:
A solution made of two or more elements, at least one of which is a metal.

Backflow:
A reverse flow condition created by a difference in water pressures which causes water to flow back into the distribution pipes of a potable water supply from any source or sources other than an intended source.

Backwashing:
The process of reversing the flow of water back through the filter media to remove the entrapped solids.

Bacteria:
Microscopic living organisms usually consisting of a single cell. Bacteria can aid in pollution control by consuming or breaking down organic matter in sewage or by similarly acting on oil spills or other water pollutants. Some bacteria in soil, water or air may also cause human, animal and plant health problems.

Compliance:
The act of meeting all state and federal drinking water regulations.

Contaminant:
Anything found in water (e.g., microorganisms, minerals, chemicals, radionuclides, etc.) which may be harmful to human health.

Corrosion:
The gradual decomposition or destruction of a material by chemical action often due to an electrochemical reaction. Corrosion may be caused by: 1) stray current electrolysis, 2) galvanic corrosion caused by dissimilar metals or 3) differential concentration cells. Corrosion starts at the surface of a material and moves inward.

Corrosivity:
A condition of water quality which will dissolve metals at an excessive rate. The factors that make water corrosive include an acidic pH, low alkalinity, high dissolved solids and higher temperature.

Cross Connection:

Any actual or potential connection between a drinking (potable) water system and an unapproved water supply or other source of contamination. For example, if you have a pump moving non-potable water and hook into the ground water system to supply water for the pump seal a cross-connection or mixing between the two water systems can occur. This mixing may lead to contamination of the drinking water.

Descaler:

A solution used to remove and/or prevent limescale and fouling on water taps, kettles, coffeemakers, toilets and water pipes.

Disinfectant:

A chemical (commonly chlorine, chloramine or ozone) or physical process (e.g., ultraviolet light) that kills microorganisms such as bacteria, viruses and protozoa.

Distribution System:

A network of pipes leading from a treatment plant to customers' plumbing systems or the pipes and plumbing within a building that distribute water to all of the water outlets.

Ground Water:

The water that systems pump and treat from aquifers (natural reservoirs below the earth's surface).

Lead Service Line:

A service line made of lead which connects the water main to the building inlet and any lead pigtail, gooseneck or other fitting which is connected to such a lead line.

Monitoring Program:

Testing that water systems must perform to detect and measure contaminants. Specifically, measuring concentrations of certain substances within environmental media (e.g., drinking water) at regularly scheduled intervals.

Municipal Water System:

A network of pipes, pumps and storage and treatment facilities designed to deliver potable water to homes, schools, businesses and other users in a city or town.

Non-Potable Water:

Water that may contain objectionable pollution, contamination, minerals or infective agents and is considered unsafe and/or unpalatable for drinking.

Pathogen:

A disease-causing organism.

pH:

A measurement of how acidic or basic a substance is. It ranges from 0 to 14. A pH of 7 is neutral. A pH less than 7 is acidic, and a pH greater than 7 is basic.

Point-of-Entry Device:

A treatment device applied to the drinking water entering a house or building for the purpose of reducing contaminants in the drinking water distributed throughout the house or building.

Point-of-Use Device:

A treatment device applied to a single tap used for the purpose of reducing contaminants in drinking water at that one tap.

Potable Water:

Water that is safe and satisfactory for drinking and cooking.

Public Water System:

A system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least 15 service connections or regularly serves at least 25 individuals.

Remediation:
Removal of pollution or contaminants from environmental media such as soil, ground water, sediment or surface water for the general protection of human health and the environment.

Samples:
The water that is analyzed for the presence of EPA-regulated drinking water contaminants. Depending on the regulation, EPA requires water systems and states to take samples from source water, from water leaving the treatment facility or from the taps of selected consumers.

Soft Water:
Water having a low concentration of polyvalent cations, such as calcium and magnesium ions. According to U.S. Geological Survey guidelines, soft water is water having a hardness (concentration of polyvalent cations) of 60 milligrams per liter or less.

Solder:
A metallic compound used to seal the joints between pipes. Until recently, most solder contained 50% lead. The use of lead solder containing more than 0.2% lead is now prohibited for pipes carrying potable water.

Source Water:
Water in its natural state prior to any treatment for drinking.

Toilet Dam:
A water-conservation device that is placed inside the tank portion of a toilet to reduce the amount of water the tank will hold by partitioning off part of the tank.

ATTACHMENT

11

California DEPARTMENT OF EDUCATION

California Department of Education
Official Letter

June 17, 2016

Dear County and District Superintendents and Charter School Administrators:

CLEAN WATER

I encourage all California schools to consider testing water quality and replace drinking fountains and faucets when necessary.

All students should have access to clean drinking water at all times. Students need fresh water, nutritious meals, and appropriate physical activity to be ready to learn in class.

A May 5, 2016, report by the Community Water Center and the Environmental Justice Coalition for Water noted that some school districts received water from water districts and other sources that, at times, did not meet primary drinking water standards.

The California Department of Education and individual school districts do not maintain records of water suppliers to schools because state and federal law assign that responsibility to water providers. Nonetheless, school districts should know about existing resources that are available to assure water quality. The Association of California Water Agencies provides extensive information about water quality at http://www.acwa.com/content/water-quality/water-quality.

When your school district is upgrading or replacing drinking fountains or other water equipment, contact your local water provider to see if they offer free or reduced-price testing. Water quality reports are also available from your water provider.

The lead content in the drinking water crisis in Flint, Michigan might raise concerns here in California. California's water agencies regularly test for lead in their systems and at the tap to comply with both state and federal laws. Water agencies also actively utilize corrosion control measures to prevent any lead that might be present from leaching into tap water.

California reduced the lead content standard for drinking water plumbing from 4 to 0.25 percent in 2010 with "No Lead Law" legislation (AB 1953), effective in 2010.

All schools can work with their local water service to make sure students have access to clean water. Thank you for your attention to this important issue.

Sincerely,

Tom Torlakson

TT:ro
2016-04724

Last Reviewed: Tuesday, June 21, 2016

ATTACHMENT

12

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board
Division of Drinking Water

TO: All Community and Nontransient Noncommunity Water Systems

FROM: Cindy Forbes, P.E.
Deputy Director
DIVISION OF DRINKING WATER

DATE: March 7, 2016

SUBJECT: RECOMMENDATIONS FOR ENHANCED PUBLIC ACCESS TO LEAD AND COPPER RULE RELATED INFORMATION

As you are aware, there has been considerable attention in recent months regarding the lead levels found in the drinking water supply serving consumers living and working in the Flint, Michigan area. Although the 90th percentile tap samples lead action level is rarely exceeded by California public water systems, some of the individual tap samples have exceeded the action level.

To maintain high confidence in the drinking water that you are providing to your customers, the State Water Resources Control Board, Division of Drinking Water (DDW) is recommending to all public water systems that are subject to the Lead and Copper Rule (LCR) to enhance their public outreach efforts on and the availability of LCR compliance-related information. This outreach may include the posting of the following information on the water systems' websites or physically posting the information alongside other water quality notices, such as the Annual Consumer Confidence Report. Our recommendation is for public water systems to make available to the public the following:

- The latest 90th percentile values for the most recent round of LCR tap sampling; and
- The number of sites sampled, the number of sites that exceeded an action level, and the number of samples that were invalidated (if applicable); and
- Justifications for invalidation of LCR samples (if applicable); and
- Information on the locations of lead service lines in the distribution system, together with a map of the identified areas and an inventory of lead plumbing in the system; and
- Additional health information on how to minimize lead in drinking water if lead was detected above the action level in more than 5%, and up to and including 10% , of sites sampled. The health information language specified in Section 64482(c), Chapter 15, Title 22 of the Consumer Confidence Report regulations may be used for this purpose.

As a reminder, please ensure residents that participated in the lead and copper tap sampling promptly receive the sampling results for their homes and provide additional assistance if lead is detected in the water sample. It is recommended that you provide the monitoring results to the residents no later than 30 days after you receive the monitoring results from your laboratory and within 1-2 working days if lead and/or copper levels over the respective action levels are found.

DDW is working closely with the U.S. Environmental Protection Agency (USEPA) to ensure California's water systems are in compliance with the requirements of the Lead and Copper Rule and taking necessary actions to protect public health. The USEPA will be working on revising and strengthening the Lead and Copper Rule. DDW will keep you abreast of any upcoming changes. The latest information will be available on the DDW's website:
http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/leadandcopperrule.shtml

If you have further questions regarding this matter, please contact your local District Engineer or county health department.

ATTACHMENT

13

PUBLIC HEALTH GOALS FOR CHEMICALS IN DRINKING WATER

LEAD

April 2009

Governor of the State of California
Arnold Schwarzenegger

Secretary for Environmental Protection
California Environmental Protection Agency
Linda Adams

Director
Office of Environmental Health Hazard Assessment
Joan E. Denton, Ph.D.

Public Health Goal for Lead in Drinking Water

Prepared by

Pesticide and Environmental Toxicology Branch
Office of Environmental Health Hazard Assessment
California Environmental Protection Agency

April 2009

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PREFACE

Drinking Water Public Health Goals
Pesticide and Environmental Toxicology Branch
Office of Environmental Health Hazard Assessment
California Environmental Protection Agency

This Public Health Goal (PHG) technical support document provides information on health effects from contaminants in drinking water. PHGs are developed for chemical contaminants based on the best available toxicological data in the scientific literature. These documents and the analyses contained in them provide estimates of the levels of contaminants in drinking water that would pose no significant health risk to individuals consuming the water on a daily basis over a lifetime.

The California Safe Drinking Water Act of 1996 (Health and Safety Code, Section 116365) requires the Office of Environmental Health Hazard Assessment (OEHHA) to perform risk assessments and adopt PHGs for contaminants in drinking water based exclusively on public health considerations. The Act requires that PHGs be set in accordance with the following criteria:

1. PHGs for acutely toxic substances shall be set at levels at which no known or anticipated adverse effects on health will occur, with an adequate margin of safety.
2. PHGs for carcinogens or other substances that may cause chronic disease shall be based solely on health effects and shall be set at levels that OEHHA has determined do not pose any significant risk to health.
3. To the extent the information is available, OEHHA shall consider possible synergistic effects resulting from exposure to two or more contaminants.
4. OEHHA shall consider potential adverse effects on members of subgroups that comprise a meaningful proportion of the population, including but not limited to infants, children, pregnant women, the elderly, and individuals with a history of serious illness.
5. OEHHA shall consider the contaminant exposure and body burden levels that alter physiological function or structure in a manner that may significantly increase the risk of illness.
6. OEHHA shall consider additive effects of exposure to contaminants in media other than drinking water, including food and air, and the resulting body burden.
7. In risk assessments that involve infants and children, OEHHA shall specifically assess exposure patterns, special susceptibility, multiple contaminants with toxic mechanisms in common, and the interactions of such contaminants.
8. In cases of insufficient data for OEHHA to determine a level that creates no significant risk, OEHHA shall set the PHG at a level that is protective of public health with an adequate margin of safety.

9. In cases where scientific evidence demonstrates that a safe dose response threshold for a contaminant exists, then the PHG should be set at that threshold.

10. The PHG may be set at zero if necessary to satisfy the requirements listed above in items seven and eight.

11. PHGs adopted by OEHHA shall be reviewed at least once every five years and revised as necessary based on the availability of new scientific data.

PHGs adopted by OEHHA are for use by the California Department of Public Health (DPH) in establishing primary drinking water standards (State Maximum Contaminant Levels, or MCLs). Whereas PHGs are to be based solely on scientific and public health considerations without regard to economic cost considerations or technical feasibility, drinking water standards adopted by DPH are to consider economic factors and technical feasibility. Each primary drinking water standard adopted by DPH shall be set at a level that is as close as feasible to the corresponding PHG, placing emphasis on the protection of public health. PHGs established by OEHHA are not regulatory in nature and represent only non-mandatory goals. By state and federal law, MCLs established by DPH must be at least as stringent as the federal MCL, if one exists.

PHG documents are used to provide technical assistance to DPH and they are also informative reference materials for federal, state and local public health officials and the public. While the PHGs are calculated for single chemicals only, they may, if the information is available, address hazards associated with the interactions of contaminants in mixtures. Further, PHGs are derived for drinking water only and are not intended to be utilized as target levels for the contamination of other environmental media.

Additional information on PHGs can be obtained at the OEHHA Web site at www.oehha.ca.gov.

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PUBLIC HEALTH GOAL FOR LEAD IN DRINKING WATER

SUMMARY

A revised Public Health Goal (PHG) of 0.2 ppb (or 0.2 μg/L) for lead in drinking water is established, on the basis of new studies relating neurobehavioral deficits to lower lead concentrations in the blood than previously reported. The existing PHG of 2 ppb for lead in drinking water was developed by the Office of Environmental Health Hazard Assessment (OEHHA) and published in December 1997. This value was also based on neurobehavioral effects of lead in children.

Lead is a metallic element which has been used primarily in piping, paints, cable coverings, bullets, radiation shielding material, and as a gasoline additive (tetraethyl lead). It is a widespread contaminant in the human environment and occurs in drinking water as a consequence of leaching from plumbing containing lead. Lead was reported as found in 1,481/11,471 drinking water sources in California in the Department of Health Services (now Department of Public Health) survey results for 1984-2001. Lead has multiple toxic effects on the human body. In particular, decreased intelligence in children and increased blood pressure in adults are among the more serious non-carcinogenic effects. Lead is also a carcinogen in animals and is a probable carcinogen in humans. Based on studies correlating blood lead levels with decreased IQ in children, a daily oral intake of 28.6 μg/day was used to derive the PHG in 1997. A no observed adverse effect level (NOAEL) was not found for this effect. The health-protective level for cancer (6 ppb) was not used to determine the PHG as the non-cancer value provided a greater level of health protection.

In the current document, OEHHA has completed an extensive review of the literature since publication of the first PHG (OEHHA, 1997a). The focus of this review was on new data regarding the potential carcinogenicity, neurotoxicity, and mechanism of action of lead. Based on the new studies relating neurobehavioral deficits to lower blood lead concentrations than previously reported, we established a PHG that is lower than the previous one by 10-fold. The calculation uses a lower level of concern of 2.86 μg/day, which is primarily based on the review and slope factor work done by Carlisle and Dowling (2006) and their analysis of Lanphear *et al*. (2005) (OEHHA, 2007), using a relative source contribution of 0.2, an uncertainty factor of 3 and a drinking water consumption rate of 1 L/day.

Both the U.S. Environmental Protection Agency (U.S. EPA) and California Department of Public Health (DPH) have an Action Level of 15 ppb lead in drinking water. This Action Level was established in 1991 by the U.S. EPA and in 1995 in California.

INTRODUCTION

The purpose of this document is to review and evaluate the new data since 1997 regarding the toxicity of lead that are relevant to the estimation of a public health-protective level in drinking water, and establish any necessary changes in the previous risk assessment based on the new findings. This document is centered on updating the earlier OEHHA assessments for drinking water (OEHHA, 1997a, 2007). Lead is a widespread contaminant in the human environment and occurs in drinking water. Pipes and solder made with lead may corrode and leach lead into tap water used for drinking, food preparation, and other household uses. Lead has toxic effects on many systems of the body, particularly on the developing nervous system, the hematological and cardiovascular systems, and the kidney.

CHEMICAL PROFILE

Chemical Identity, Properties, and Uses

Lead is a bluish gray or gray-white metal with a bright silvery luster. It is soft, malleable and a poor conductor of electricity, but is resistant to corrosion (ATSDR, 2007). Lead is a metallic element, the 82nd element on the periodic table, with four stable isotopes (i.e., 204, 206, 207, and 208) and exists in three oxidation states [Pb(0), Pb(II), and Pb(IV)]. Small amounts of lead are produced by the decay of heavier radioactive elements, both natural and synthetic (ATSDR, 2007).

