Rules of
Department of Natural Resources
Division 60—Public Drinking Water Program
Chapter 15—Lead and Copper

Title 10—DEPARTMENT OF NATURAL RESOURCES
Division 60—Public Drinking Water Program
Chapter 15—Lead and Copper

10 CSR 60-15.010 General Requirements

PURPOSE: This rule gives an overview of requirements covered in the national primary drinking water regulations for lead and copper.

(1) Applicability and Effective Dates. The requirements of this chapter constitute the Missouri public drinking water rules for lead and copper. Unless otherwise indicated, each of the provisions of this chapter applies to community water systems and nontransient noncommunity water systems (after this referred to as water systems or systems).

(2) Scope. These rules 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.

(3) Lead and Copper Action Levels.

(A) The lead action level is exceeded if the concentration of lead in more than ten percent (10%) of tap water samples collected during any monitoring period conducted in accordance with 10 CSR 60-15.070 is greater than 0.015 milligrams/liter (mg/l) (that is, if the ninetieth percentile lead level is greater than 0.015 mg/l).

(B) The copper action level is exceeded if the concentration of copper in more than ten percent (10%) of tap water samples collected during any monitoring period conducted in accordance with 10 CSR 60-15.070 is greater than 1.3 mg/l (that is, if the ninetieth percentile copper level is greater than 1.3 mg/l).

(C) The ninetieth percentile lead and copper levels shall be computed as follows:

1. 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 one (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 monitoring period shall be multiplied by 0.9;

3. The contaminant concentration in the numbered sample yielded by the calculation in paragraph (3)(C)2. is the ninetieth percentile contaminant level; and

4. For water systems serving fewer than one hundred (100) people that collect five (5) samples per monitoring period, the ninetieth percentile is computed by taking the average of the highest and second highest concentrations.

(4) Corrosion Control Treatment Requirements.

(A) All water systems shall install and operate optimal corrosion control treatment as defined in 10 CSR 60-15.030.

(B) Any water system that complies with the applicable corrosion control treatment requirements specified by the state under 10 CSR 60-15.020 and 10 CSR 60-15.030 shall be deemed in compliance with the treatment requirement contained in subsection (4)(A).

(5) 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 10 CSR 60-15.040.

(6) 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 10 CSR 60-15.050.

(7) Public Education Requirements. Any system exceeding the lead action level shall implement the public education requirements contained in 10 CSR 60-15.060.

(8) 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 section shall be completed in compliance with 10 CSR 60-15.070, 10 CSR 60-15.080, 10 CSR 60-15.090 and 10 CSR 60-5.010(1).

(9) Reporting Requirements. Systems shall report to the state any information required by the treatment provisions of this section and 10 CSR 60-7.020.

(10) Recordkeeping Requirements. Systems shall maintain records in accordance with 10 CSR 60-9.010.

(11) Violation of National Primary Drinking Water Regulations. Failure to comply with the applicable requirements of 10 CSR 60-15.010—10 CSR 60-15.090, 10 CSR 60-5.010, 10 CSR 60-7.020 and 10 CSR 60-9.010, including requirements established by the state pursuant to these provisions, shall constitute a violation of the state public drinking water rules for lead, copper, or both.

AUTHORITY: section 640.100, RSMo (Cum. Supp. 1989). Original rule filed Aug. 4, 1992, effective May 6, 1993.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989.*

10 CSR 60-15.020 Applicability of Corrosion Control Treatment Steps to Small, Medium-Size and Large Water Systems

PURPOSE: This rule establishes deadlines for public water systems to complete corrosion control treatment required in 10 CSR 60-15.030 and to conduct associated monitoring.

(1) A large system (serving more than fifty thousand (50,000) persons) shall complete the corrosion control treatment steps as follows unless it is deemed to have optimized corrosion control under paragraph (1)(B)1. or 2.

(A) Treatment Steps and Deadlines for Large Systems.

1. The system shall conduct initial monitoring (10 CSR 60-15.070(4)(A) and 10 CSR 60-15.080(2)) during two (2) consecutive six (6)-month monitoring periods by January 1, 1993.

2. The system shall complete corrosion control studies (10 CSR 60-15.030(3)) by July 1, 1994.

3. The department shall designate optimal corrosion control treatment (10 CSR 60-15.030(4)) by January 1, 1995.

4. The system shall install optimal corrosion control treatment (10 CSR 60-15.030(6)) by January 1, 1997.

5. The system shall complete follow-up sampling (10 CSR 60-15.070(4)(B) and 10 CSR 60-15.080(3)) by January 1, 1998.

6. The department shall review installation of treatment and designate optimal water quality control parameters (10 CSR 60-15.030(7)) by July 1, 1998.

7. The system shall operate in compliance with the department-specified optimal water quality control parameters (10 CSR 60-15.030(8)) and continue to conduct tap

sampling (10 CSR 60-15.070(4)(C) and 10 CSR 60-15.080(4)).

(B) A large 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 (1) of the following criteria:

1. The system demonstrates to the satisfaction of the department that it has conducted activities equivalent to the corrosion control steps applicable to large systems. If the department 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 10 CSR 60-15.030(7). A system shall provide the department with the following information in order to support a determination:

A. The results of all test samples collected for each of the water quality parameters in 10 CSR 60-15.030(3)(C);

B. A report explaining the test methods used by the water system to evaluate the corrosion control treatments listed in 10 CSR 60-15.030(3)(A), the results of all tests conducted and the basis for the system's selection of optimal corrosion control treatment;

C. 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

D. The results of tap water samples collected in accordance with 10 CSR 60-15.070 at least once every six (6) months for one (1) year after corrosion control has been installed; and

2. The water system submits results of tap water monitoring conducted in accordance with 10 CSR 60-15.070 and source water monitoring conducted in accordance with 10 CSR 60-15.090 that demonstrates for two (2) consecutive six (6)-month monitoring periods that the difference between the ninetieth percentile tap water lead level, computed under 10 CSR 60-15.010(3)(C), and the highest source water lead concentration is less than the practical quantitation level for lead specified in 10 CSR 60-5.010(1)(H).