The melting point of metallic lead is 327.4°C; its boiling point is 1,740°C. The density of metallic lead is 11.34 g/cm^3 at 20°C. Metallic lead is soluble in nitric or sulfuric acid, but insoluble in water or organic solvents. Lead salts such as lead nitrate and lead acetate are soluble in water. The usual valence states of lead are 0, +2 and +4. Lead can easily be alloyed with antimony, tin or other metals. Common lead salts include: acetate, chloride, chromate, nitrate, oxide, phosphate and sulfate. Lead can also be part of organic compounds, and can be chelated by various ligands (ATSDR, 2007).

Lead is easily obtained from its most common ore, galena (PbS). The many commercial uses of lead follow from the physical and chemical properties described above. Lead has been used in piping, roofing and other structural uses because of the malleability (ATSDR, 2007). Lead is also used in making containers for corrosive liquids (ATSDR, 2007). Metallic lead and lead dioxide are used in storage batteries for automobiles and other applications (ATSDR, 2007). In the past, organolead compounds were used to boost octane (reduce knock) in gasoline, but this use has now been eliminated for car, truck, and boat fuel in the U.S. Lead and lead salts have been widely used in paints and pigments, and in glazes for ceramics. Cable coverings have been made from lead because of its electrical resistance and ductility. Lead is used to make bullets and shot. Because of its low melting point, lead is used (with other metals) to make solder. Lead is used for radiation shielding around diagnostic x-ray machines and other sources of radiation (ATSDR, 2007). In the past lead was included in a number of medicines such as antiseptics and astringents, but these are no longer recommended because of the cumulative toxic effects of lead in the body. More recently, lead has been found in Mexican candy (U.S. FDA, 2004) sold throughout the United States. Overall, approximately 1.6 million metric tons of lead were used in the United States in 1997 (Smith, 1998).

ENVIRONMENTAL OCCURRENCE

Lead is widely distributed in the environment. It is found in all media including air, water, food and soil.

Air

Lead levels in the ambient air have been monitored and atmospheric lead concentrations vary widely. Smelters and refineries emit lead into the air; automobiles in the past emitted large quantities from use of leading gasoline. Over the past three decades, the amount of lead in the air has been greatly reduced by the introduction of unleaded gasoline (ATSDR, 2007). For example, lead at all sites monitored by the National Park Service and U.S. EPA in 1986 had a sharp decrease (18 percent) from the mean levels of 1982 (Eldred and Cahill, 1994). Across the United States, a decline of 97 percent in the ambient concentration of lead was reported between 1976 and 1995 (ATSDR, 2007). Although lead ambient concentrations have declined, U.S. EPA (1996a) indicates that the rate of decline has slowed. The national average of lead concentrations remained unchanged at 0.004 $\mu g/m^3$ between 1994 and 1995. The average level of lead in ambient air in California has been reported as 0.04 to 0.06 $\mu g/m^3$, mostly in particulate form (OEHHA, 1997b).

In general, lead concentrations are 0.3-0.8 times lower indoors than outdoors, with an average ratio of 0.5 (U.S. EPA, 1986). The median lead concentration outdoors was 8.84 ng/m^3 in 2002 (Bonanno *et al*., 2002). Bonanno *et al*. (2001) earlier reported a mean and median lead concentration for indoor air from 213 residences as 15.2 ng/m^3 and 6.17 ng/m^3, respectively. Lead concentrations are higher in homes where one or more residents smoke indoors or where the home is more dilapidated.

Lead in contaminated soil can also become airborne when soil particles are picked up by the wind, or when soil is disturbed by digging, grading, plowing or gardening.

Soil

Contamination of soil by lead is widespread in California and elsewhere. Lead has been deposited in soil in a number of ways: atmospheric particulates from the emission of smelters or at one time, the combustion of leaded gasoline; lead paint deposited in soil, particularly around older homes; disposal of lead storage batteries. Some lead storage battery disposal sites have very high levels of lead contamination, up to a few percent of the soil.

A national survey of soil lead in the United States (U.S.) found levels ranging from 10 to 700 ppm, with an average of about 15 ppm (Shacklette *et al.*, 1971). Fifteen parts per million has also been given as the average naturally occurring soil lead level (Lovering, 1976). Lead concentrations in California soils analyzed by Bradford *et al*. (1996) ranged from 12 to 97 mg/kg (or ppm).

Water

Levels of lead in surface water and groundwater throughout the United States typically range between 5 and 30 μg/L or ppb (U.S. EPA, 1986). The concentration of lead is dependent upon sources of pollution, lead content of sediments, and characteristics of the system (pH, temperature). In drinking water, the major source of lead is leaching from the plumbing and solder. Lead enters drinking water from lead in pipes and fixtures and from lead solder used to join pipes (Mahaffey, 1985). This is particularly troublesome in older homes. Older public buildings such as schools and theaters may also have problems with lead contamination of drinking water (Mahaffey, 1985). U.S. EPA (1988) estimated that 99 percent of the U.S. population using public water supplies were exposed to drinking water with levels of lead below 5 ppb and that about 2 million people are served by drinking water with levels of lead above 5 ppb. In California, analysis of over 15,000 drinking water and 1000 surface water sources found no sources with reportable levels of lead (greater than 5 ppb) between 1994 and 2004.

METABOLISM, PHARMACOKINETICS, AND MECHANISM OF ACTION

Inorganic lead can be absorbed following oral and inhalation exposure, with minimal absorption following dermal exposure. When lead is ingested from drinking water or foods, a fraction of it is absorbed into the bloodstream via the gastrointestinal tract. Lead in the bloodstream becomes deposited in tissues, mainly in bone. Blood lead is excreted via the feces and urine, but also is lost during childbirth and breastfeeding. Once absorbed, lead can cause hematological, cardiovascular, renal, and neurobehavioral effects via several mechanisms: mimicking calcium, interference with specific neurotransmitter systems, direct effect on vascular smooth muscle and enzymes, and other pathways.

Absorption

Absorption of lead deposited in the lungs is dependent on particle size, age-related factors that determine breathing patterns, airway geometry, and air-stream velocity within the respiratory tract (ATSDR, 2007). Particles below 1 μm are deposited in the alveolar region and absorbed after extracellular dissolution or ingestion by phagocytic cells. For larger particles (>2.5 μm), deposition is usually in ciliated airways, where particles can be transported to esophagus and swallowed. Approximately 95 percent of deposited inorganic lead (<1 μm size particles) that is inhaled will be absorbed, while absorption rates for the larger particles are determined by rates of transport to and absorption from the gastrointestinal tract (ATSDR, 2007).

Oral ingestion also results in good absorption of lead and lead compounds. The rate is highly influenced by the physiological state of the exposed individual (e.g., fasting, pregnancy, age, nutrition) and physicochemical properties of the ingested material (e.g., particle size, mineralogy, and solubility) (ATSDR, 2007). For dermal absorption, inorganic lead was the least absorbed while organic compounds such as tetraethyl lead and lead naphthenate had a greater absorption across human skin or *in vivo* in rats (Bress and Bidanset, 1991; ATSDR, 2007). Absorption ranged from 0.002 percent of the applied concentration for inorganic lead to 0.17 percent for lead naphthenate (ATSDR, 2007).

Absorption of water-soluble lead following oral exposure appears to be greater in children than in adults. Children (2 weeks to 2 years of age) absorb about 40 to 50 percent of ingested lead, whereas adults absorb only 5 to 15 percent (Heard and Chamberlain, 1982; Ragan, 1983). Absorption of lead into the blood from the gastrointestinal tract appears to be low in humans compared to animals, although it is higher in children than in adults (Ragan, 1983). A similar pattern is observed in animal studies. Rat pups were reported to absorb 40-50 times more lead via the diet than adult animals (ATSDR, 2007). The difference in absorption may be one reason why children are more sensitive than adults to lead exposure by the oral route.

Blood lead concentrations have dropped in the last three decades from an average U.S. national level of 12.8 μg/dL (ages 1 to 74) to 2.8 μg/dL (ATSDR, 2007). Prevalence of children aged 1-5 years with a blood lead concentration of $\geq$ 10 μg/dL also dropped with time. In 1991 to1994, the prevalence was 4.4 percent with a geometric mean of 2.7 μg/dL while in 1999-2002 the prevalence was 1.6 percent with a geometric mean of 1.9 μg/dL (ATSDR, 2007).

Distribution

Once lead is absorbed, the distribution of lead is essentially the same regardless of route of exposure or age of individual (ATSDR, 2007). The lead which is not eliminated in the urine or feces is distributed into the tissues of the body including the bone, brain and kidneys (Rabinowitz, 1991). However, a larger fraction of the lead body burden of adults resides in bone (93 percent) compared to children (73 percent) (ATSDR, 2007). The relatively large pool of lead in the bone can serve to maintain blood lead levels long after exposure has ended (Inskip *et al*., 1996; Smith *et al*., 1996; Fleming *et al*., 1997). The storage of lead in bone depends on the diet; higher levels of calcium and iron in the diet tend to protect against deposition of lead into the bone (Rabinowitz, 1991; Silbergeld, 1991). Lead accumulates in the bone with time, and lead levels in the bone generally increase with age (Rabinowitz, 1991).

Lead also distributes to soft tissues (i.e., liver, skeletal muscle, skin, fat, kidney, lung, aorta, and brain). The highest soft tissue concentration of lead in adults occurs in liver and kidney cortex. The residence time of lead in the soft tissues (brain and kidneys) is much shorter than in the bone. High blood lead levels may indicate recent exposure, or in some cases they may reflect remobilization of lead from bone storage (Silbergeld, 1991). During pregnancy, lead is often remobilized from bone and may be transferred from mother to fetus (Silbergeld, 1991). Approximately 80 percent of lead in fetal cord blood appears to derive from maternal bone stores (Gulson *et al*., 2003). Maternal lead can also be transferred to infants during breastfeeding. Thus the developing fetus and young child will be exposed early. Graziano *et al*. (1990) reported a cord/maternal ratio to be relatively constant at 0.93 in 888 mother-infant pairs evaluated over a maternal blood lead range of 3-40 μg/dL.

Metabolism

The formation of complexes with a variety of protein (e.g., albumin or ALAD) and non-protein ligands (e.g., non-protein sulfhydryls) are observed in the metabolism of inorganic lead (ATSDR, 2007). For the organic lead compounds, metabolism is primarily by oxidative dealkylation catalyzed by cytochrome P-450 in the liver. For example, tetraethyl lead is excreted in the urine as diethyl lead, ethyl lead, and inorganic lead (Turlakiewicz and Chmielnicka, 1985; Zhang *et al*., 1994; Vural and Duydu, 1995).

Excretion

Independent of route of exposure, absorbed lead is excreted mainly through the urine and feces, but also in the bile, sweat, hair, fingernails and breast milk (Rabinowitz, 1991; ATSDR, 2007). Chamberlain *et al*. (1978) reported that approximately one-third of total excretion of absorbed lead occurs through the feces.

Pharmacokinetics

Physiologically based pharmacokinetic (PBPK) models are biologically and mechanistically based and can be used to extrapolate the pharmacokinetic behavior of chemical substances from high to low dose, from route to route, between species, and between subpopulations within a species (ATSDR, 2007). These models are increasingly used in risk assessments in order to predict the target tissue dose of chemicals in humans who are exposed to environmental levels. Several pharmacokinetic models have been proposed for a broad application in lead risk assessment.

The latest models being considered incorporated some of the earlier work done by Rabinowitz *et al*. (1976) and Marcus (1985a,b,c). The Rabinowitz *et al*. (1976) model included a central compartment representing blood and other tissues in rapid equilibrium with blood, a shallow tissue compartment representing soft tissues and rapidly exchanging pools within the skeleton, and a deep tissue compartment representing slow exchanging pools of lead within bone. This model predicted pseudo-first order half-times for lead of approximately 25, 28, and 10,000 days in the central, shallow, and deep compartments, respectively. Marcus (1985a,b,c) expanded the model by adding more compartments after reanalyzing the data used by Rabinowitz *et al*. (1976). The Marcus model 1) included separate compartments for cortical bone (slow kinetics) and trabecular bone (fast kinetics); 2) had a more complex representation of lead deposition in bone; and

3) used nonlinear kinetics in the exchange of lead among plasma, protein-bound lead in plasma, a “fast kinetic” erythrocyte pool, and a “slow kinetic” erythrocyte pool. A curvilinear relationship between plasma and blood lead concentrations observed in humans was predicted with this model (ATSDR, 2007).

The more recent models being used or considered in the lead risk assessment are those developed by O’Flaherty (1993, 1995), U.S. EPA (1994a,b), and Leggett (1993). The O’Flaherty model, which simulates lead kinetics from birth through adulthood, relies more extensively on physiologically based parameters to describe volumes, flows, and composition, and metabolic activity of blood and bone. The other two models are more classical multi-compartmental models that use values of the age-specific transfer rate constants for lead based on kinetic data obtained from animal/human studies, and may not have precise physiological correlates. The Leggett model is also a lifetime model (infant to adult lead kinetics) like the O’Flaherty model. However, the U.S. EPA Integrated Exposure Uptake BioKinetic (IEUBK) model is not intended for use in predicting lead pharmacokinetics in adults. This model provides blood lead concentration distributions in populations of children ages 0-7 years (U.S. EPA, 1994a,b).

All three models provide an assessment of lead exposure and blood lead concentration, and represent the rate of uptake of lead as relatively simple functions of lead intake; the values/variables assigned in the calculation are age-specific or even environmental medium-specific (ATSDR, 2007). In addition, the three models were calibrated using physiological data from humans and animals, and blood lead concentrations reported for individuals and/or populations. The focus on the use of blood lead concentrations derives from the observations that high blood lead concentrations have been associated with various dysfunctions or health effects. Also, the most available data for calibrating and validating a model are the data relating exposure and/or lead intake to blood concentration.

Although the three models can predict a blood lead concentration, differences do exist in the representation of lead exposure, exchanges of lead between tissues, and how tissues are represented. Some of the differences are due to assumptions used for lead biokinetics and bioavailability (ATSDR, 2007). Predicted blood lead concentration can be up to 2 to 4 fold different depending on the model used and the age being considered. Smaller changes are predicted in blood lead concentration in adults with the O’Flaherty and Leggett Models due to the lower lead bioavailability used for adults compared to children.

Simpler alternatives to pharmacokinetic models to obtain medium-specific exposures and blood lead concentrations are the slope factor models. These models predict blood lead concentration or the change in blood lead concentration that is associated with a given exposure using a simple linear relationship between blood lead concentration and either lead uptake (biokinetic slope factor) or lead intake (intake slope factor) (Carlisle and Wade, 1992; Bowers *et al*., 1994; Stern, 1994, 1996; U.S. EPA, 1996b; Abadin *et al*., 1997). The models that use the biokinetic slope factor will include an absorption parameter to account for absorption. The models that use intake slope factors integrate both absorption and biokinetics into a single slope factor because they are based on ingested lead rather than absorbed lead (ATSDR, 2007). Also, the intake slope factor models are derived from epidemiologic observations. Carlisle and Dowling (2006) recently used a slope factor model with the review of several datasets for the development of a reference blood concentration for school and preschool children of 1.2 μg/dL lead. The calculated slope, based on Lanphear *et al*. (2000, 2005), Canfield *et al*. (2003), and Emory *et al*. (2003), was a drop of 1 Intelligence Quotient (IQ) point for each 1.2 μg/dL increase in lead concentration. This work has been incorporated into the OEHHA report, "Development of health criteria for school site risk assessment pursuant to Health and Safety Code Section 901(g): Child-specific benchmark change in blood lead concentration for school site risk assessment" (OEHHA, 2007). The slope provided in the children's reference concentration document is 1 IQ point drop for each 1 μg/dL increase in blood lead.

Mechanism of Action

Multiple potential mechanisms of action exist for lead that affect many enzyme systems and cellular processes throughout the body (ATSDR, 2007). The main areas of focus in this document are on the major concerns for lead toxicity: neurotoxicity, cardiovascular/renal toxicity, and hematological toxicity. The most abundant amount of research is in the area of mechanism for neurological effects. However, research into the remaining areas of concern has also been abundant.

Cardiovascular Effects

For cardiovascular changes, lead affects important hormonal and neural systems that contribute to the regulation of peripheral vascular resistance, heart rate, and cardiac output (Carmignani *et al*., 2000; Vaziri and Sica, 2004). Lead can have a direct effect on vascular smooth muscle by inhibiting Na-K-ATPase activity, with an associated elevation of intracellular calcium levels (Watts *et al*., 1995; Hwang *et al*., 2001). Lead-induced hypertension in rats was associated with depletion of nitric oxide, which is involved in 1) regulating blood pressure; 2) down-regulation of the soluble guanylate cyclase enzyme which forms cyclic guanosine monophosphate (a mediator of nitric oxide-induced vasodilation); and 3) changes in the adrenergic system (i.e., increased central sympathetic nervous system activity, elevated plasma norepinephrine, and decreased vascular β-adrenergic receptor density) (Gonick *et al*., 1997; Vaziri *et al*., 1997, 1999a,b; Carmignani *et al*., 2000; Tsao *et al*., 2000; Vaziri and Sica, 2004; ATSDR, 2007). Chronic lead exposure stimulates the sympathetic nervous system, which results in the activation of the renin-angiotensin-aldosterone system (Carmignani *et al*., 1988). Alterations in the regulation of the kallikrein-kinin system and the production of associated vasodilatory hormones are also associated with lead-induced hypertension (Carmignani *et al*., 1999).

Renal Effects

Oxidative stress appears to be involved in the development of renal toxicity. As reported by Carmignani *et al*. (2000), Gonick *et al*. (1997), and Vaziri *et al*. (1997, 1999a,b), depletion of nitric oxide can contribute to hypertension in the rat and this can result in impairment of glomerular filtration and in lesions of the glomerulus. Intranuclear inclusion bodies are observed in the renal proximal tubules of lead-exposed animals, as a result of formation of a lead-protein complex (ATSDR, 2007). The mechanism for the formation of the protein-lead complex still remains unknown.

Hematological Effects

Hematological effects have been demonstrated in humans and animals following exposure to lead. The effects include increased levels of urinary porphyrins, coproporphyrins, δ-aminolevulinic acid, zinc proporphyrin, and erythrocyte protoporphyrin. These changes are the result of the alteration of three enzymes involved in heme biosynthesis: δ-aminolevulinic acid synthetase, δ-aminolevulinic dehydrase, and ferrochelatase (ATSDR, 2007). Associated with these changes is a reduction of the hemoglobin concentration in blood.

Neurobehavioral Effects

A brief summary of the key areas regarding the potential neurotoxicity mechanism of action is provided for lead. The reader is referred to the more recent literature reviews (Carpenter *et al*., 1994; Banks *et al*., 1997; Bressler *et al*., 1999; Gilbert, 1999a,b; Cory-Slechta 1995, 2003; Bouton and Pevsner, 2000; Zawia *et al*., 2000; Lasley and Gilbert, 2000, 2002; Nihei and Guilarte, 2002; Suszkiw, 2004; ATSDR, 2007) and references cited within for more detailed information. The key mechanisms for neurological effects are postulated to be: 1) mimicking of calcium action and/or disruption of calcium homeostasis (e.g., interactions with protein kinase C or calmodulin); 2) substitution for zinc in some enzymes and zinc-finger domains found in enzymes, channels, and receptors; and 3) interference with specific neurotransmitter systems in the brain (i.e., glutamatergic, dopaminergic, and cholinergic systems).

Because lead mimics calcium action and/or disrupts calcium homeostasis, many cellular neurological processes regulated by protein kinase C (several forms of which are calcium-dependent) or calmodulin can be affected by lead. For example, protein kinase C (PKC) is involved in the synthesis of neurotransmitters, ligand-receptor interactions, conductance of ionic channels, and dendritic branching. One of the several calcium-dependent forms of PKC, the γ-isoform, is neuron-specific and involved in long-term potentiation (LTP), spatial learning, and memory processes (ATSDR, 2007). By disrupting or mimicking the calcium action, lead can have an affect on all of these processes. Activation of PKC also tends to change the blood brain barrier. Immature brain microvessels will contain most of the PKC in the cytosol while in mature brain the PKC is membrane-bound. Upon activation of PKC, the distribution of PKC changes from cytosol to membrane. A similar response is observed in the immature brain microvessels following exposure to lead. The effect on the microvascular formation and function may account for the gross defects observed in the blood brain barrier (e.g., penetration of albumin, ions, and water) and result in edema and intracranial pressure.

Substitution of lead for zinc can result in alteration of the binding and transcription of the regulated protein to its specific DNA sequence. For example, lead alters the binding of the zinc-finger transcriptional regulator Sp1 to the DNA binding site. Sp1 regulates the myelin basic protein, proteolipid protein, and β-amyloid precursor protein genes. Many of the zinc-finger domains can be found in enzymes, channels, and receptors, which accounts for the multiple responses following lead exposure.

The third major path for neurotoxicity is interference with specific neurotransmitter systems in the brain (i.e., glutamatergic, dopaminergic, cholinergic, and other systems) (ATSDR, 2007). In the most studied system, the glutamatergic system, lead is purported to diminish LTP, which is important in memory consolidation, by increasing the threshold for inductions, reducing the magnitude of potentiation, and shortening the duration of LTP by accelerating its rate of decay. The end result is loss of the neurophysiological substrate for learning and storing information. LTP is more sensitive to injury during early development and such exposure can result in an impaired LTP in adult animals. Lead is also purported to impair regulation of dopamine synthesis and release, which results in cognitive dysfunction. Learning and memory processes can also be affected by lead when lead blocks evoked release of acetylcholine and diminishes cholinergic function.

TOXICOLOGY

The document focuses on the non-carcinogenic effects of lead and the health effects observed in the most sensitive population, i.e., children and neonates. The primary effect observed in children or neonates is the neurobehavioral deficits that occur at low blood lead concentrations. For the general population, exposure to lead occurs primarily via the oral route whereas occupational exposure is primarily by inhalation. The toxicological data will not be separated out by route of exposure because the toxicity of lead is the same regardless of route of entry into the body. Articles that are relevant to the understanding of lead toxicity will be summarized below. A discussion is also provided on the carcinogenicity of lead, which is determined to be a less sensitive endpoint than the neurobehavioral deficits in children or neonates, based on our evaluation for the development of the lead PHG.

Toxicological Effects in Animals

An extensive database on the effects of lead in animals is available and is too large to cite fully in this review. For a recent review, the publication by ATSDR (2007) is recommended to the reader. In general, the findings reported in the animal studies provide support for effects observed in human studies, although no animal model for the effects of lead equivalent to the subtle effects observed in humans is currently available. In addition, a large database concerning the dose-effect relationships in humans exists and is more suitable for health effects assessments than are the animal data.

Acute Effects

Mean lethal dose (LD_{50}) values for lead compounds were not found in the literature, however there are lowest lethal dose (LD_{Lo}) values ranging from 20,500 mg/kg for lead sulfate in guinea pigs to 191 mg/kg for lead acetate in the dog (Sax, 1984). These are the lowest doses expected to cause death. For reproductive toxicity effects, Kennedy *et al*. (1975) reported an increase in fetal resorptions, retarded skeletal development, and maternal toxicity in rats treated with acute oral lead acetate doses of 390 mg/kg-day.

In vitro assessment of changes to mammalian neurogenesis using a well-characterized cortical precursor model was reported by Davidovics and DiCicco-Bloom (2005) using a moderate level of lead acetate. Gestational day 14.5 rat cerebral cortical precursor cells were cultured in defined media. Cell number, precursor proliferation, apoptosis, and neuritic process outgrowth were assessed following exposure to a range of 1 to 30 μg/mL lead acetate. A concentration of 30 μg/mL lead acetate was acutely toxic to neurons while concentrations between 1 and 10 μg/mL increased cell number 10 fold by day 4, compared to control. The increase in cell number was not a result of increased proliferation, but rather due to reduced apoptosis (i.e., less programmed cell death). Additionally, neuritic process initiation and outgrowth increased in a concentration-dependent manner. Processes were four times as abundant on day 1 and twice as long on day 2. The results suggest that brief exposure to lead during neurogenesis directly affects cell survival and process development, potentially altering cortical arrangement.

Vargas *et al*. (2003) evaluated the effects of lead on renal function, lipid peroxidation, and expression of heme oxidation in rat kidney. A single injection of lead acetate (50 mg/kg) was given to rats. Thiobarbituric acid reactive substances (TBARS) levels increased in kidney cortex 24 hours after lead administration. These changes reported in the kidney were suggested to be due to oxidative stress, indicated by the increased TBARS, caused by the administration of lead. In kidney cortex, lead exposure affected the expression of HO-1, a renal protein associated with oxidative stress. HO enzymatic activity and HO-1 protein increased six and three hours after lead administration, respectively, and remained increased at 24 hours. HO inhibition by tin-protoporphyrin potentiated lead-induced increase in TBARS and prevented the lead-induced reduction in Na+ excretion.

The effects reported by Vargas *et al*. (2003) agreed with those reported earlier by Karmakar *et al*. (1986). A dose of 44 mg/kg for durations of 9, 15 or 30 days was evaluated in groups of five Sprague-Dawley rats. After nine days, mild shortening of the intestinal villi was seen in two of five rats and histological changes in the liver were observed in all rats. No renal abnormalities were observed at day 9. After 15 days, intestinal and liver abnormalities had progressed and affected more animals than at nine days; three of five rats showed histological kidney abnormalities.

Qian *et al*. (2000) reported that the synthesis of glucose regulated protein 78 (GRP78) was increased in a protective response to lead. The authors exposed cultured C6 rat glioma cells, an astroglia-like cell line, to 1 microM lead acetate for 1 week and found raised intracellular levels of two proteins, one of which was GRP78. For GRP78, accumulation started within 1 day and progressed with time of exposure.

More recently, Lasky *et al*. (2007) reported that exposure to lead caused a decrease in cerebral white matter in Rhesus monkeys exposed pre or postnatally. Different regions of the brain of 13 17-year old monkeys were measured with volumetric magnetic resonance imaging (MRI) techniques. Three animals had been exposed prenatally (conception to birth) through mothers treated with 8.6 mg/kg-day lead acetate in drinking water; four animals had been exposed postnatally (birth to weaning or ~5 months) while breastfeeding on females exposed to 9.1 mg/kg-day to lead acetate in water; and 8 animals had not been treated and served as controls. The median maternal blood lead level for the prenatal group during pregnancy was 62.0 μg/dL while the medium maternal blood lead level for the postnatal group was 97.8 μg/dL. The median prenatal treatment offspring blood lead level during nursing was 26.5 μg/dL while the median postnatal treatment offspring blood lead level during nursing was 55.1 μg/dL. The animals in the prenatal group were only exposed in utero and not during nursing. The median control offspring blood lead level during nursing was 4.5 μg/dL. Blood lead levels for all lead-exposed infant monkeys declined after weaning and were <10 μg/dL by 2.5 years postpartum and <5 μg/dL by 4.5 years of age. No differences were noted between treated animals and controls in total brain size, perhaps due to small sample size. Statistically significant differences ($p<0.05$) were noted among groups in size of lateral ventricles and cerebral white matter; animals treated prenatally had the largest lateral ventricles and the least cerebral white matter.

Lead is also known to affect blood pressure. Bagchi and Preuss (2005) recently reported that young Sprague-Dawley rats had systemic blood pressure changes and decreased bone mineral density following exposure to 1 percent lead acetate in drinking water for 40 days. Systemic blood pressure levels increased acutely but returned to normal with the continued treatment, only to rise again above control levels several months after the lead exposure had ceased.

Chronic Effects

Numerous experiments in laboratory animals have demonstrated that lead has a wide variety of toxic effects across many different organ systems. Lead can affect the cardiovascular, gastrointestinal, hemolymphatic, urinary, immune, nervous, and reproductive systems as well as cause developmental effects in the offspring of treated dams and tumors in laboratory animals (ATSDR, 2007).

The effects of lead acetate in drinking water on the reproductive systems of male and female rats have been studied by a number of investigators. The best studies relate the oral dose to the blood lead level produced. Chowdury *et al.* (1984) observed reduced sperm counts in male rats that had blood lead levels of 72 μg/dL. No effects were observed in male rats with blood lead levels of 54 μg/dL. Both male and female rats were studied by Hilderbrand *et al.* (1973). They observed irregular estrus cycles in female rats with blood lead levels of 30 μg/dL. Ovarian follicular cysts were produced in female rats with 53 μg/dL blood lead levels. They found increased prostate weight in male rats with 19 μg/dL of blood lead, and testicular damage in male rats with 30 μg/dL blood lead.

Cardiovascular effects in animals were recently reviewed by Vaziri and Sica (2004), who discussed the role of oxidative stress in lead-induced hypertension.

Lead acetate, given orally, has been demonstrated to cause cancer in animals (Azar *et al*., 1973). This study yielded a dose-dependent increase in the incidence of kidney tumors in rats (Table 1) and has been used to estimate the oral cancer potency of lead (OEHHA, 1997; ATSDR, 2007). In this experiment, rats were fed lead acetate in their diet for two years. Kidney tumors were produced in a dose-related manner.

Table 1. Kidney Tumor Incidence in Rats Administered Lead Acetate in the Diet (Azar *et al.*, 1973).

Dose (mg/kg-day)	Number of Rats in Dose Group	Number of Rats with Kidney Tumors
0.23	20	0
0.39	100	0
1.40	50	0
4.78	50	0
10.9	50	0
42.3*	20	5
79.7*	20	10
167*	20	16

*Treatment was begun for the groups with only 20 rats per dose several months after the other dose groups, although all were treated for two years.

Summary of Animal Toxicity

Lead can affect the cardiovascular, gastrointestinal, hemolymphatic, urinary, immune, nervous, and reproductive systems as well as cause developmental effects in the offspring of treated dams and tumors in laboratory animals. Since the neurobehavioral changes are the more sensitive effects, the review focused on these reports. In general, the findings reported in the animal studies provide support for effects observed in human studies. In addition, a large database concerning the dose-effect relationships in humans exists and is more suitable for health effects assessments than are the animal data.

Toxicological Effects in Humans

Exposure to lead has been associated with a large variety of human toxicological effects. Lead is known to cause changes in the cardiovascular, hematological, musculoskeletal, renal, reproductive, neurological, and immunological systems. In addition, lead may cause an increased risk of lung and stomach cancer. A brief summary is provided below on the acute and chronic effects associated with exposure to lead. The main focus of the literature review will be on the most sensitive population – children – and most sensitive endpoint – neurobehavioral effects (Lanphear *et al*., 2000; Canfield *et al*., 2003; Chiodo *et al*., 2004). Some recent articles describing the effects of lead to various systems are Borja-Aburto *et al*. (1999), Lopez *et al*. (2000), Luchini *et al*. (2000), Sallmen *et al*. (2000), Steenland and Boffetta (2000), Cheng *et al*. (2001), Bockelmann *et al*. (2002), Gemmel *et al*. (2002), Gerr *et al*. (2002), Hernandez-Avila *et al*. (2002), Nawrot *et al*. (2002), Rothenberg *et al*. (2002), Muntner *et al*. (2003), Selevan *et al*. (2003), Sun *et al*. (2003), Wright *et al*. (2003), Wu *et al*. (2003), and Tsaih *et al*. (2004).

Acute Effects

Following ingestion or inhalation, the principal acute effect in humans is colic. This is a painful condition involving cramps and gastrointestinal distress. The effect is observed at blood lead levels in the range of about 40 to 120 μg/dL in adults (Awad el Karim *et al*., 1986; Pollock and Ibels, 1986; Pagliuca *et al*., 1990). Colic occurs most frequently to workers exposed to lead in the workplace as lead-bearing dust or lead fumes from soldering or welding (Meiklehohn, 1963). Colic is also a symptom of lead poisoning in children. U.S. EPA (1986) reported a Lowest Observed Adverse Effect Level (LOAEL) of approximately 60 to 100 μg/dL of blood in children.