(2) A small system (serving fewer than three thousand three hundred (3300) persons) and a medium-size system (serving three thousand three hundred one to fifty thousand (3,301—50,000) persons) shall complete the corrosion control treatment steps specified as follows unless it is deemed to have optimized corrosion control under paragraph (2)(B)1., 2. or 3. of this rule:

(A) Treatment Steps and Deadlines for Small and Medium-Size Systems.

1. The system shall conduct initial tap sampling (10 CSR 60-15.070(4)(A) and 10 CSR 60-15.080(2)) until the system either exceeds the lead or copper action level or becomes eligible for reduced monitoring under 10 CSR 60-15.070(4)(D). A system exceeding the lead or copper action level shall recommend optimal corrosion control treatment (10 CSR 60-15.030(1)) within six (6) months after it exceeds one (1) of the action levels.

2. Within twelve (12) months after a system exceeds the lead or copper action level, the department may require the system to perform corrosion control studies (10 CSR 60-15.030(2)). If the department does not require the system to perform these studies, the department shall specify optimal corrosion control treatment (10 CSR 60-15.030(4)) within the following time frames:

A. For medium-size systems, within eighteen (18) months after that system exceeds the lead or copper action level, or

B. For small systems, within twenty-four (24) months after that system exceeds the lead or copper action level.

3. If the department requires a system to perform corrosion control studies under paragraph (2)(A)2. of this rule, the system shall complete the studies (10 CSR 60-15.030(3)) within eighteen (18) months after the department requires that those studies be conducted.

4. If the system has performed corrosion control studies under paragraph (2)(A)2. of this rule, the department shall designate optimal corrosion control treatment (10 CSR 60-15.030(4)) within six (6) months after completion of paragraph (2)(A)3. of this rule.

5. The system shall install optimal corrosion control treatment (10 CSR 60-15.030(6)) within twenty-four (24) months after the department designates that treatment.

6. The system shall complete follow-up sampling (10 CSR 60-15.070(4)(B) and 10 CSR 60-15.080(3)) within thirty-six (36) months after the department designates optimal corrosion control treatment.

7. The department shall review the system's installation of treatment and designate optimal water quality control parameters (10 CSR 60-15.030(7)) within six (6) months after completion of paragraph (2)(A)6. of this rule.

8. The system shall operate in compliance with the department-designated optimal water quality control parameters (10 CSR 60-15.030(8)) and continue to conduct tap sampling as specified in 10 CSR 60-15.070(4)(C) and 10 CSR 60-15.080(4);

(B) A small or medium-size water 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 (1) of the following criteria:

1. The system meets the lead and copper action levels during each of two (2) consecutive six (6)-month monitoring periods conducted in accordance with 10 CSR 60-15.070;

2. The system demonstrates to the satisfaction of the department that it has conducted activities equivalent to the corrosion control steps applicable to medium-size or small systems under this section. If the department 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 10 CSR 60-15.030(7). The system shall provide the department with the following information in order to support a determination:

A. The results of all test samples collected for each of the water quality parameters in 10 CSR 60-15.030(3)(C);

B. A report explaining the test methods used by the water system to evaluate the corrosion control treatments listed in 10 CSR 60-15.030(3)(A), the results of all tests conducted and the basis for the system's selection of optimal corrosion control treatment;

C. 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

D. The results of tap water samples collected in accordance with 10 CSR 60-15.070 at least once every six (6) months for one (1) year after corrosion control has been installed; or

3. The water system submits results of tap water monitoring conducted in accordance with 10 CSR 60-15.070 and source water monitoring conducted in accordance with 10 CSR 60-15.090 that demonstrates for two (2) consecutive six (6)-month monitoring periods that the difference between the ninetieth percentile tap water lead level, computed under 10 CSR 60-15.010(3)(C), and the highest source water lead concentration is less than the practical quantitation level for lead specified in 10 CSR 60-5.010(1)(H); and

(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

(2) consecutive monitoring periods conducted pursuant to 10 CSR 60-15.070 and submits the results to the department. If any such water system after that exceeds the lead or copper action level during any monitoring period, the system (or the department, 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 department may require a system to repeat treatment steps previously completed by the system where the department determines that this is necessary to implement properly the treatment requirements of this section. The department shall notify the system in writing of the determination and explain the basis for its decision.

AUTHORITY: section 640.100, RSMo (Cum. Supp. 1989). Original rule filed Aug. 4, 1992, effective May 6, 1993.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989.*

10 CSR 60-15.030 Description of Corrosion Control Treatment Requirements

PURPOSE: This rule describes the corrosion control treatment requirements which are applicable to all water systems under 10 CSR 60-15.020.

(1) Based upon the results of lead and copper tap monitoring and water quality parameter monitoring, small (serving fewer than three thousand three hundred (3300) persons) and medium-size (serving three thousand three hundred one to fifty thousand (3301—50,000) persons) water systems exceeding the lead or copper action level shall recommend installation of one (1) or more of the corrosion control treatments listed in subsection (3)(A), which the system believes constitutes optimal corrosion control for that system. The department may require the system to conduct additional water quality parameter monitoring in accordance with 10 CSR 60-15.080(2) and perform corrosion control studies as described in this rule to assist the department in reviewing the system's recommendations.

(2) The department may require any small or medium-sized systems that exceed the lead or copper action level to perform corrosion control studies under section (3) of this rule to identify optimal corrosion control treatment for the system.

(3) Performance of Corrosion Control Studies.

(A) 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:

1. Alkalinity and pH adjustment;
2. Calcium hardness adjustment; and
3. 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.

(B) 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.

(C) The water system shall measure the following water quality parameters in any tests conducted under this section before and after evaluating the corrosion control treatments listed in paragraph (3)(A)1. of this rule:

1. Lead;
2. Copper;
3. pH;
4. Alkalinity;
5. Calcium;
6. Conductivity;
7. Orthophosphate (when an inhibitor containing a phosphate compound is used);
8. Silicate (when an inhibitor containing a silicate compound is used); and
9. Water temperature.

(D) The water system shall identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment and document these constraints with at least one (1) of the following:

1. 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; or
2. 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.

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

(F) On the basis of an analysis of the data generated during each evaluation, the water system shall recommend to the department, 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 this section.

(4) Based upon consideration of available information including, where applicable, studies performed under section (3) of this rule and a system's recommended treatment alternative, the department shall either approve the corrosion control treatment option recommended by the system or designate alternative corrosion control treatment(s) from among those listed in subsection (3)(A) of this rule. When designating optimal treatment, the department shall consider the effects that additional corrosion control treatment will have on the water quality parameters and on other water quality treatment processes.

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

(6) Each system shall properly install and operate throughout its distribution system the optimal corrosion control treatment designated by the department.

(7) The department 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 department. 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 department shall designate—

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

(B) A minimum pH value measured in all tap samples. That value shall be equal to or greater than 7.0, 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;

(C) 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 form a passivating film on the interior walls of the pipes of the distribution system;

(D) 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;

(E) 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.

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

(8) All systems shall maintain water quality parameter values at or above minimum values or within ranges designated by the department under section (7) of this rule in each sample collected under 10 CSR 60-15.080(4). If the water quality parameter value of any sample is below the minimum value or outside the range designated by the department, then the system is out of compliance. As specified in 10 CSR 60-15.080(4), the system may take a confirmation sample for any water quality parameter value no later than three (3) days after the first sample. If a confirmation sample is taken, the result must be averaged with the first sampling result and the average must be used for any compliance determinations under this section. The department will have discretion to delete results of obvious sampling errors from this calculation.

(9) The department, upon its own initiative or in response to a request by a water system or other interested party, may modify its determination of the optimal corrosion control treatment or optimal water quality control parameters. 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 department may modify its determination where it concludes that the change is necessary to ensure that the system continues to optimize corrosion control treatment. A revised determination shall be made in writing, setting forth the new treatment requirements, explaining the basis for the department's decision and providing an implementation schedule for completing the treatment modifications.

AUTHORITY: section 640.100, RSMo (Cum. Supp. 1989). Original rule filed Aug. 4, 1992, effective May 6, 1993.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989.*

10 CSR 60-15.040 Source Water Treatment Requirements

PURPOSE: This rule describes the required corrosion control treatment steps for a system's source water and establishes treatment requirement deadlines.

(1) The following are deadlines for completing source water treatment steps:

(A) A system exceeding the lead or copper action level shall complete lead and copper source water monitoring under 10 CSR 60-15.090(2) and make a treatment recommendation to the department within six (6) months after exceeding the lead or copper action level;

(B) The department shall make a determination regarding source water treatment within six (6) months after submission of monitoring results under subsection (1)(A) of this rule;

(C) If the department requires installation of source water treatment, the system shall install the treatment within twenty-four (24) months after the completion of subsection (1)(B) of this rule;

(D) The system shall complete follow-up tap water monitoring and source water monitoring within thirty-six (36) months after completion of subsection (1)(B) of this rule;

(E) The department shall review the system's installation and operation of source water treatment and specify maximum permissible source water levels within six (6) months after completion of subsection (1)(D) of this rule;

(F) The system shall operate in compliance with the department-specified maximum permissible lead and copper source water levels and continue source water monitoring.

(2) Any system which exceeds the lead or copper action level shall recommend in writing to the department the installation and operation of one (1) of the source water treatments listed in the following subsections. 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:

(A) The department 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 department determines that treatment is needed, the department 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 the following: ion exchange, reverse osmosis, lime softening or coagulation/filtration. If the department requests additional information to aid in its review, the water system shall provide the information by the date specified by the department in its request. The department shall notify the system in writing of its determination and set forth the basis for its decision;

(B) Each system shall properly install and operate the source water treatment designated by the department;

(C) The department 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 department. Based upon its review, the department shall designate the maximum permissible lead and copper concentrations for finished water entering the distribution system. These levels shall reflect the contaminant removal capability of the treatment properly operated and maintained. The department shall notify the system in writing and explain the basis for its decision;

(D) Each water system shall maintain lead and copper levels below the maximum permissible concentrations designated by the department at each sampling point monitored in accordance with 10 CSR 60-15.090. The system is out of compliance if the level of lead or copper at any of the sampling points are greater than the maximum permissible concentration designated by the department; or

(E) The department, upon its own initiative or in response to a request by a water system or other interested party, may modify its determination of the source water treatment or maximum permissible lead and copper concentrations for finished water entering the distribution system. 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 department may modify its determination where it concludes that the change is necessary to ensure that the system continues to minimize lead and copper concentrations in the source water. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the department's decision and provide an implementation schedule for completing the treatment modifications.