Chronic Effects

Chronic exposure to lead has been demonstrated to affect many systems of the body including the nervous, renal, cardiovascular and reproductive systems. The effects occur at different levels of exposure. In children, the lowest level at which each of the chronic effects is observed is illustrated by Figure 1. Reference will be made to the figure within each section described below. The focus of the summary will be on effects on children; primarily the neurobehavioral effects due to lead exposure.

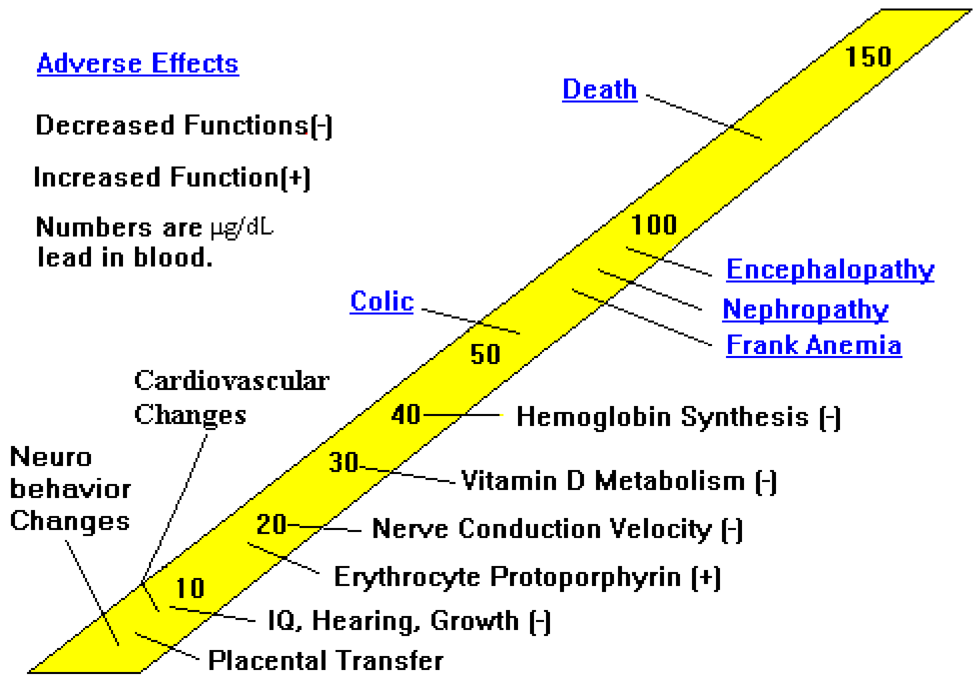

Figure 1: Demonstrated Effect Levels of Inorganic Lead in Children. The numbers in the diagram are blood lead levels at which studies have adequately demonstrated an effect, not necessarily the lowest level at which lead exerts the indicated effect.

Cardiovascular Effects

For humans, the greatest cardiological concern at low exposures and low blood lead levels is elevation in systemic blood pressure and decrements in glomerular filtration rate, which are mechanistically related. Schwartz (1991, 1995) earlier found that increased blood lead levels resulted in hypertension. Effects were observed in both children and adults, especially in middle aged males. Hypertension may also be caused in females or other age groups, but it has been most extensively studied in middle-aged males. Several authors have conducted meta-analyses of studies published between 1980-2001 (31 studies; Nawrot *et al*., 2002), 1984-1993 (23 studies; Staessen *et al*., 1994), and 1985-1993 (15 studies; Schwartz, 1994). An increase in systolic blood pressure of approximately 1–1.25 mm Hg can occur with each doubling of blood lead concentration (Schwartz, 1995; Staessen *et al*. 2000; Nawrot *et al*., 2002). Corresponding 95 percent confidence intervals (CI) reported were 0.5-1.5 mm Hg, 0.4-1.6 mm Hg, and 0.87-1.63 mm Hg, respectively. Mean blood lead concentrations reported were 1.9-7 µg/dL. Other cardiovascular changes include cardiac conduction and rhythm (Cheng *et al*., 2001; Bockelmann *et al*., 2002).

Nash *et al*. (2003) has reported an association between blood lead level and systolic and diastolic blood pressure in women aged 40 to 59 years, where the relationship is most pronounced in postmenopausal women. A small statistically significant adjusted change in systolic and diastolic blood pressures was associated with changes in blood lead level quartile from the lowest (0.5-1.6 μg/dL) to the highest (4.0-31.1 μg/dL). Women with the highest exposures had increased risks of diastolic (>90 mm Hg) hypertension (Odds Ratio [OR] = 3.4; 95 percent CI = 1.3-8.7) and systolic (>140 mm Hg) hypertension (OR = 1.5; 95 percent CI = 0.72-3.2). The association in postmenopausal women was strongest with adjusted ORs for diastolic hypertension increasing with higher blood lead levels. The adjusted OR compared to the lowest blood level group was 4.6 (95 percent CI = 1.1-19.2) for quartile 2, 5.9 (95 percent CI = 1.5-23.1) for quartile 3, and 8.1 (95 percent CI = 2.6-24.7) for quartile 4 (the highest exposure group).

Epidemiological studies have also reported differences in cardiological effects between white and black Americans. Vupputuri *et al*. (2003) examined the relation between blood lead levels and blood pressure in a representative sample of 14,952 whites and blacks aged 18 years or older. For their multivariate analysis, co-variables were adjusted. The authors found that mean blood lead levels were significantly higher for black men and women (5.4 and 3.4 μg/dL, respectively) compared with white men and women (4.4 and 3.0 μg/dL, respectively). In addition, the authors reported that the higher blood lead was associated with a 0.82 mm Hg and a 1.55 mm Hg higher systolic blood pressure among black men (95 percent CI 0.19 to 1.44 mm Hg) and women (95 percent CI, 0.47 to 2.64 mm Hg), respectively. In contrast, Vupputuri *et al*. (2003) did not find an association between blood lead level and blood pressure among white men or women. The multivariate-adjusted odds ratio (95 percent CI) of hypertension associated with a one standard deviation higher level of blood lead was 1.08 (95 percent CI, 0.99 to 1.19) for black men and 1.39 (95 percent CI, 1.21 to 1.61) for black women. The earlier review of the dataset by Den Hond *et al*. (2002) did not find a consistent relationship between blood pressure and blood lead.

In a more recent review, Navas-Acien *et al.* (2007) also infer a causal association between lead exposure and increased blood pressure in adults. The authors identified about 3,100 studies from which only 62 met the author's criteria for inclusion in their review. Some studies indicated an effect below 5 μg/dL blood lead level while others did not, indicating overall no clear evidence of a threshold in the studies in their review.

The blood lead level at which the cardiovascular effects appear to begin is approximately 10 μg/dL in children (Schwartz, 1991). Similar or lower levels of blood lead are also associated with blood pressure changes in adults as observed in the epidemiological studies of Nawrot *et al*. (2002) and Navas-Acien (2007). Overall, the meta-analysis data suggest that there is an association between blood pressure and blood lead level in children and adults, where the effect in children is weaker than the one observed with male adults. However, the effects are being reported at blood lead levels below 10 μg/dL (Table 2) in both children and adults, which makes this a critical effect.

Hematological Effects

When lead levels are in the 50 to 100 μg/dL range, anemia may result. Anemia may be a consequence of several factors, including suppression of the heme synthesis pathway by altering σ-aminolevulinic acid dehydratase (ALAD) and ferrochelatase activity, leading to shortage of hemoglobin and increased fragility of red blood cell membranes, which result in a shorter life span of red blood cells. The effect on the heme synthesis pathway leads to an increase in σ-aminolevulinic synthetase (ALAS) enzyme activity that leads to urinary porphyrins, coproporphyrin, and σ-aminolevulinic acid (ALA); increased blood and plasma ALA; and increased erythrocyte protoporphyrin (EP) levels. Threshold blood lead levels for decreased hemoglobin levels in adults and children are estimated to be 50 and 40 μg/dL, respectively (ATSDR, 2007). However, threshold lead blood levels for the ALAD and EP are much lower. The most sensitive endpoint, ALAD activity, was reported to be inversely correlated with lead blood levels of 3 to 34 μg/dL in the general population (Hernberg and Nikkanen, 1970; Chisolm *et al.*, 1985; ATSDR, 2007). Threshold blood lead for increased urinary ALA were 40 μg/dL and 30 μg/dL in adults and children, respectively, while the threshold for blood EP increases were 30 μg/dL and 15 μg/dL for adults and children, respectively (ATSDR, 2007).

Renal Effects

Lead exposure at doses intermediate between those that cause intelligence deficits and those that lead to encephalopathy may result in nephrotoxicity. Nephrotoxicity is characterized by proximal tubular nephropathy, glomerular sclerosis, and interstitial fibrosis (Diamond, 2005). This effect has been demonstrated in humans and animals. The mechanism involves structural changes in the kidney tissue that lead to blockage of the kidney tubules (Fowler and DuVal, 1991). Blood lead levels at which changes in renal parameters have been observed range from 6 to 100 μg/dL (ATSDR, 2007). For adults (>20 years of age; N ~ 5,000), the lowest blood lead levels reported to cause a change in serum creatinine or creatinine clearance was 5-10 μg/dL. In children (ages 4.6-13; N ~ 755), the lowest levels of blood lead reported to cause changes in renal function parameters were 12-34 μg/dL. Muntner *et al*. (2003) found a significant relationship between serum creatinine and blood lead levels when blood lead levels were below 10 μg/dL following adjustments for age and covariables contributing to glomerular disease. More recently, Ekong *et al.* (2006) found a decrease in creatinine clearance with blood lead levels below 5 μg/dL from the longitudinal studies reviewed.

Reproductive Effects

A potential association between occupational/environmental lead exposure and reproductive parameters in humans has been reported in men and women. The effects are associated with moderately high blood lead levels (ATSDR, 2007). In women, abortion and pre-term delivery are the effects reported (Borja-Aburto *et al*., 1999). In more recent studies, a decreased fertility was associated with longer exposures to lead and higher blood lead levels (Sallmen *et al.*, 2000; Shiau *et al.*, 2004). In these studies, abortion and pre-term delivery in women and decreased fertility in men were associated with blood lead levels above 12 and 30 μg/dL, respectively. However, other studies found no association with similar blood lead levels (Murphy *et al*., 1990; Apostoli *et al*., 2000; Joffe *et al*., 2003).

Neurological and Neurobehavioral Effects

Neurological and neurobehavioral effects have been reported to occur in children and adults. Children suffer encephalopathy at lower doses than adults. Encephalopathy during the 12 to 15 months after birth, during which the child's brain is developing, may lead to irreversible brain damage (Hutton, 1987; ATSDR, 2007). Lead encephalopathy is characterized by dullness, irritability, poor attention span, headache, muscular tremor, loss of memory and hallucinations. More severe cases exhibit delirium, convulsions, paralysis, coma and death (Kumar *et al.*, 1987). When children or fetuses receive high doses of lead (resulting in blood lead levels near 100 μg/dL) encephalopathy may result. For adults, encephalopathy has been reported to occur at blood lead levels of 40-120 μg/dL (ATSDR, 2007).

More recently, Dogu *et al*. (2006), in a case-control study, reported a relationship between higher lead blood levels in adults with an increased diagnosis of essential tremors (ET). The average blood lead level found in ET cases was 2.5 μg/dL compared to 1.5 μg/dL for controls ($p < 0.001$). The association in an unadjusted and adjusted logistic regression model was determined to be a four-fold increase of ET (OR = 4.01, 95 percent CI 2.53–6.37, $p < 0,001$). In addition, the authors reported that each 1 μg/dL increase in blood lead was associated with a four-fold increased odds of ET.

Shih *et al*. (2007) reviewed several environmental and occupational studies from 1996 to 2006 and found an association between acute or chronic exposure to lead in adults and neurobehavioral (i.e., cognitive function) outcomes. The authors reported that there was an association of lower cognitive function in populations with blood lead level as low as 4.5 μg/dL and mean tibia lead levels as low as 18.7 μg/dL. Blood lead level is a measure of current biologically active lead burden and measures acute effects, whereas the lead levels in bone are a measure of cumulative dose over decades.

Numerous studies have been conducted on the effects of low lead exposure on the intelligence of children in the U.S. and other countries. For some recent reviews, the reader is referred to Lidsky and Schneider (2003), Bellinger (2004), Koller *et al*. (2004), and Needleman (2004). Earlier, Needleman indicated that blood lead levels as low as 10 μg/dL may cause deficits in learning ability in very young children. Children who had umbilical cord blood lead levels at birth of 10 μg/dL or higher had poorer performance on intelligence tests and in school (Needleman, 1982). A four-year follow-up of these children showed that they had poorer classroom attention than the children with less lead exposure (Needleman, 1987).

Banks *et al*. (1997) also observed maladaptive behavior, slower reaction times, decreased nerve conduction velocity, and reduced Intelligence Quotient (IQ) scores, and reading, spelling, and mathematics performance, in pre-school and school-age children with increasing blood or tooth lead levels after reviewing epidemiological studies conducted in the 1970s and 1980s. The children examined generally had a minimum blood lead level in the range of 5-9 μg/dL and a maximum blood lead level in the range of 32-60 μg/dL. In reviewing some longitudinal studies done in the late 1980s and early 1990s, the authors found a significant inverse relationship between blood lead level for children exposed at birth to 5 years of age and one or more measures of linguistic ability, visual-spatial relations, sensory-motor co-ordination, memory, motor skills, verbal, perceptual, or quantitative skills, or various measures of achievement (Banks *et al*, 1997). The blood lead levels in these children generally ranged from 1-8 μg/dL at the low end to 15 to 35 μg/dL at the high end.

Several recent studies have implied that there is no apparent threshold in the relationship between blood lead level and neurobehavioral functions. Lanphear *et al*. (2000) found an inverse association with four cognitive measures (arithmetic skills, reading skill, nonverbal reasoning, and short-term memory) and geometric mean blood lead levels after analyzing data obtained from 4,853 U.S. children, ages 6-16 years, as part of the NHANES III, 1988-1994. The geometric mean blood lead level of the population was 1.9 μg/dL and 2.1 percent exceeded 10 μg/dL. All end points were significantly affected when blood lead levels were below 10 μg/dL. When blood lead level was restricted to below 5 μg/dL, the inverse relationship was significant for two endpoints (arithmetic skills and reading skills) (Lanphear *et al*., 2000). Other studies have also found an association between low (<10 μg/dL) blood lead levels and decreased IQ (Schwartz, 1994; Shen *et al*., 1998; Schnaas *et al*., 2000, 2006; Al-Saleh *et al*., 2001; Gomaa *et al*., 2002; Bellinger and Needleman, 2004; Canfield *et al*., 2003, 2004; Carta *et al*., 2003; Emory *et al*., 2003; Chiodo *et al*., 2004; Chen *et al*., 2005). These results corroborate those of Lanphear *et al*. (2000) and further support the opinion that lead can have effects on cognition in some segments of the population at blood lead levels below 10 μg/dL. In fact, association with decreased attention, visual motor integration, social behavior and motor skills was observed in children with a blood lead level as low as 3 μg/dL (Chiodo *et al*., 2004). The mean blood lead level reported in Chiodo *et al.* (2004) was 5.4 μg/dL for a total of 237 children at 7.5 years of age.

A more recent study evaluating cognitive instead of aptitude outcomes found a robust relationship between cognitive outcome and blood lead level at low levels of lead exposure in children. Miranda *et al*. (2007) analyzed performance in end-of-grade (EOG) testing (i.e., reading and mathematics) from 2000-2004 in children from 7 counties in North Carolina using exploratory and multivariate statistical methods. The authors report a decline of 15 percent and 14 percent of the interquartile range in EOG reading and mathematic scores, respectively, at a blood lead level of 5 μg/dL. Lower blood lead levels of 2 μg/dL also showed a trend in decrease of EOG scores.