AUTHORITY: section 640.100, RSMo (Cum. Supp. 1989). Original rule filed Aug. 4, 1992, effective May 6, 1993.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989.*

10 CSR 60-15.050 Lead Service Line Replacement Requirements

PURPOSE: This rule sets forth requirements for the removal of lead service lines if lead action levels are exceeded, and corrosion control efforts and source water treatment are unsuccessful in lowering the lead concentration levels in tap samples.

(1) Systems that fail to meet the lead action level in tap samples taken pursuant to 10 CSR 60-15.070(4)(B), after installing corrosion control, source water treatment, or both (whichever sampling occurs later), shall replace lead service lines in accordance with the requirements of this section. If a system is in violation of 10 CSR 60-15.020 or 10 CSR 60-15.040 for failure to install source water or corrosion control treatment, the department 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 10 CSR 60-15.070(4)(B) has passed.

(2) A system annually shall replace at least seven percent (7%) 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 based upon a materials evaluation, including the evaluation required under 10 CSR 60-15.070(1). The first year of lead service line replacement shall begin on the date the action level was exceeded in tap sampling referenced in section (1) of this rule.

(3) 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 10 CSR 60-15.070(2)(C), is less than or equal to 0.015 milligrams per liter (mg/l).

(4) A water system shall replace the entire service line (up to the building inlet) unless it demonstrates to the satisfaction of the department under section (5) of this rule that it controls less than the entire service line. In those cases, the system shall replace the portion of the line which the department determines is under the system's control. The system shall notify the user served by the line that the system will replace the portion of the service line under its control and shall offer to replace the building owner's portion of the line, but is not required to bear the cost of replacing the building owner's portion of the line. For buildings where only a portion of the lead service line is replaced, the water system shall inform the resident(s) that the system will collect a first flush tap water sample after partial replacement of the service line is completed if the resident(s) so desires. In cases where the resident(s) accepts the offer, the system shall collect the sample and report the results to the resident(s) within fourteen (14) days following partial lead service line replacement.

(5) A water system is presumed to control the entire lead service line (up to the building inlet) unless the system demonstrates to the satisfaction of the department, in a letter submitted under 10 CSR 60-7.020(5)(D), that it does not have any of the following forms of control over the entire line (as defined by Missouri statutes, municipal ordinances, public service contracts or other applicable legal authority): authority to set standards for construction, repair or maintenance of the line; authority to replace, repair or maintain the service line; or ownership of the service line. The department shall review the information supplied by the system and determine whether the system controls less than the entire service line and, in those cases, shall determine the extent of the system's control. The department's determination shall be in writing and explain the basis for its decision.

(6) The department shall require a system to replace lead service lines on a shorter time 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 department shall make this determination in writing and notify the system of its finding within six (6) months after the system is triggered into lead service line replacement based on monitoring referenced in section (1) of this rule.

(7) Any system may cease replacing lead service lines whenever first-draw tap samples collected pursuant to 10 CSR 60-15.070(4)(C) meet the lead action level during each of two (2) consecutive monitoring periods and the system submits the results to the department. If the first-draw tap samples in any such water system after that exceed the lead action level, the system shall recommence replacing lead service lines, pursuant to section (2) of this rule.

(8) To demonstrate compliance with sections (1)—(4) of this rule, a system shall report to the department the information specified in 10 CSR 60-7.020(5).

AUTHORITY: section 640.100, RSMo (Cum. Supp. 1989). Original rule filed Aug. 4, 1992, effective May 6, 1993.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989.*

10 CSR 60-15.060 Public Education and Supplemental Monitoring Requirements

PURPOSE: This rule sets forth the content and mode of delivery of written and broadcast materials to be used by water systems when action levels have been exceeded. It also addresses supplemental monitoring and notification of results for any customer who requests that monitoring.

(1) Content of Written Materials. A water system shall include the following text in all of the printed materials it distributes through its lead public education program. Any additional information presented by a system shall be consistent with the information in this rule and be in plain English that can be understood by laypersons. A water system that exceeds the lead action level based on tap water samples collected in accordance with 10 CSR 60-15.070 shall deliver the public education materials contained in sections (1) and (2) of this rule in accordance with the requirements in section (3) of this rule:

(A) Introduction. "The Missouri Department of Natural Resources (DNR) 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 DNR action level of fifteen parts per billion (15 ppb) or 0.015 milligrams of lead per liter of water (mg/l). Under federal and state 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 each lead service line that we control if the line contributes lead concentrations of more than fifteen (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 rule 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, brass fixtures 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;"

(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 DNR estimates that drinking water can make up twenty percent (20%) 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. It is also rare in groundwater, even in Missouri's lead belt. 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 two-tenths percent (0.2%) lead and restricted the lead content of faucets, pipes and other plumbing materials to eight percent (8.0%). Missouri rule 10 CSR 60-10.040 reads: 'As of January 1, 1989, all materials used in the construction, expansion, modification or improvement of a public water system or customer water system shall be lead-free. This does not apply to leaded joints necessary for the repair of cast iron pipes. In addition, any customer water system constructed, expanded, modified or repaired after January 1, 1989, that is connected to a public water system and later is found to contain materials that are not lead-free, shall have the water meter removed or otherwise have the service line severed from the public water system when the supplier of water is so ordered by the appropriate local government authority (if one exists) or by the department. This requirement does not apply to any customer water system previously served by a water system other than a public water system.'