Recently, Lanphear *et al*. (2005) analyzed blood lead levels and full-scale IQ data from 1,333 children, ages 58 months to 10 years, in seven international population-based longitudinal cohort studies. The reanalysis of the pooled data included the seven following prospective lead studies: Ernhart *et a*l. (1989); Baghurst *et al.* (1992); Bellinger *et al.* (1992); Dietrich *et al*. (1993); Wasserman *et al*. (1997); Schnaas *et al.* (2000; 2006); and Canfield *et al*. (2003). The children were administered a version of the Wechsler Intelligence Scales for Children-Revised, Wechsler Intelligence Scales for Children-III, Wechsler Preschool and Primary Scales of Intelligence, or Wechsler Intelligence Scales for Children-Spanish version under uniform conditions within each study. The authors used concurrent blood lead levels as the exposure metric in all of their analyses because it was the most strongly related to IQ. After adjustment for the 5 covariates that significantly affected IQ, Lanphear *et al*. (2005) described a log-linear model in which changes in blood lead level would correspond to decreases in IQ. With this model, a decline in IQ of 6.9 points (95 percent CI = 4.2-9.4) was associated with an increase in blood lead level from 2.4 to 30 µg/dL (the 5^{th} and 95^{th} percentiles, respectively). The model predicted decreases in IQ of 3.9 points (95 percent CI = 2.4-5.3), 1.9 (95 percent CI, 1.2-2.6), and 1.1 (95 percent CI, 0.7-1.5) with an increase in blood lead level from 2.4 to 10 µg/dL, 10-20 µg/dL, and 20-30 µg/dL, respectively. The authors concluded that maximal blood lead levels less than 7 µg/dL are associated with intellectual deficits.

Hornung (2005), a co-author in the Lanphear *et al*. (2005) study, fit a linear model to the blood lead level and IQ data for 703 children with concurrent blood lead levels below 10 µg/dL. The model estimates a slope of –0.47 with an upper end of the 97.5 percent CI ($UCL_{97.5}$) of –0.9 points per µg/dL. Jusko *et al.* (2008) have reported another study in 194 children showing similar correlations of IQ with blood lead levels from 6 months to 6 years of age.

Carlisle and Dowling (2006) reviewed the current literature and determined that a blood lead level increase of 1 µg/dL would be the lower-bound estimate to decrease IQ by 1 point. In their assessment, the studies of Lanphear *et al*. (2005) as well as Wang *et al*. (2002), Canfield *et al*. (2003), Emory *et al*. (2003), and Hornung (2005) were reviewed and found to provide evidence of neurobehavioral deficits at the lower blood lead level. In the end, the data from Lanphear *et al*. (2005) and re-analysis by Hornung (2005) were used by OEHHA to develop a draft child-specific health guidance value (HGV) for use in assessing risk at proposed or existing California school sites, which may include pre-school and day-care children (OEHHA, 2007). The study of Lanphear *et al*. (2005) was the basis for their assessment because the study reports on a sensitive endpoint (full-scale Wechsler IQ) in a large number of children (1,333; ages 58 months to 5 years), used appropriate measures of exposure, and evaluated appropriate covariates. The dataset provided sufficient statistical power to define the relationship between blood lead and cognitive function at lower blood lead levels within reasonably tight confidence limits.

Since the log linear model described by Lanphear *et al*. (2005) and the linear model described by Hornung gave a greater decrease in IQ at the lower blood lead level, OEHHA (2007) selected the 97.5 percent upper confidence limit ($UCL_{97.5}$) on the slope (-0.9 points per µg/dL) of the linear model as the basis for the child-specific benchmark change in blood lead concentration (ΔPb_B). The $UCL_{97.5}$ was used to account for variability and uncertainty in the data in order to be reasonably certain that the result is not an underestimate of the true slope. The linear model is expected to over-predict the drop in IQ at higher blood lead levels. OEHHA chose a model based on children in the lower half of the distribution because as population-wide blood lead levels continue to decline, more and more children will fall into this range. Also, OEHHA's mandate is to protect sensitive children, and these data suggest that children at the lower end of the exposure spectrum sensitive may exhibit a greater change in IQ for a given change in blood lead.

The child-specific benchmark change in blood lead concentration was calculated as follows:

$$BC_B = \frac{-1 \text{ IQ point}}{-0.90 \text{ IQ point per } \mu g/dL * (UF = 1)} = 1.1\ \mu g / dL\ Pb_B \text{, rounded to 1 µg/dL}$$

An uncertainty factor (UF) of one was used because there is no interspecies or intraspecies extrapolation, since the data are based on sensitive humans, and the database was not considered deficient. This value was established as the new child-specific health guidance value for lead (OEHHA, 2007).

Based on these studies of IQ in children and blood lead levels from the U.S. and other countries, it appears that there is good evidence that very low blood lead levels (10 µg/dL or lower) can have a deleterious effect (a decrease of several IQ points) on the learning ability and intellectual development of young children. A decrease of only a few IQ points may be very significant on a population level in terms of increased need for remedial education (CDC, 1991). The work by Lanphear *et al*. (2005) and the analysis of the current data by Carlisle and Dowling (2006) demonstrate that the neurobehavioral effects (decrease in IQ) can occur much lower than 10 µg/dL. The new child-specific health guidance value for lead of 1 µg/dL is also used in the calculation of the new PHG.

Genotoxic Effects

The potential genotoxic effects of lead have been evaluated in lead workers. Wu *et al*. (2002) and Duydu *et al*. (2001) found an increase in sister chromatid exchanges in workers with blood lead levels around 32-36 µg/dL. Vaglenov *et al*. (2001) also reported an association with blood lead levels above 25 µg/dL and increases in micronuclei frequency in lead workers. Other occupational, environmental, and in vitro studies have evaluated the genotoxic potential (ATSDR, 2007). However, not all the studies have had consistent findings. There are several studies with negative results. In all, lead is considered a clastogenic agent due to the potential to induce chromosomal aberrations, micronuclei, and sister chromatid exchanges in peripheral blood cells (ATSDR, 2007).

Cancer

Most studies assessing the potential carcinogenicity of lead has involved exposure of inorganic lead in lead workers. Landrigan *et al*. (2000), Silbergeld (2003), Silbergeld *et al*. (2000), and Steenland and Boffetta (2000) have recently published reviews on the potential carcinogenicity of lead. Risk level reported by Steenland and Boffeta (2000) for lung cancer was an RR of 1.14 (CI of 1.04-1.73; 675 observed deaths) and for combined stomach cancers, RR of 1.34 (CI of 1.14-1.57; 181 observed). In general, the epidemiology studies provide some evidence of increased risk of lung and stomach cancer with little evidence of increased risk of kidney or brain cancer.

However, orally administered lead acetate has been demonstrated to cause cancer in animals (i.e., it increased the incidence of kidney tumors in rats) (Azar *et al*., 1973). This study has been used as the basis for estimating the cancer potency of lead (OEHHA, 1997; ATSDR, 2007). Lead is regarded by the International Agency for Research on Cancer (IARC) and the U.S. EPA as an animal carcinogen and probable human carcinogen (IARC, 2004; NTP, 2005; U.S. EPA, 2005). Given that lead acetate is carcinogenic in rats (Azar *et al.*, 1973), other ionic salts would probably be carcinogenic as well.

Summary of Chronic Health Effects in Humans

The most significant health effects from the public health and regulatory point of view are the ones which occur at the lowest blood lead levels, because these affect the greatest part of the population. For children these are the effects on intelligence and behavior. For adults the most sensitive health effect is the increase in blood pressure and other cardiovascular effects. Both of these health effects are of concern below 10 μg/dL blood lead. Since measurable neurobehavioral effects in children for lead may occur with an increase of in blood lead of 1 μg/dL, this increase in lead level may be considered a shift of concern for both children and adults. Other health effects such as kidney and gastrointestinal effects occur at higher blood lead levels. See Figure 1 and Table 2 for a summary of these effects and the blood lead levels at which they occur.

DOSE-RESPONSE ASSESSMENT

Noncarcinogenic Effects

The most sensitive health endpoints for lead are intelligence deficits in children and hypertension (cardiovascular changes) in adults. The PHG was developed based on intelligence deficits in children, as this is the best-documented health endpoint that occurs at very low levels of exposure**.** The established public health-protective concentration will be applied to both children and adults.

Based on studies correlating blood lead levels with decreased IQ in children, the Centers for Disease Control (CDC) earlier identified 10 μg/dL as the lowest blood lead level of concern (CDC, 1991). Using an IEUBK model (Version 0.99d, 1994), OEHHA determined that for children between 12 and 24 months of age, a blood lead level increase of 0.35 μg/dL results from each increment in drinking water intake of 1.0 μg/day (OEHHA, 1997b). This was based on a calculation using the default values for exposure from dust, air, paint and other sources. Newer studies have demonstrated that neurobehavioral changes can occur at lower lead blood concentrations. Carlisle and Dowling (2006) found that an increase in blood lead levels of 1 μg/dL was correlated with a decrease of 1 IQ point based on the findings of Lanphear *et al*. (2005).

Therefore, the lead intake level that would correspond to the level of concern for children can be calculated as follows:

$$\text{Lead intake} = \frac{1\ \mu\text{g/dL (blood)}}{0.35\ \mu\text{g/dL per }\mu\text{g/day}} = 2.86\ \mu\text{g/day}$$

A daily lead intake from water ingestion of 2.86 μg/day corresponds to a 1 μg/dL increase in blood lead level. In other words, 2.86 μg/day can be used as a benchmark for daily oral intake from water that corresponds to a level of concern for neurobehavioral effects in children, designated as a decrease of 1 IQ point.

Carcinogenic Effects

The best study for assessment of the carcinogenic effects of lead by the oral route is the study by Azar *et al.* (1973). This study was used to determine a public health-protective concentration for carcinogenic endpoints in the 1997 lead PHG document. Lead acetate was administered in the diet of rats for two years. From the dose-related kidney tumor data, a cancer potency q_1* (animal) and oral cancer slope factor (CSF) were calculated using the Global 86 software. A q_1* (animal) of 1.53×10^{-3} $(mg/kg\text{-}day)^{-1}$ was obtained and converted to an equivalent human q_1* (5.98×10^{-3} $(mg/kg\text{-}d)^{-1}$). The LED_{10} (the 95 percent lower-bound dose resulting in a 10 percent tumor incidence) of 68.8 mg/kg-day was obtained to calculate the rat CSF of 1.45×10^{-3} $(mg/kg\text{-}day)^{-1}$. The CSF for the rat data was converted to a CSF for humans using the same body weight scaling ($3/4^{th}$ power) as described for the q_1*. This calculation yielded a CSF (human) of 5.68×10^{-3} $(mg/kg\text{-}day)^{-1}$. Therefore, the CSF (human), which was approximately equal to the q_1* (human), was used to calculate a health-protective value based on carcinogenicity.

CALCULATION OF PHG

Noncarcinogenic Endpoints

A public health-protective concentration (C) for lead in drinking water can be calculated using the following equation for the most sensitive non-carcinogenic endpoint, which is a decrease in IQ in children:

$$C = \frac{\text{Level of Concern} \times \text{RSC}}{\text{UF} \times \text{L/day}} = \text{mg/L}$$

where,

Level of Concern	=	daily lead intake which results in a 1 μg/dL increase in blood lead level for children (2.86 μg/day);
RSC	=	relative source contribution of 20 percent (0.2);
UF	=	uncertainty factor of 3-fold;
L/day	=	daily drinking water consumption volume for a child (1 L/day).

There is some uncertainty as to whether the level of concern of 2.86 μg/day for children, used in the equation above, is protective for all children, because there are children in the population whose blood lead levels are already above the concern level set by the CDC of 10 μg/dL (CDC, 2006). For these individuals any increase in blood lead level would simply add to an already adverse blood lead level. A threshold has not been observed for the non-carcinogenic effects (decrease in IQ points) of lead (Lanphear *et al.*, 2005; Schnaas *et al.*, 2006). In calculating the health-protective level for non-carcinogenic effects, an uncertainty factor of three is being applied to account for the uncertainty with regard to the degree of protection offered at this level, considering the lack of a threshold. The uncertainty factor of three also accounts for the extrapolation from the small sample size used in the main study of Lanphear *et al*. (2005) to the large, diverse population of children in California.

CDC's level of concern for lead in blood remains at 10 μg/dL, although CDC considers the actual level somewhat arbitrary because "there is no evidence of a threshold below which adverse effects are not experienced." However, the CDC level of concern has been consistently lowered over the last two decades, and may be lowered again in the future.

To calculate a health-protective level for non-cancer effects, children are assumed to consume 1 L of water/day. The drinking water contribution to children's lead exposure is estimated to range from 5 percent to over 50 percent (U.S. EPA, 1991) depending on the immediate environment in which the child lives. For children exposed to lead in paint, or lead in air and soil (e.g., living near roadways where lead deposits from engine exhaust still persist), U.S. EPA determined that drinking water exposure to lead would be on the lower end of this range. Therefore, in calculating a public health-protective concentration, we assume that drinking water exposures would contribute 20 percent of the total exposure to lead to account for exposures in children living in areas where high environmental concentrations of lead still persist.

Therefore,

$$C = \frac{2.86\ \mu g/day \times 0.2}{3 \times 1\ L/day} = 0.19\ \mu g/L = 0.2\ \mu g/L \text{ or } 0.2 \text{ ppb (rounded)}$$

Carcinogenic Endpoint

A public health-protective concentration (C) for lead (in mg/L) in drinking water can also be calculated using the general equation for carcinogenic endpoints:

$$C = \frac{R \times BW}{CSF \times L/day} = mg/L$$

where,

R = *de minimis* theoretical excess lifetime cancer risk of 1×10^{-6};

BW = default adult body weight of 70 kg;

CSF = cancer slope factor calculated above [5.68×10^{-3} (mg/kg-day)$^{-1}$];

L/day = volume of daily water consumption for an adult (2 L/day).

Therefore,

$$C = \frac{1 \times 10^{-6} \times 70 \text{ kg}}{5.68 \times 10^{-3} \text{ (mg/kg-day)}^{-1} \times 2 \text{ L/day}}$$

$$= 6.16 \times 10^{-3} \text{ mg/L} = 0.006 \text{ mg/L (rounded)} = 6 \text{ ppb}$$

The public health-protective concentration for lead based on the carcinogenic endpoint is 6 ppb. This is higher than the public health-protective concentration of 0.2 ppb calculated for non-carcinogenic effects. Therefore, the PHG for lead in drinking water is 0.2 ppb (0.2 μg/L or 0.0002 mg/L) based on non-carcinogenic effects.

RISK CHARACTERIZATION

The health risks of exposure to lead are well established by a large body of research. For the non-carcinogenic effects upon which the PHG is based (i.e., neurobehavioral effects in children), the research has been conducted on human populations. Therefore, there is no uncertainty in the calculation for extrapolation from animals to humans for these effects. The carcinogenic effect data are based on animal experimentation, which does introduce an uncertainty in extrapolating from animals to humans. The Azar *et al*. (1973) rat study, demonstrating kidney tumors after oral exposure to lead acetate, has the best available data for calculating a CSF.

Humans, especially children, may vary in their sensitivity to lead in drinking water because of differences in nutrition, exposure to lead from other sources and metabolic and genetic differences. Adults also may vary in their sensitivity to the hypertensive effects of lead.

The calculated PHG utilizes an RSC of 20 percent (0.2). This value is justified for certain subpopulations of children living in areas where lead in the environment still persists in moderate to high levels. Higher RSCs (up to 50 percent) might be justified for the general population because of the recent declines in relative contribution from air, water and food. The use of a higher RSC would increase the calculated PHG for non-carcinogenic endpoints for lead in drinking water.