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;" and

(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 fifteen (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 (6) 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 fifteen to thirty (15—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 (1) 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 (1) or two (2) gallons of water and costs less than (*insert a cost estimate based on flushing two (2) times a day for thirty (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 three to five (3—5) minutes. After that, 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 1989, notify the plumber who did the work and request that s/he 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 Public Drinking Water Program of the Missouri Department of Natural Resources at (800) 334-6946 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 city's record of building

permits which should be maintained in the files of the (*insert name of department that issues building permits*). A licensed plumber at the same time can 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 fifteen (15) ppb to drinking water, after our comprehensive treatment program is in place, we are required to replace the line. If the line is only partially controlled by the (*insert name of the city, county or water system that controls the line*), we are required to provide you with information on how to replace your portion of the service line, and offer to replace that portion of the line at your expense and take a follow-up tap water sample within fourteen (14) days of the replacement. Acceptable replacement alternatives include copper, steel, iron and plastic pipes; and

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 in subparagraphs (1)(D)2.A.—F. 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 fifteen (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. 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; and

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 DNR 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. "The Missouri Department of Health at (800) 392-7245 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 (2) laboratories*)."

(2) Content of Broadcast Materials. A water 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:

(A) "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 $ 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; and

(B) 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*)."

(3) Delivery of a Public Education Program.

(A) 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).

(B) A community water system that fails to meet the lead action level on the basis of tap water samples collected in accordance with 10 CSR 60-15.070, within sixty (60) days shall—

1. Insert notices in each customer's water utility bill containing the information in section (1) of this rule, 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";

2. Submit the information in section (1) of this rule to the editorial departments of the major daily and weekly newspapers circulated throughout the community;

3. Deliver pamphlets or brochures, or both, that contain the public education materials in subsections (1)(B) and (D) of this rule to facilities and organizations, including the following:

A. Public schools or local school boards, or both;

B. City or county health department;

C. Women, Infants and Children (WIC), Head Start Program(s), or both, whenever available;

D. Public and private hospitals or clinics, or both;

E. Pediatricians;

F. Family planning clinics;

G. Local welfare agencies; and

4. Submit the public service announcement in section (2) of this rule to at least five (5) of the radio and television stations with the largest audiences that broadcast to the community served by the water system.

(C) A community water system shall repeat the tasks contained in paragraphs (3)(B)1.—3. of this rule every twelve (12) months and the tasks contained in paragraph (3)(B)4. of this rule every six (6) months for as long as the system exceeds the lead action level.

(D) Within sixty (60) days after it exceeds the lead action level, a nontransient noncommunity water system shall deliver the public education materials contained in subsections (1)(A), (B) and (D) of this rule as follows:

1. 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

2. Distribute informational pamphlets, brochures, or both, on lead in drinking water to each person served by the nontransient noncommunity water system.

(E) A nontransient noncommunity water system shall repeat the tasks contained in subsection (3)(D) of this rule at least once during every twelve (12) months in which the system exceeds the lead action level.

(F) A water system may discontinue delivery of public education materials if the system has met the lead action level during the most recent six (6)-month monitoring period conducted pursuant to 10 CSR 60-15.070. Such a system shall recommence public education in accordance with this section if it subsequently exceeds the lead action level during any monitoring period.

(4) 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 10 CSR 60-15.070 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.

AUTHORITY: section 640.100, RSMo (Cum. Supp. 1989). Original rule filed Aug. 4, 1992, effective May 6, 1993.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989.*

10 CSR 60-15.070 Monitoring Requirements for Lead and Copper in Tap Water

PURPOSE: This rule establishes the monitoring requirements which are applicable to lead and copper in drinking water.

(1) Sample Site Location. A water system shall use the information on lead, copper and galvanized steel that it is required to collect under this section when conducting a materials evaluation. When an evaluation of the information collected pursuant to this section is insufficient to locate the requisite number of lead and copper sampling sites that meet the targeting criteria in subsection (1)(A) of this rule, the water system shall review the sources of information listed in this rule in order to identify a sufficient number of sampling sites. In addition, the system shall seek to collect that information where possible in the course of its normal operations (for example, checking service line materials when reading water meters or performing maintenance activities); 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; 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 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.

(A) By the applicable date for commencement of monitoring under subsection (4)(A) of this rule, 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 section (3) of this rule. 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.

(B) Community water supply systems shall identify whether the following construction materials are present in their distribution system:

1. Lead from piping, solder caulking, interior lining of distribution mains, alloys and home plumbing;
2. Copper from piping and alloys, service lines and home plumbing;
3. Ferrous piping materials, such as cast iron and steel;
4. Asbestos cement pipe;
5. Vinyl-lined asbestos cement pipe; and
6. Coal tar-lined pipes and tanks.

(C) The sampling sites selected for a community water system's sampling pool (tier 1 sampling sites) shall consist of single-family structures that contain copper pipes with lead solder installed after 1982, or contain lead pipes, or are served by a lead service line, or a combination of these. When multiple-family residences comprise at least twenty percent (20%) of the structures served by a water system, the system may include these types of structures in its sampling pool.

(D) 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 contain copper pipes with lead solder installed after 1982, or contain lead pipes, or are served by a lead service line, or a combination of these.

(E) 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.

(F) The sampling sites selected for a nontransient noncommunity water system (tier 1 sampling sites) shall consist of buildings that contain copper pipes with lead solder installed after 1982, or contain lead pipes, or are served by a lead service line, or a combination of these.

(G) A nontransient noncommunity water system with insufficient tier 1 sites that meet the targeting criteria in subsection (1)(F) of this rule shall complete its sampling pool with sampling sites that contain copper pipes with lead solder installed before 1983.

(H) Any water system whose sampling pool does not consist exclusively of tier 1 sites shall demonstrate in a letter submitted to the department under 10 CSR 60-7.020(1)(B) why a review of the information listed in subsection (1)(B) of this rule was inadequate to locate a sufficient number of tier 1 sites. Any community water system which includes tier 3 sampling sites in its sampling pool shall demonstrate in a letter why it was unable to locate a sufficient number of tier 1 and tier 2 sampling sites.

(I) Any water system whose distribution system contains lead service lines shall draw fifty percent (50%) of the samples it collects during each monitoring period from sites that contain lead pipes or copper pipes with lead solder and fifty percent (50%) of those 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 demonstrate in a letter submitted to the department under 10 CSR 60-7.020(1)(D) why the system was unable to locate a sufficient number of these sites. This water system shall collect first-draw samples from all of the sites identified as being served by these lines.

(2) Sample Collection Methods.

(A) All tap samples for lead and copper collected in accordance with this rule, with the exception of lead service line samples collected under 10 CSR 60-15.050(3), shall be first-draw samples.

(B) Each first-draw tap sample for lead and copper shall be one liter (1 l) in volume and have stood motionless in the plumbing system of each sampling site for at least six (6) 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 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 section. To avoid problems of residents handling nitric acid, acidification of first-draw samples may be done in the laboratory up to fourteen (14) days after the sample is collected. If the sample is not acidified immediately after collection, then the sample must stand in the original container for at least twenty-eight (28) hours after acidification. 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) Each service line sample shall be one (1) liter in volume and have stood motionless in the lead service line for at least six (6) hours. Lead service line samples shall be collected in one (1) of the following three (3) ways:

1. 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;

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 significant change in temperature which would be indicative of water that has been standing in the lead service line.

(D) 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.

(3) Water systems shall collect at least one (1) sample during each monitoring period specified in section (4) from the number of sites listed in the first column following (standard monitoring). A system conducting reduced monitoring under subsection (4)(D) may collect one (1) sample from the number of sites specified in the second column during each monitoring period specified in subsection (4)(D).

System Size (# People Served)	# of sites (Standard Monitoring)	# of sites (Reduced Monitoring)
>100,000	100	50
10,001–100,000	60	30
3301–10,000	40	20
501– 3300	20	10
101–500	10	5
≤100	5	5

(4) Timing of Monitoring.

(A) Initial Tap Sampling. The first six (6)-month monitoring period for small (serving less than or equal to three thousand three hundred (3300) persons), medium-size (serving three thousand three hundred one to fifty thousand (3301–50,000) persons) and large (serving more than fifty thousand (>50,000) persons) systems shall begin on the following dates:

System Size (# People Served)	First Six (6)-Month Monitoring Period Begins On
>50,000	January 1, 1992
3301–50,000	July 1, 1992
≤3300	July 1, 1993

1. All large systems shall monitor during two (2) consecutive six (6)-month periods.

2. All small and medium-size systems shall monitor during each six (6)-month monitoring period until the system—

A. Exceeds the lead or copper action level and is therefore required to implement the corrosion control treatment requirements under 10 CSR 60-15.020, in which case the system shall continue monitoring in accordance with subsection (4)(B) of this rule; or

B. Meets the lead and copper action levels during two (2) consecutive six (6)-month monitoring periods, in which case the system may reduce monitoring in accordance with subsection (4)(D) of this rule.

(B) Monitoring After Installation of Corrosion Control and Source Water Treatment.

1. Any large system which installs optimal corrosion control treatment pursuant to 10 CSR 60-15.020(1)(A)4. shall monitor during two (2) consecutive six (6)-month monitoring periods by the date specified in 10 CSR 60-15.020(1)(A)5.

2. Any small or medium-size system which installs optimal corrosion control treatment pursuant to 10 CSR 60-15.020(2)(A)5. shall monitor during two (2) consecutive six (6)-month monitoring periods by the date specified in 10 CSR 60-15.020(2)(A)6.

3. Any system which installs source water treatment pursuant to 10 CSR 60-15.040(1)(C) shall monitor during two (2) consecutive six (6)-month monitoring periods by the date specified in 10 CSR 60-15.040(1)(D).

(C) After the department specifies the values for water quality control parameters under 10 CSR 60-15.030(6), the system shall monitor during each subsequent six (6)-month monitoring period, with the first monitoring period to begin on the date the department specifies the optimal values under 10 CSR 60-15.030(6).

(D) Reduced Monitoring.

1. A small or medium-size water system that meets the lead and copper action levels during each of two (2) consecutive six (6)-month monitoring periods may reduce the number of samples in accordance with section (3) of this rule and reduce the frequency of sampling to once per year.

2. Any water system that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the state under 10 CSR 60-15.030(6) during each of two (2) consecutive six (6)-month monitoring periods may request that the department allow the system to reduce the frequency of monitoring to once per year and to reduce the number of lead and copper samples in accordance with section (3) of this rule. The department shall review the information submitted by the water system and shall make its decision in writing, setting forth the basis for its determination. The department 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.