OTHER STANDARDS AND REGULATORY LEVELS

Lead is regarded by IARC and the U.S. EPA as an animal carcinogen and probable human carcinogen (IARC, 2004; NTP, 2005; U.S. EPA, 2005).

U.S. EPA has adopted a Maximum Contaminant Level Goal (MCLG) of zero for lead in drinking water, based on "occurrence of low level effects" and because U.S. EPA classifies lead as Class B2, a "probable human carcinogen" (Fed. Reg. 56:32112, July 15, 1991; U.S. EPA, 2008). U.S. EPA has not adopted a Maximum Contaminant Level (MCL) for lead in drinking water because they regard the development of such a level as "not feasible" and rely on the "treatment approach" described in the final rule (Fed. Reg. 56:32112, July 15, 1991) to achieve the objective of reducing exposures to lead. However, U.S. EPA has set an "action level" for lead in drinking water of 15 ppb (40 CFR 141, 142; Fed. Reg. 56:26461-26564). This is a level the U.S. EPA believes is feasible for public water systems to attain by such measures as adjusting the physical characteristics of the water (pH, hardness) which affect the corrosivity of the water.

The lead and copper rule is a Federal and State drinking water standard (Title 22 CCR, section 64672.3) that specifies requirements for lead in drinking water systems (measured at the customers' taps). The action level (15 ppb) is used to determine the treatment requirements that a water system must complete. The action level for lead is exceeded if the concentration of lead in more than 10 percent of the tap water samples collected during any monitoring period (conducted in accordance with 22 CCR sections 64682 to 64685) is greater than 15 ppb. Failure to comply with the applicable requirements for lead and copper is a violation of primary drinking water standards for these substances (22 CCR Chapter 17.5). Therefore, for all practical purposes the standard described in the lead and copper rule is equivalent to an MCL. U.S. EPA has set a National Ambient Air Quality Standard of 1.5 $\mu g/m^3$ (Fed. Reg. 43:41258, October 5, 1978).

Lead is listed as a carcinogen and as a reproductive and developmental toxic chemical under the Safe Drinking Water and Toxic Enforcement Act of 1986, "Proposition 65" (California Health and Safety Code, Chapter 6.6, section 25249.5 *et seq*.). Lead is listed as a reproductive and developmental toxic chemical because of its effects on IQ during development. Under this program the exposure level set for warning against possible reproductive and developmental effects is 0.5 µg/day for any one source of exposure.

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ATTACHMENT

14

Number of Individual Children Screened for Lead, by Highest Level. California 2015

Local Health Jurisdiction	Age Group (years)	BLL < 4.5*		BLL ≥ 4.5 to < 9.5*		BLL ≥ 9.5*		Totals
		n	% (row)	n	% (row)	n	% (row)	
Alameda	**Age < 6**	16,915	97.71%	337	1.95%	59	0.34%	17,311
	Age 6 to < 21	1,577	95.98%	59	3.59%	7	0.43%	1,643
	Local Total age < 21	18,492	97.56%	396	2.09%	66	0.35%	18,954
Alpine	**Age < 6**	2	100.00%	0	0.00%	0	0.00%	2
	Age 6 to < 21	0	--	0	--	0	--	0
	Local Total age < 21	2	100.00%	0	0.00%	0	0.00%	2
Amador	**Age < 6**	404	98.30%	6	1.46%	1	0.24%	411
	Age 6 to < 21	17	100.00%	0	0.00%	0	0.00%	17
	Local Total age < 21	421	98.36%	6	1.40%	1	0.23%	428
Berkeley	**Age < 6**	756	97.05%	21	2.70%	2	0.26%	779
	Age 6 to < 21	41	100.00%	0	0.00%	0	0.00%	41
	Local Total age < 21	797	97.20%	21	2.56%	2	0.24%	820
Butte	**Age < 6**	2,115	98.56%	28	1.30%	3	0.14%	2,146
	Age 6 to < 21	44	95.65%	2	4.35%	0	0.00%	46
	Local Total age < 21	2,159	98.49%	30	1.37%	3	0.14%	2,192
Calaveras	**Age < 6**	186	98.94%	2	1.06%	0	0.00%	188
	Age 6 to < 21	57	100.00%	0	0.00%	0	0.00%	57
	Local Total age < 21	243	99.18%	2	0.82%	0	0.00%	245
Colusa	**Age < 6**	380	99.22%	2	0.52%	1	0.26%	383
	Age 6 to < 21	8	100.00%	0	0.00%	0	0.00%	8
	Local Total age < 21	388	99.23%	2	0.51%	1	0.26%	391
Contra Costa	**Age < 6**	8,093	99.25%	48	0.59%	13	0.16%	8,154
	Age 6 to < 21	494	98.60%	5	1.00%	2	0.40%	501
	Local Total age < 21	8,587	99.21%	53	0.61%	15	0.17%	8,655
Del Norte	**Age < 6**	267	97.80%	4	1.47%	2	0.73%	273
	Age 6 to < 21	19	100.00%	0	0.00%	0	0.00%	19
	Local Total age < 21	286	97.95%	4	1.37%	2	0.68%	292
El Dorado	**Age < 6**	552	93.09%	40	6.75%	1	0.17%	593
	Age 6 to < 21	56	100.00%	0	0.00%	0	0.00%	56
	Local Total age < 21	608	93.68%	40	6.16%	1	0.15%	649
Fresno	**Age < 6**	18,725	96.27%	587	3.02%	138	0.71%	19,450
	Age 6 to < 21	754	94.37%	42	5.26%	3	0.38%	799
	Local Total age < 21	19,479	96.20%	629	3.11%	141	0.70%	20,249
Glenn	**Age < 6**	388	98.48%	5	1.27%	1	0.25%	394
	Age 6 to < 21	21	95.45%	1	4.55%	0	0.00%	22
	Local Total age < 21	409	98.32%	6	1.44%	1	0.24%	416

Number of Individual Children Screened for Lead, by Highest Level. California 2015

Local Health Jurisdiction	Age Group (years)	BLL < 4.5*		BLL ≥ 4.5 to < 9.5*		BLL ≥ 9.5*		Totals
		n	% (row)	n	% (row)	n	% (row)	
Humboldt	**Age < 6**	2,093	89.67%	218	9.34%	23	0.99%	2,334
	Age 6 to < 21	102	91.07%	9	8.04%	1	0.89%	112
	Local Total age < 21	2,195	89.74%	227	9.28%	24	0.98%	2,446
Imperial	**Age < 6**	4,756	97.54%	107	2.19%	13	0.27%	4,876
	Age 6 to < 21	453	97.63%	11	2.37%	0	0.00%	464
	Local Total age < 21	5,209	97.55%	118	2.21%	13	0.24%	5,340
Inyo	**Age < 6**	19	90.48%	2	9.52%	0	0.00%	21
	Age 6 to < 21	0	--	0	--	0	--	0
	Local Total age < 21	19	90.48%	2	9.52%	0	0.00%	21
Kern	**Age < 6**	21,167	98.54%	254	1.18%	59	0.27%	21,480
	Age 6 to < 21	1,013	97.97%	18	1.74%	3	0.29%	1,034
	Local Total age < 21	22,180	98.52%	272	1.21%	62	0.28%	22,514
Kings	**Age < 6**	1,535	97.09%	39	2.47%	7	0.44%	1,581
	Age 6 to < 21	55	96.49%	2	3.51%	0	0.00%	57
	Local Total age < 21	1,590	97.07%	41	2.50%	7	0.43%	1,638
Lake	**Age < 6**	356	98.07%	7	1.93%	0	0.00%	363
	Age 6 to < 21	37	97.37%	1	2.63%	0	0.00%	38
	Local Total age < 21	393	98.00%	8	2.00%	0	0.00%	401
Lassen	**Age < 6**	179	87.32%	22	10.73%	4	1.95%	205
	Age 6 to < 21	3	60.00%	1	20.00%	1	20.00%	5
	Local Total age < 21	182	86.67%	23	10.95%	5	2.38%	210
Long Beach	**Age < 6**	7,208	99.02%	63	0.87%	8	0.11%	7,279
	Age 6 to < 21	532	99.07%	5	0.93%	0	0.00%	537
	Local Total age < 21	7,740	99.03%	68	0.87%	8	0.10%	7,816
Los Angeles	**Age < 6**	147,727	98.82%	1499	1.00%	270	0.18%	149,496
	Age 6 to < 21	15,556	98.87%	142	0.90%	35	0.22%	15,733
	Local Total age < 21	163,283	98.82%	1641	0.99%	305	0.18%	165,229
Madera	**Age < 6**	3,735	98.60%	42	1.11%	11	0.29%	3,788
	Age 6 to < 21	160	98.77%	2	1.23%	0	0.00%	162
	Local Total age < 21	3,895	98.61%	44	1.11%	11	0.28%	3,950
Marin	**Age < 6**	1,742	98.75%	18	1.02%	4	0.23%	1,764
	Age 6 to < 21	96	100.00%	0	0.00%	0	0.00%	96
	Local Total age < 21	1,838	98.82%	18	0.97%	4	0.22%	1,860

Number of Individual Children Screened for Lead, by Highest Level. California 2015

Local Health Jurisdiction	Age Group (years)	BLL < 4.5*		BLL ≥ 4.5 to < 9.5*		BLL ≥ 9.5*		Totals
		n	% (row)	n	% (row)	n	% (row)	
Mariposa	**Age < 6**	33	100.00%	0	0.00%	0	0.00%	33
	Age 6 to < 21	6	100.00%	0	0.00%	0	0.00%	6
	Local Total age < 21	39	100.00%	0	0.00%	0	0.00%	39
Mendocino	**Age < 6**	758	97.93%	15	1.94%	1	0.13%	774
	Age 6 to < 21	53	98.15%	1	1.85%	0	0.00%	54
	Local Total age < 21	811	97.95%	16	1.93%	1	0.12%	828
Merced	**Age < 6**	3,918	98.52%	51	1.28%	8	0.20%	3,977
	Age 6 to < 21	202	98.54%	3	1.46%	0	0.00%	205
	Local Total age < 21	4,120	98.52%	54	1.29%	8	0.19%	4,182
Modoc	**Age < 6**	98	96.08%	4	3.92%	0	0.00%	102
	Age 6 to < 21	3	100.00%	0	0.00%	0	0.00%	3
	Local Total age < 21	101	96.19%	4	3.81%	0	0.00%	105
Mono	**Age < 6**	74	90.24%	8	9.76%	0	0.00%	82
	Age 6 to < 21	1	100.00%	0	0.00%	0	0.00%	1
	Local Total age < 21	75	90.36%	8	9.64%	0	0.00%	83
Monterey	**Age < 6**	8,232	97.85%	144	1.71%	37	0.44%	8,413
	Age 6 to < 21	850	95.51%	29	3.26%	11	1.24%	890
	Local Total age < 21	9,082	97.62%	173	1.86%	48	0.52%	9,303
Napa	**Age < 6**	1,406	98.87%	16	1.13%	0	0.00%	1,422
	Age 6 to < 21	42	97.67%	0	0.00%	1	2.33%	43
	Local Total age < 21	1,448	98.84%	16	1.09%	1	0.07%	1,465
Nevada	**Age < 6**	613	95.78%	26	4.06%	1	0.16%	640
	Age 6 to < 21	27	96.43%	0	0.00%	1	3.57%	28
	Local Total age < 21	640	95.81%	26	3.89%	2	0.30%	668
Orange	**Age < 6**	39,258	98.83%	399	1.00%	66	0.17%	39,723
	Age 6 to < 21	4,318	98.36%	63	1.44%	9	0.21%	4,390
	Local Total age < 21	43,576	98.78%	462	1.05%	75	0.17%	44,113
Pasadena	**Age < 6**	2,114	98.37%	29	1.35%	6	0.28%	2,149
	Age 6 to < 21	234	100.00%	0	0.00%	0	0.00%	234
	Local Total age < 21	2,348	98.53%	29	1.22%	6	0.25%	2,383
Placer	**Age < 6**	927	97.37%	20	2.10%	5	0.53%	952
	Age 6 to < 21	72	94.74%	3	3.95%	1	1.32%	76
	Local Total age < 21	999	97.18%	23	2.24%	6	0.58%	1,028

Number of Individual Children Screened for Lead, by Highest Level. California 2015

Local Health Jurisdiction	Age Group (years)	BLL < 4.5*		BLL ≥ 4.5 to < 9.5*		BLL ≥ 9.5*		Totals
		n	% (row)	n	% (row)	n	% (row)	
Plumas	**Age < 6**	72	100.00%	0	0.00%	0	0.00%	72
	Age 6 to < 21	2	100.00%	0	0.00%	0	0.00%	2
	Local Total age < 21	74	100.00%	0	0.00%	0	0.00%	74
Riverside	**Age < 6**	35,066	99.40%	175	0.50%	35	0.10%	35,276
	Age 6 to < 21	1,962	98.94%	16	0.81%	5	0.25%	1,983
	Local Total age < 21	37,028	99.38%	191	0.51%	40	0.11%	37,259
Sacramento	**Age < 6**	16,468	98.15%	237	1.41%	73	0.44%	16,778
	Age 6 to < 21	1,154	96.09%	39	3.25%	8	0.67%	1,201
	Local Total age < 21	17,622	98.01%	276	1.54%	81	0.45%	17,979
San Benito	**Age < 6**	690	99.00%	5	0.72%	2	0.29%	697
	Age 6 to < 21	42	97.67%	0	0.00%	1	2.33%	43
	Local Total age < 21	732	98.92%	5	0.68%	3	0.41%	740
San Bernardino	**Age < 6**	38,598	99.29%	238	0.61%	39	0.10%	38,875
	Age 6 to < 21	3,159	99.46%	10	0.31%	7	0.22%	3,176
	Local Total age < 21	41,757	99.30%	248	0.59%	46	0.11%	42,051
San Diego	**Age < 6**	40,838	98.65%	478	1.15%	82	0.20%	41,398
	Age 6 to < 21	1,746	94.38%	94	5.08%	10	0.54%	1,850
	Local Total age < 21	42,584	98.46%	572	1.32%	92	0.21%	43,248
San Francisco	**Age < 6**	8,475	98.52%	104	1.21%	23	0.27%	8,602
	Age 6 to < 21	583	98.65%	7	1.18%	1	0.17%	591
	Local Total age < 21	9,058	98.53%	111	1.21%	24	0.26%	9,193
San Joaquin	**Age < 6**	11,590	98.41%	153	1.30%	34	0.29%	11,777
	Age 6 to < 21	732	98.52%	10	1.35%	1	0.13%	743
	Local Total age < 21	12,322	98.42%	163	1.30%	35	0.28%	12,520
San Luis Obispo	**Age < 6**	1,476	99.13%	9	0.60%	4	0.27%	1,489
	Age 6 to < 21	57	95.00%	3	5.00%	0	0.00%	60
	Local Total age < 21	1,533	98.97%	12	0.77%	4	0.26%	1,549
San Mateo	**Age < 6**	6,301	98.59%	80	1.25%	10	0.16%	6,391
	Age 6 to < 21	518	97.92%	9	1.70%	2	0.38%	529
	Local Total age < 21	6,819	98.54%	89	1.29%	12	0.17%	6,920
Santa Barbara	**Age < 6**	5,949	98.54%	70	1.16%	18	0.30%	6,037
	Age 6 to < 21	168	94.38%	9	5.06%	1	0.56%	178
	Local Total age < 21	6,117	98.42%	79	1.27%	19	0.31%	6,215

Number of Individual Children Screened for Lead, by Highest Level. California 2015