3. A small or medium-size water system that meets the lead and copper action levels during three (3) consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three (3) years. Any water system that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the department under 10 CSR 60-15.030(6) during three (3) consecutive years of monitoring may request that the department allow the system to reduce the frequency of monitoring from annually to once every three (3) years. The department shall review the information submitted by the water system and shall make its decision in writing, setting forth the basis for its determination. The department 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.

4. A water system that reduces the number and frequency of sampling shall collect these samples from sites included in the pool of targeted sampling sites identified in section (1) of this rule. Systems sampling annually or less frequently shall conduct the lead and copper tap sampling during the months of June, July, August or September.

5. 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 subsection (4)(C) of this rule and collect the number of samples specified for standard monitoring under section (3) of this rule. This system also shall conduct water quality parameter monitoring in accordance with 10 CSR 60-15.080(2),(3) or (4) (as appropriate) during the monitoring period in which it exceeded the action level. Any water system subject to reduced monitoring frequency that fails to operate within the range of values for the water quality control parameters specified by the department under 10 CSR 60-15.030(6) shall resume tap water sampling in accordance with subsection (4)(C) of this rule and collect the number of samples specified for standard monitoring under section (3) of this rule.

(5) The results of any monitoring conducted, in addition to the minimum requirements of this section, shall be considered by the system and the department in making any determinations (that is, calculating the ninetieth percentile lead or copper level) under this rule.

AUTHORITY: section 640.100, RSMo (1994). Original rule filed Aug. 4, 1992, effective May 6, 1993. Amended: Filed Feb. 1, 1996, effective Oct. 30, 1996.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989, 1992, 1993, 1995.*

10 CSR 60-15.080 Monitoring Requirements for Water Quality Parameters

PURPOSE: This rule sets forth the procedures and requirements for monitoring drinking water to determine how corrosive the water is to the distribution system.

(1) General Requirements. All large (serving more than fifty thousand (>50,000) persons) water systems, all small (serving less than or equal to three thousand three hundred (≤3300) persons) and medium-size (serving three thousand three hundred one to fifty thousand (3301–50,000) persons) systems that exceed the lead or copper action level shall monitor water quality parameters in addition to lead and copper in accordance with this rule. The requirements of this rule are summarized in the table at the end of this rule.

(A) Sample Collection Methods.

1. 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 rule is not required to be conducted at taps targeted for lead and copper sampling under 10 CSR 60-15.070(1). (Note: Systems may find it convenient to conduct tap sampling for water quality parameters at sites used for coliform sampling under 10 CSR 60-4.020(1)(A).)

2. 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 (1) 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 (that is, when water is representative of all sources being used).

(B) Number of Samples.

1. Systems shall collect two (2) tap samples for applicable water quality parameters during each monitoring period specified under sections (2)–(5) of this rule from the following number of sites:

System Size (# People Served)	Sites for Water Quality Parameters Number
>100,000	25
10,001–100,000	10
3301–10,000	3
501–3300	2
101–500	1
≤100	1

2. Systems shall collect two (2) samples for each applicable water quality parameter at each entry point to the distribution system during each monitoring period specified in section (2) of this rule. During each monitoring period specified in sections (3)–(5) of this rule, systems shall collect one (1) sample for each applicable water quality parameter at each entry point to the distribution system.

(2) Initial Sampling. All large (serving more than fifty-thousand (>50,000) persons) water systems shall measure the applicable water quality parameters as specified in this rule at taps and at each entry point to the distribution system during each six (6)-month monitoring period specified in 10 CSR 60-15.070(4)(A). All small (serving less than or equal to three thousand three hundred (≤3300) persons) and medium-size (serving three thousand three hundred one to fifty thousand (3301–50,000) persons) systems shall measure the applicable water quality parameters at the locations specified as follows during each six (6)-month monitoring period specified in 10 CSR 60-15.070(4)1. during which the system exceeds the lead or copper action level:

(A) At taps—

1. pH;
2. Alkalinity;
3. Orthophosphate, when an inhibitor containing a phosphate compound is used;
4. Silica, when an inhibitor containing a silicate compound is used;
5. Calcium;
6. Conductivity; and
7. Water temperature; and

(B) At each entry point to the distribution system, all of the applicable parameters listed in subsection (2)(A) of this rule.

(3) Monitoring After Installation of Corrosion Control. Any large system which installs optimal corrosion control treatment pursuant to 10 CSR 60-15.020(1)(A)4. shall measure the water quality parameters at the locations and frequencies specified in this section during each six (6)-month monitoring period specified in 10 CSR 60-15.070(4)(B)1. Any small or medium-size system which installs optimal corrosion control treatment shall conduct monitoring during each six (6)-month monitoring period as specified in 10 CSR 60-15.070(4)(B)2. in which the system exceeds the lead or copper action level.

(A) At taps, two (2) samples for—

1. pH;
2. Alkalinity;
3. Orthophosphate, when an inhibitor containing a phosphate compound is used;
4. Silica, when an inhibitor containing a silicate compound is used; and
5. Calcium, when calcium carbonate stabilization is used as part of corrosion control.

(B) At each entry point to the distribution system, one (1) sample every two (2) weeks (bi-weekly)—

1. For pH;
2. 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
3. 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).