Local Health Jurisdiction	Age Group (years)	BLL < 4.5*		BLL ≥ 4.5 to < 9.5*		BLL ≥ 9.5*		Totals
		n	% (row)	n	% (row)	n	% (row)	
Santa Clara	**Age < 6**	19,611	98.55%	236	1.19%	53	0.27%	19,900
	Age 6 to < 21	2,039	97.98%	33	1.59%	9	0.43%	2,081
	Local Total age < 21	21,650	98.49%	269	1.22%	62	0.28%	21,981
Santa Cruz	**Age < 6**	2,649	97.82%	43	1.59%	16	0.59%	2,708
	Age 6 to < 21	358	98.62%	4	1.10%	1	0.28%	363
	Local Total age < 21	3,007	97.92%	47	1.53%	17	0.55%	3,071
Shasta	**Age < 6**	1,120	98.25%	15	1.32%	5	0.44%	1,140
	Age 6 to < 21	30	100.00%	0	0.00%	0	0.00%	30
	Local Total age < 21	1,150	98.29%	15	1.28%	5	0.43%	1,170
Sierra	**Age < 6**	13	92.86%	0	0.00%	1	7.14%	14
	Age 6 to < 21	0	--	0	--	0	--	0
	Local Total age < 21	13	92.86%	0	0.00%	1	7.14%	14
Siskiyou	**Age < 6**	88	91.67%	8	8.33%	0	0.00%	96
	Age 6 to < 21	9	100.00%	0	0.00%	0	0.00%	9
	Local Total age < 21	97	92.38%	8	7.62%	0	0.00%	105
Solano	**Age < 6**	5,248	98.09%	76	1.42%	26	0.49%	5,350
	Age 6 to < 21	154	98.09%	3	1.91%	0	0.00%	157
	Local Total age < 21	5,402	98.09%	79	1.43%	26	0.47%	5,507
Sonoma	**Age < 6**	3,616	99.29%	21	0.58%	5	0.14%	3,642
	Age 6 to < 21	304	95.60%	7	2.20%	7	2.20%	318
	Local Total age < 21	3,920	98.99%	28	0.71%	12	0.30%	3,960
Stanislaus	**Age < 6**	7,195	98.44%	95	1.30%	19	0.26%	7,309
	Age 6 to < 21	451	96.16%	17	3.62%	1	0.21%	469
	Local Total age < 21	7,646	98.30%	112	1.44%	20	0.26%	7,778
Sutter	**Age < 6**	1,531	97.89%	19	1.21%	14	0.90%	1,564
	Age 6 to < 21	48	100.00%	0	0.00%	0	0.00%	48
	Local Total age < 21	1,579	97.95%	19	1.18%	14	0.87%	1,612
Tehama	**Age < 6**	1,455	97.59%	35	2.35%	1	0.07%	1,491
	Age 6 to < 21	101	100.00%	0	0.00%	0	0.00%	101
	Local Total age < 21	1,556	97.74%	35	2.20%	1	0.06%	1,592
Trinity	**Age < 6**	47	92.16%	4	7.84%	0	0.00%	51
	Age 6 to < 21	19	100.00%	0	0.00%	0	0.00%	19
	Local Total age < 21	66	94.29%	4	5.71%	0	0.00%	70

Number of Individual Children Screened for Lead, by Highest Level. California 2015

Local Health Jurisdiction	Age Group (years)	BLL < 4.5*		BLL ≥ 4.5 to < 9.5*		BLL ≥ 9.5*		Totals
		n	% (row)	n	% (row)	n	% (row)	
Tulare	**Age < 6**	8,315	98.51%	104	1.23%	22	0.26%	8,441
	Age 6 to < 21	482	99.18%	1	0.21%	3	0.62%	486
	Local Total age < 21	8,797	98.54%	105	1.18%	25	0.28%	8,927
Tuolumne	**Age < 6**	135	98.54%	2	1.46%	0	0.00%	137
	Age 6 to < 21	15	100.00%	0	0.00%	0	0.00%	15
	Local Total age < 21	150	98.68%	2	1.32%	0	0.00%	152
Ventura	**Age < 6**	11,421	99.23%	81	0.70%	8	0.07%	11,510
	Age 6 to < 21	578	98.30%	9	1.53%	1	0.17%	588
	Local Total age < 21	11,999	99.18%	90	0.74%	9	0.07%	12,098
Yolo	**Age < 6**	2,275	97.60%	44	1.89%	12	0.51%	2,331
	Age 6 to < 21	75	96.15%	2	2.56%	1	1.28%	78
	Local Total age < 21	2,350	97.55%	46	1.91%	13	0.54%	2,409
Yuba	**Age < 6**	957	98.36%	12	1.23%	4	0.41%	973
	Age 6 to < 21	51	98.08%	0	0.00%	1	1.92%	52
	Local Total age < 21	1,008	98.34%	12	1.17%	5	0.49%	1,025
CLPPB	**Age < 6**	488	100.00%	0	0.00%	0	0.00%	488
(includes those with	**Age 6 to < 21**	43	100.00%	0	0.00%	0	0.00%	43
unknown jurisdiction)	**Local Total age < 21**	531	100.00%	0	0.00%	0	0.00%	531
California Totals	**Age < 6**	**528,418**	**98.57%**	**6,407**	**1.20%**	**1,250**	**0.23%**	**536,075**
	Age 6 to < 21	**41,783**	**98.11%**	**672**	**1.58%**	**135**	**0.32%**	**42,590**
	Total age < 21	**570,201**	**98.54%**	**7,079**	**1.22%**	**1,385**	**0.24%**	**578,665**

Notes for 2015 blood lead data. Data should be considered as preliminary and subject to revision.

*Data from RASSCLE surveillance database archive of 1/2/2017

Each individual is counted only once, using their highest blood lead level during 2015.

Measures are in µg/dL (micrograms per deciliter) of whole blood and include both venous and capillary samples. Not all elevated capillary samples are confirmed by a follow-up venous sample.

Results later determined to be false positives or errors have been excluded.

All results of blood lead analyses are reportable under California law, and the State works to ensure complete reporting. Results that are not submitted to the State, however, would not be included here.

Those blood lead levels reported from the analyzing laboratory as "< 5 µg/dL" are included in the category "BLL < 4.5"

If an individual moved between two jurisdictions, then the child's residence at the time of their highest blood lead level is the one counted.

ATTACHMENT

15

Reducing Lead in Drinking Water

A Technical Guidance for Minnesota's

School and Child Care Facilities

MINNESOTA MDH DEPARTMENT OF HEALTH

Environmental Health Division
Drinking Water Protection Section

Contents

Introduction

What is the Purpose of this Guidance?

This guidance is designed to assist Minnesota's schools and non-residential childcare centers (hereinafter "schools") in minimizing the consumption of lead in drinking water by students and staff. It is the hope of the Minnesota Department of Health (MDH) that school administrators will review the guidance and implement the suggested activities to reduce levels of lead in their drinking water.

MDH is charged with the implementation of the United States Environmental Protection Agency (EPA) federal drinking water requirements for public water supplies (PWS) throughout Minnesota. PWSs are required by rule to provide water that meets federal requirements. Due to the potential adverse health effects of lead, MDH has developed this guidance to aid in the prevention and treatment of lead in drinking water at schools that may not fall under the monitoring framework set up in the federal rule.

Who Should Use This Guidance?

This guidance is intended for use by all public and private schools, preschools, nursery schools, and non-residential childcare centers in Minnesota. School administrators and others in positions of governance should review this guidance and implement activities to reduce lead levels at all taps used for drinking water and in food preparation. The specific instructions provided regarding testing and corrective actions are designed for school health, safety, maintenance personnel, and any consultants working with educational agencies to reduce lead levels in school's drinking water.

Why Worry About Lead in Schools?

Lead is a toxic material known to be harmful to human health if ingested or inhaled. Blood lead levels as low as 5 micrograms per deciliter (µg/dL) are associated with adverse mental, physical and behavioral effects on children. **No** measureable blood lead level is without negative effects.

Health Risks of Lead:

Children:

Children are especially susceptible to lead exposure because their bodies absorb metals at higher rates than the average adult. Children younger than six years old are most at risk due to their rapid rate of growth. Exposure to high levels of lead can cause damage to the brain, nervous system, red blood cells, and kidneys. Exposure to low levels of lead have the potential to cause lower IQ's, hearing impairments, reduced attention span, hyperactivity, developmental delays, and poor classroom performance.

Adults:

High blood lead levels in adults have been linked to increased blood pressure, poor muscle coordination, nerve damage, and hearing and vision impairment. Pregnant women and their fetuses are especially vulnerable to lead exposure since lead can significantly harm the fetus, causing lower birth weight and slowing normal mental and physical developments.

Common Lead Exposures:

Lead in the environment:

- Lead based paint and some glazes
- Lead contaminated dust and soil
- Improper disposal of commercial products such as automotive batteries, computers, and other electronic and visual communication devices
- Industrial sources such as mining, smelting, and refining

Lead in drinking water:

- Lead enters tap water through corrosion of plumbing materials

Why is Lead a Special Concern for Schools?

Children are more vulnerable to lead:

Children typically have higher intake rates for environmental materials (such as soil, dust, food, water, air, paint) than adults. They are more likely to play in the dirt and put their hands and other objects in their mouths. In addition, children tend to absorb a higher fraction of ingested lead than adults, which can slow normal physical and mental development of growing bodies.

Plumbing materials and water use patterns at schools:

Lead levels in the water within the plumbing system of schools can vary due to the different parts of the plumbing system (i.e. lead solder, brass fixtures, water usage, and age of materials). The amount of time the water is in contact with the various components of the plumbing system may have a large effect on the concentrations found as well. The "on-again, off-again" water use patterns of most schools can result in elevated lead levels in drinking water. Water that remains stagnant in plumbing overnight, over a weekend, or during a vacation is in longer contact with plumbing materials and therefore may contain higher levels of lead.

How Does Lead Get Into Drinking Water?

Lead in drinking water is primarily from materials and components associated with the water distribution system and plumbing. Lead is typically an "endpoint" problem, with the highest concentrations of lead near the tap. Lead may be present in various parts of the plumbing system such as lead solder, brass fixtures, and lead pipes. Lead is then leeched into the water passing through the plumbing system. The most common source of lead leeching is corrosion, a reaction between the water and lead pipes or solder. Dissolved oxygen, low pH, low mineral content and other water quality characteristics can affect the extent of corrosion.

In addition to the characteristics mentioned above, the amount of contact time between water and lead sources can affect the concentration of lead found in drinking water. The longer water remains standing in the plumbing system, the greater the potential for it to absorb lead. For this reason, the lead concentration has the potential to be at its highest when water has remained unused overnight or longer. Additional factors such as water chemistry, temperature, and age of the plumbing materials can affect the amount of lead in the water.

What Can Be Done to Reduce Lead Levels in Drinking Water?

Use only cold water for drinking and food preparation:

Hot water is more likely to contain higher levels of lead than cold water. Only water from the cold water tap should be used for drinking, preparing juice, mixing baby formula or food preparation. Boiling the water will not remove lead and may actually increase the concentration of lead.

Flush taps before use:

The longer water has been standing in the plumbing system, the more lead it may contain. Running water at a tap, usually for two to three minutes, prior to using it for drinking or food preparation will often reduce lead levels in the water. Flushing works by removing the water with the most lead from the drinking water system. Taps should be flushed twice a day – in the morning and at midday.

Routine maintenance:

Clean aerators on a quarterly basis – more if debris buildup is observed.

Test the water for lead:

The only way to determine how much lead is present in the drinking water is to have the water tested. Each tap or fixture providing water for drinking or food preparation should be tested at least every five years. Corrective action should then be taken at taps with elevated lead levels. More detailed instructions on testing water for lead and information about corrective actions can be found on pages 10 - 14.

Legal Background and Guidance

For the purpose of this guidance, schools are classified in three categories:

A. Schools that receive their water from a Community Public Water Supply (CPWS).

B. Schools with their own source (well) and serve 25 or more people (children and employees combined).

C. Schools with their own source (well) and serve fewer than 25 people (children and employees combined).

Please note if you believe your school falls in Category B but have not been classified as a Nontransient Noncommunity (NTNC) PWS, please call 651/201-4700 and ask to speak with a NTNC Compliance Officer.

The table below displays the rules, regulations and guidance applicable to each school category. Each rule, regulation or guidance will be explained in detail in the following sections.

Regulations and Guidance Governing Lead in Schools Drinking Water

Category	Description	LCR[1]	LCCA[2]	3T's[3]	Reduction of Lead in Drinking Water Act
A	Water Supplied by a Community PWS	YES	YES	YES	YES
B	Water Supplied by private source & have >25 employees & children	YES	YES	YES	YES
C	Water Supplied by private source & have <25 employees & children	NO	YES	YES	YES

[1]**LCR** - Lead and Copper Rule
[2]**LCCA** - Lead Contamination Control Act
[3]**3T's** - Training, Testing and Telling

The Safe Drinking Water Act (SDWA), Lead and Copper Rule (LCR)

Category A:

If a school is served by a CPWS, the CPWS is required to monitor select sites throughout the area of coverage on a pre-set schedule. No more than ten percent (10%) of the samples monitored from a PWSs drinking water taps may exceed the lead action level of 15 parts per billion (ppb). If the action level is exceeded, the CPWS is legally required to take corrective action. Due to the nature of site selection per the LCR and the number of samples required, schools are unlikely to be selected as a site to monitor and therefore consideration should be given to implementing their own monitoring schedule based on this guidance.

Category B:

If a school is served by their own water source and serve 25 or more of the same people for a minimum of 6 months, they qualify as a NTNC PWS. As a NTNC PWS, a set number of sites are selected to be monitored on a pre-set schedule. No more than ten percent (10%) of the samples monitored from a school's drinking water taps may exceed the lead action level of 15 ppb. If the action level is exceeded, the school is legally required to take corrective action.

Category C:

If a school is served by their own water source and serve less than 25 people, the requirements of the LCR of the SDWA do not apply.

More information on the LCR can be found at:
http://water.epa.gov/lawsregs/rulesregs/sdwa/lcr/index.cfm.

The Lead Contamination Control Act (LCCA)

This law applies to all categories of schools. The intent of the LCCA is to identify and reduce lead in drinking water at schools and relies on voluntary compliance by individual schools and school districts.

More information on the LCCA can be found at:
http://water.epa.gov/infrastructure/drinkingwater/schools/regulations.cfm

3T's

EPA developed the 3T's (Training, Testing, and Telling) to assist all categories of schools in reducing the lead concentrations in their drinking water. MDH recommends that all schools adopt and implement a lead reduction program focusing on the following six areas:

- Determine current understanding of water quality and obtaining financial assistance
- Identification of potential problem areas
- Develop a monitoring plan
- Collection and submittal of water samples
- Implementation of corrective action plans if lead concentrations exceed 20 µg/L
- Communication and public outreach

A copy of the guidance can be found at:
http://www.epa.gov/ogwdw/schools/pdfs/lead/toolkit_leadschools_guide_3ts_leadschools.pdf

The Safe Drinking Water Act (SDWA), Reduction of Lead in Drinking Water Act

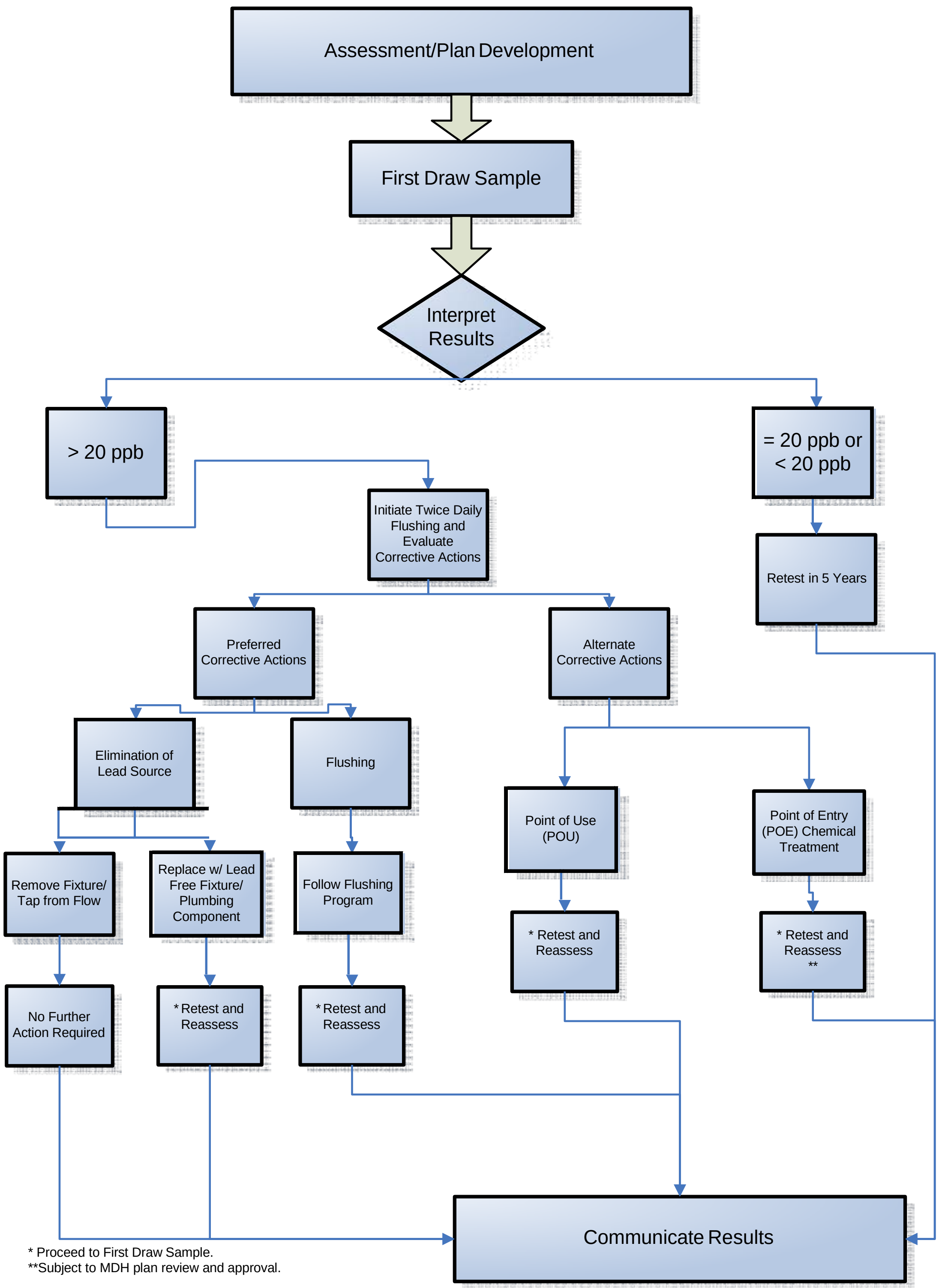
This law applies to all categories of schools. Lead found in drinking water is typically not from natural water and soil sources. The most common cause of lead concentration in water is due to the corrosion of pipes and plumbing fixtures. In an effort to reduce this contamination, EPA in 1986, amended the SDWA to mandate that all pipes, solders, fittings, and fixtures be lead free. Lead free was defined as solder and flux containing not more than 0.20% and lead, pipes, and pipefittings containing not more than 8.0% lead. All plumbing fittings and fixtures must meet the NSF/ANSI Standard 61.

In 2011, the enactment of the Reduction of Lead in Drinking Water Act was signed into law. The act reduces the allowable lead content in plumbing materials by modifying the SDWA definition of lead free. As of January 4, 2014, lead free is now defined as weighted average of not more than 0.25% in wetted surface material for pipe, pipe and plumbing fittings and fixtures. It retains the 0.20% lead limit for solders and flux as implemented in the 1986 amendments.

More information on the Reduction of Lead in Drinking Water Act can be found at: http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100GRDZ.txt.

How to Develop a Lead Monitoring and Reduction Plan

This schematic describes the six steps from Plan Development to Communicate Results. Details follow.



Step 1- Assessment and Sampling Plan Development:

When developing a program to test for lead in drinking water it is important to consider the following steps:

- Take inventory of all drinking water taps used for consumption (i.e. drinking water and food preparation)

  Taps used for human consumption should only be cold water taps; hot water taps should never be used to obtain water for drinking water or food preparation. Check all drinking fountains to ensure EPA has not identified them as having a lead lined tank under the LCCA. This list can be found at: http://tinyurl.com/kr8kppf

  If a drinking fountain within the school is found on this list, it should be removed from use immediately.

- Prioritize drinking water taps

  High priority: taps used by children under the age of six years of age or pregnant women (i.e. drinking fountains, nurse's office sinks, classrooms used for early childhood education and kitchen sinks).

  Medium priority: other taps regularly used to obtain water for drinking or cooking (i.e. home economic sinks, classroom sinks, and teacher's lounges).

  Low priority: all other taps that could be used to obtain water for drinking but are not typically used for that purpose (i.e. bathroom faucets and utility sinks).

- Determine a schedule for sampling

  All taps should be tested at a minimum of once every five years.

  If the budget does not allow all taps to be tested in the first year it is suggested that all high priority taps be tested the first year, the medium priority the second and the low priority the third. The fourth year should be used as a "make up" year if needed.

- Testing

  Determine which certified laboratory will analyze the drinking water samples and set up a contract with them. Certified laboratories can be found at:
  https://apps.health.state.mn.us/eldo/public/accreditedlabs/labsearch.seam.
  Field analyzers can be used in doing investigative work.

Step 2- Conduct First Draw Tap Monitoring:

Water from all taps used for drinking or food preparation should be tested for lead using first draw samples. First draw means that the samples are to be collected before the fixture is used or flushed during the day. Use only cold water for collecting lead samples.

Sample Site Preparation and Sample Collection

- The night before sampling, run each sample tap for two to three minutes.

- Do not use sampling taps for a minimum of six to eight hours. MDH recommends not exceeding 18 hours.

- Collect first draw sample. (250 mL)

  Option 1: Mail/deliver sample to laboratory certified to analyze lead in drinking water. Certified laboratories can be found at https://apps.health.state.mn.us/eldo/public/accreditedlabs/labsearch.seam. The laboratory will provide you with sample bottles and instructions for submitting samples.

  Option 2: Conduct an analysis using a field analyzer with a lower limit of detection (LOD) for lead equal to or below 5 ppb using instruments such as the Hach Pocket Calorimeter II, Lead Test or Hach SA 1100 Scanning Analyzer for Lead. Refer to manufacturer guidelines for correct sampling protocol and safety precautions in collection and disposal of samples.

Step 3- Interpret Sample Results:

- Verify that the results are expressed in ppb.

- If lead is at or below 20 ppb, the tap may be used for drinking water or food preparation and should be retested in five years. Proceed to Step 6.

- If lead exceeds 20 ppb, initiate twice daily flushing. Flush the tap in the morning before school begins and at midday. Evaluate and implement a corrective action plan. Proceed to Step 4.

Step 4- Corrective Actions:

In addition to twice daily flushing in Step 3, a corrective action needs to be implemented when results exceed 20 ppb. Although flushing often works to reduce lead in drinking water, it requires staff time, diligence, and commitment to ensure effectiveness and may not be the most cost effective long term corrective action.

Preferred:

Elimination of Lead Sources

Engineering plans and specifications for the plumbing system are useful for identifying sources of lead and helpful in determining if sources of lead can be removed from service or replaced with lead free fixtures.

- Remove tap/fixture from service. If the tap is seldom used, it may be disconnected or removed from the water supply line, but first verify the tap is not required for code compliance.

- Replace with lead free fixture/plumbing component.

- If the existing tap is suspected to be the source of contamination, replace with a lead free tap.

- Replace other sources of lead, including lead pipe, lead solder joints, and brass plumbing components with lead free materials.

To minimize the introduction of lead into drinking water systems, go to EPA website: http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100GRDZ.txt to identify lead free certification marks for drinking water systems and plumbing materials.

Implement a Flushing Program

Flushing the drinking water taps (letting them run for a set amount of time) often works to reduce lead concentrations in drinking water. A flushing program works to reduce lead concentrations by clearing the taps of water that have been in contact with plumbing components that may be high in lead. There are two primary types of flushing programs: Individual Tap Flushing and Main Pipe Flushing.

An **Individual Tap Flushing Program** may be implemented if lead concentrations are found to be high at certain taps.

- Flush individual taps that have been tested and found to have high lead levels. This procedure is to be followed each day the school is in session.

During periods of normal use:

- Run each tap in the morning before children arrive for 2 to 3 minutes.

- Run each tap midday for two to three minutes.

After long weekends or breaks:

- Run each tap for ten to fifteen minutes before children return to school.

Return to normal use protocol.

A **Main Pipe Flushing Program** may be implemented if lead concentrations are found to be high throughout the entire system or confined to a certain area of the school. This procedure is to be followed each day the school is in session.

- Begin by flushing the tap furthest away from the water source for at least ten minutes.

- Next flush the tap the second furthest away and continue in this manner until all taps have been flushed.

- First draw and flushed samples should be collected and analyzed for lead every six months.

Review the results upon receipt.

- If the flushed sample results are not below the lead action level, other corrective action options should be explored.

- If the flushed sample results are below the lead action level, the flushing program can continue.

- If first draw samples drop below the lead action level for two consecutive six month rounds of testing, the flushing program can be discontinued. Monitoring should continue to one more six month round to ensure the lead levels do not increase again.

Alternate:

Point-of-Use (POU) Treatment Device - A POU water treatment device may be installed at taps which exceed 20 ppb of lead. It is strongly encouraged that the POU device is approved to meet NSF Standard 53, NSF Standard 58, or an equivalent standard. It is to be installed, operated, and maintained in accordance with the manufacturer’s recommendations.

Point of Entry (POE) Chemical Treatment - Adjusting the water chemistry may reduce the amount of lead absorbed by the water. This may be done by adding a chemical to the water as it enters the building. Typical methods of chemical treatment include addition of a phosphate based or silica based corrosion inhibitor or an adjustment to the water’s pH or hardness. All chemical treatment systems may be subject to MDH plan review and approval prior to installation. It must be noted the installation of POE treatment may subject the school to other requirements of the SDWA including additional water quality monitoring.

Step 5- Reassessment:

All taps affected by a corrective action (Step 4) are retested after the corrective action has been implemented. A first draw sample is to be taken, using the procedure outlined in Step 2.

Interpreting Post Corrective Action Results

- If the analysis shows lead at or below 20 ppb, no further action is required, as long as the corrective action remains in place. The next sample should be collected within five years.
- If the analysis shows lead remains above 20 ppb, continue twice daily flushing. A midday sample as specified in Step 3 is to be collected to determine if flushing is effective or a new corrective action can be implemented followed by retesting as specified in Step 2.

Step 6- Communicate Results:

In addition to testing for lead, a lead control program should include a communication plan. The purpose of a communication plan is to provide a process for school employees, students and parents to address questions, report results and provide ongoing, up-to-date information regarding sampling efforts.

EPA recommends that school management:

- Assign a designated person to be the contact.
- Notify affected individuals about the purpose of the testing as well as the results. School employees, students and parents should be informed and involved in the overall process. Examples are: meetings, open houses, public notices.
- Identify and share specific activities they are pursuing to correct any lead problems. Local health officials can assist in understanding potential health risks, technical assistance and communication strategies.

More information and sample public notice materials can be found at:
http://www.epa.gov/ogwdw/schools/pdfs/lead/toolkit_leadschools_guide_3ts_leadschools.pdf

Glossary

1. Action Level - Lead exposure level at which corrective action is required

2. Aerator - An aerator is found at the tip of the faucet. Aerators are screwed onto the faucet head, creating a non-splashing stream and delivering a mixture of water and air

3. Corrosion - A dissolving and wearing away of metal caused by a chemical reaction between water and plumbing materials in contact with the water

4. Faucet/Tap - Point of access for people to obtain water for drinking or food preparation. A faucet/tap can be a fixture, faucet, drinking fountain or water cooler. Drinking water taps typically do not include bathroom taps, hose bibbs, or custodial closet sinks

5. Field Analyzer - Instrument suitable for water quality field work or analysis

6. First Draw Sample - The first water drawn from a faucet/tap after the water has sat undisturbed in the plumbing system for at least 6 hours

7. Fittings - Plumbing components used to join sections of pipe or to join pipe to fixtures

8. Fixture - Exchangeable device connected for the distribution and use of water in a building. Examples: fountain, sinks, shower, tub, toilet, hydrant

9. Flush(ing) - Running the water at a faucet/tap or combination of faucets/taps to clear standing water from the plumbing system

10. Flush Sample - A water sample that has been collected following the flushing of a drinking water tap

11. Flux - A substance applied during soldering to facilitate the flow of solder. Flux used prior to 1986 contains lead and can itself be a source of lead contamination in water

12. Lead Free - Weighted average of not more than 0.25% in wetted surface material for pipe, pipe and plumbing fittings and fixtures

13. Limit of Detection (LOD) – The lowest quantity of a substance that can be distinguished from the absence of the substance due to the instruments analytical process

14. pH - A measure of acidity and alkalinity

15. Parts per Billion (ppb) - A standard unit of measurement commonly used to describe the concentration of lead in drinking water. Also expressed as microgram/liter (µg/L)

16. Point of Entry (POE) - A water treatment device installed to treat all water entering a single school, building, facility or home. Example: water softener

17. Point of Use (POU) - A water treatment device intended to treat water for direct consumption, typically at a single tap or a limited number of taps. Example: faucet mount cartridge filter

18. Public Water System (PWS) - A system that serves water to the public. System has at least 15 service connections or regularly serves an average of 25 individuals daily at least 60 days out of the year.

    a. Community Public Water System (CPWS) - A PWS which serves at least 15 service connections used by year round residents or regularly serves at least 25 year round residents. Examples: municipalities, manufactured mobile home parks

    b. Nontransient Noncommunity (NTNC) - A PWS that is not a CPWS and that regularly serves at least 25 of the same persons over 6 months per year. Examples: schools, childcare centers, factory

19. Schools - Minnesota's schools and non-residential childcare centers

20. Service Connection - The pipe that carries tap water from the public water main to a building

21. Solder - A metallic compound used to seal the joints between pipes. Until 1988, solder containing up to 50% lead was legally used in potable water plumbing. Lead free solders, which can contain up to 0.2% lead, often contain one or more of the following metals: antimony, tin, copper or silver

22. United States Environmental Protection Agency (EPA) - Federal agency with a mission to protect human health and the environment

Minnesota Department of Health

Environmental Health Division
Drinking Water Protection Section

651-201-4700

Rev. 04/14
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DECLARATION OF SERVICE BY EMAIL

I, the undersigned, declare as follows:

I am a resident of the County of Sacramento and I am over the age of 18 years, and not a party to the within action. My place of employment is 980 Ninth Street, Suite 300, Sacramento, California 95814.

On August 15, 2018, I served the:

- **SWRCB's Comments on the Test Claim filed August 13, 2018**
- **Administrative Record on Permit Amendment No. 2017PA-SCHOOLS, City of San Diego Public Water System No. 3710020, effective January 18, 2017 filed August 13, 2018**
- **Finance's Comments on the Test Claim filed August 13, 2018**

  Lead Sampling in Schools, Permit Amendment No. 2017PA-SCHOOLS, City of San Diego Public Water System No. 3710020, effective January 18, 2017, 17-TC-03
  City of San Diego, Claimant

By making it available on the Commission's website and providing notice of how to locate it to the email addresses provided on the attached mailing list.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that this declaration was executed on August 15, 2018 at Sacramento, California.

Lorenzo Duran
Commission on State Mandates
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COMMISSION ON STATE MANDATES

Mailing List

Last Updated: 8/10/18

Claim Number: 17-TC-03

Matter: Lead Sampling in Schools, Permit Amendment No. 2017PA-SCHOOLS, City of San Diego Public Water System No. 3710020, effective January 18, 2017

Claimant: City of San Diego

TO ALL PARTIES, INTERESTED PARTIES, AND INTERESTED PERSONS:

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