(4) Monitoring After Department Specifies Water Quality Parameter Values For Optimal Corrosion Control. After the department specifies the values for applicable water quality control parameters reflecting optimal

corrosion control treatment under 10 CSR 60-15.030(6), all large (serving more than fifty thousand (>50,000) persons) systems shall measure the applicable water quality parameters in accordance with section (3) of this rule during each monitoring period specified in 10 CSR 60-15.070(4)(C). Any small (serving less than three thousand three hundred (<3300) persons) or medium-size (serving three thousand three hundred one to fifty thousand (3301–50,000) persons) system shall conduct monitoring during each monitoring period specified in 10 CSR 60-15.070(4)(C) in which the system exceeds the lead or copper action level. The system may take a confirmation sample for any water quality parameter value no later than three (3) days after the first sample. If a confirmation sample is taken, the result must be averaged with the first sampling result and the average must be used for any compliance determinations under 10 CSR 60-15.030(7). The department has the discretion to delete results of obvious sampling errors from this calculation.

(5) Reduced Monitoring.

(A) Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment during each of two (2) consecutive six (6)-month monitoring periods under section (4) of this rule shall continue monitoring at the entry point(s) to the distribution system as specified in subsection (3)(B) of this rule. That system may collect two (2) tap samples for applicable water quality parameters from the following reduced number of sites during each six (6)-month monitoring period.

System Size (# People served)	Sites for Water Quality Parameters Reduced Number
>100,000	10
10,001–100,000	7
3301–10,000	3
501–3300	2
101–500	1
≤100	1

(B) Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the department under 10 CSR 60-15.030(6) during three (3) consecutive years of annual monitoring under this subsection may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in subsection (5)(A) of this rule from annually to every three (3) years.

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

(D) Any water system subject to reduced monitoring frequency that fails to operate within the range of values for the water quality parameters specified by the department under 10 CSR 60-15.030(6) shall resume tap water sampling in accordance with the number and frequency requirements in section (3) of this rule.

(6) Additional Monitoring by Systems. The results of any monitoring conducted in addition to the minimum requirements of this rule shall be considered by the system and the department in making any determinations (that is, determining concentrations of water quality parameters) under this rule or 10 CSR 60-15.030.

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 the distribution	Every 6 months system
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	Biweekly
After department 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 the distribution system	Biweekly
Reduced Monitoring	pH, alkalinity, orthophosphate or silica[3], calcium[4]	Taps	Every 6 months at a 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 the distribution system	Biweekly

[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.

AUTHORITY: section 640.100, RSMo (1994). Original rule filed Aug. 4, 1992, effective May 6, 1993. Amended: Filed Feb. 1, 1996, effective Oct. 30, 1996.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989, 1992, 1993, 1995.*

10 CSR 60-15.090 Monitoring Requirements for Lead and Copper in Source Water

PURPOSE: This rule establishes monitoring requirements for lead and copper in source waters.

(1) Sample Location, Collection Methods and Number of Samples.

(A) A water system that fails to meet the lead or copper action level on the basis of tap samples collected in accordance with 10 CSR 60-15.070 shall collect lead and copper source water samples in accordance with the requirements regarding sample location, number of samples and collection methods specified in 10 CSR 60-4.030 (inorganic chemical sampling).

(B) Where the results of sampling indicate an exceedance of maximum permissible source water levels established under 10 CSR 60-5.040(2)(D), the department may require that one (1) additional sample be collected as soon as possible after the initial sample was taken (but not to exceed two (2) weeks) at the same sampling point. If the department-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 maximum permissible levels. Any sample value below the detection limit shall be considered to be zero (0). Any value above the detection limit but below the practical quantification level (PQL) shall be as the measured value or be considered one-half (1/2) PQL.

(2) 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 (1) source water sample from each entry point to the distribution system within six (6) months after the exceedance.

(3) Monitoring Frequency After Installation of Source Water Treatment. Any system which installs source water treatment pursuant to 10 CSR 60-15.040 shall collect an additional source water sample from each entry point to the distribution system during two (2) consecutive six (6)-month monitoring periods by the deadline specified in 10 CSR 60-15.040(1)(D).

(4) Monitoring Frequency After the Department Specifies Maximum Permissible Source Water Levels or Determines That Source Water Treatment is Not Needed.

(A) A system shall monitor at the following specified frequency in cases where the department specifies maximum permissible source water levels under 10 CSR 60-15.040(2)(D) or determines that the system is not required to install source water treatment under 10 CSR 60-15.040(2)(B):

1. A water system using only groundwater shall collect samples once during the three (3)-year compliance period in effect when the applicable department determination under subsection (4)(A) of this rule is made. Those systems shall collect samples once during each subsequent compliance period; and

2. A water system using surface water (or a combination of surface and ground water) shall collect samples once during each year, the first annual monitoring period to begin on the date on which the applicable department determination is made under subsection (4)(A) of this rule.

(B) A system is not required to conduct source water sampling for lead, copper, or both, 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 subsection (4)(A) of this rule.

(5) Reduced Monitoring Frequency.

(A) A water system using only groundwater which demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead or copper concentrations, or both, specified by the department during at least three (3) consecutive compliance periods under paragraph (4)(A)1. of this rule may reduce the monitoring frequency for lead, copper, or both, to once during each nine (9)-year compliance cycle.

(B) A water system using surface water (or a combination of surface and ground waters) which demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the department for at least three (3) consecutive years may reduce the monitoring frequency in paragraph (4)(A)2. of this rule to once during each nine (9)-year compliance cycle.

(C) A water system that uses a new source of water is not eligible for reduced monitoring for lead, copper, or both, until concentrations in samples collected from the new source during three (3) consecutive monitoring periods are below the maximum permissible lead and copper concentrations.

AUTHORITY: section 640.100, RSMo (1994). Original rule filed Aug. 4, 1992, effective May 6, 1993.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989.*